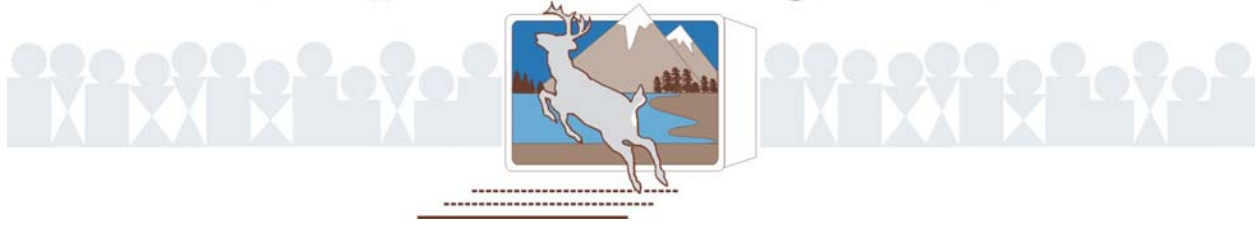


# Responsive Management



## **AN ASSESSMENT AND EVALUATION OF THE NATIONAL ARCHERY IN THE SCHOOLS PROGRAM**

### **PHASE I: INSTRUCTOR SURVEY RESULTS**

**Conducted for the National Archery in the Schools  
Program Foundation**

**by Responsive Management  
in cooperation with Hilarie Davis, Ed.D.**

**October 2008**

**AN ASSESSMENT AND EVALUATION OF THE NATIONAL ARCHERY IN THE  
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**PHASE I: INSTRUCTOR SURVEY RESULTS**

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**Responsive Management National Office**

Mark Damian Duda, Executive Director  
Tom Beppler, Research Associate  
Steven J. Bissell, Ph.D., Qualitative Research Associate  
Andrea Criscione, Research Associate  
James B. Herrick, Ph.D., Research Associate  
Martin Jones, Senior Research Associate  
Joanne Nobile, Research Associate  
Amanda Ritchie, Research Associate  
Carol L. Schilli, Research Associate  
Megan Wilkes, Research Associate  
Tim Winegord, Survey Center Manager  
Alison Lanier, Business Manager

130 Franklin Street  
Harrisonburg, VA 22801  
Phone: 540/432-1888 Fax: 540/432-1892  
E-mail: [mark@responsivemanagement.com](mailto:mark@responsivemanagement.com)  
[www.responsivemanagement.com](http://www.responsivemanagement.com)

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*"We have a ton of kids who are never going to be baseball or football or track stars. You don't have to be strong, you don't have to be tall, you don't have to be fast— anyone can be an archer. And it's a life sport, it's something you can do until you're seventy or eighty. And I think that's huge for kids."*

~Minnesota Instructor

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## EXECUTIVE SUMMARY OF FINDINGS

Based on a questionnaire administered to a representative sample of approximately 3,932 physical education (PE) instructors from 10 of the 46 states involved in the National Archery in the Schools Program (the NASP), three hypotheses were examined: 1) learning archery is engaging to students; 2) through archery, students improve learning skills and attitudes; and 3) archery positively affects students' attendance and performance in PE and school and their interest in archery and other sports.

### Hypothesis 1: Learning Archery Is Engaging to Students

- ***Students are engaged by the NASP.*** More than half (55%) of the instructors report that students look forward to school more on days that they have archery, that the NASP course was not at all difficult (59%) for students, and that most students became good (65%) or very good (20%) at archery as a result of the course.
- ***Instructors are satisfied with the NASP.*** Ninety-three percent (93%) of the instructors report being satisfied with the NASP, rate it as effective (93%), and are satisfied with the training they received (94%). Most feel competent to teach the NASP. They see its strengths as being an affordable program, engaging to students, appropriate for different age groups, and benefiting students. Their recommendations relate to making the program even more affordable and providing additional support for replacement or repair, ongoing training for instructors, more participating schools, and more opportunities for competition.
- ***Instructors implement the NASP in different ways.*** Most instructors have been involved for at least 1 year (78%), with 13% reporting that this was their first time teaching the program. The NASP is offered as an after school club or team by 37% of the schools, as an elective in PE for 30%, as a required course in PE by 23% of the schools, and is required for all students in 17% of the schools. The NASP is most often offered as a 2-3 week course (30%) or as a 3-4 week course (16%). Thirty percent (30%) of schools offer archery more than 4 weeks a year. Twelve percent (12%) offer the NASP for an entire semester or more. Most instructors' schools have participated in the NASP for no more than 4 years (86%), while 58% have been involved for no more than 2 years. Instructors most commonly teach the NASP course to middle school grade levels, including sixth graders (52%), seventh graders (54%), and eighth graders (55%). Although 37% reported having after-school clubs in an earlier forced-choice question about how archery was taught, when asked directly about having an archery club, 50% say they have one, typically with 30 or fewer students. Schools that do not have a club cite staffing, time, and funding issues. There were no significant differences in the responses based on where instructors live, their age, or their gender.

## **Hypothesis 2: Through Archery, Students Improve Learning Skills and Attitudes**

- ***Archery improves student self-confidence.*** Eighty-four percent (84%) of instructors agree that archery has improved their students' self-confidence. When asked about specific areas of self-confidence that are affected, instructors reported that archery gives students more confidence in their relationships with their teachers (51%), with other sports or physical activities (50%) and, to a lesser extent, in friendships with other students (43%). Twenty-four percent (24%) reported that archery gives students more self-confidence in their schoolwork.
- ***Archery improves student motivation.*** Seventy-eight percent (78%) of instructors agree that archery has improved student motivation. When asked about specific areas, nearly half of all instructors (48%) say the NASP gives students more motivation to stay out of trouble and to be respectful of adults and friends. Instructors also say the NASP gives students more motivation to attend school (41%) and, to a lesser extent, to participate in other sports and activities (29%) and get good grades (26%).
- ***Archery improves student behavior.*** Most PE instructors (74%) agree that archery has improved student behavior; in a separate question asking specifically about student behavior, over half (53%) report that student behavior, as a whole, has improved because of the program. When disaggregated, instructors with more than 3 years of experience with the NASP (86% versus 68%), who taught it for more than 4 weeks (88% versus 68%), or who had an archery club at their school (82% versus 66%) were significantly more likely to agree that archery improves student behavior than instructors who did not share these characteristics. When asked how the NASP affects specific areas of student behavior, more than half of instructors (55%) say that students exhibit more on-task behaviors. Other areas in which substantial percentages of instructors report specific effects are: interpersonal relationships (45%); fewer discipline problems (43%); and students asking more questions, demonstrating confidence and interest in subjects (38%).
- ***Archery improves student attitudes.*** Seventy-three percent (73%) of instructors agree that archery has improved their students' attitudes. Instructors with more than 3 years of experience with the NASP (86% versus 66%), who taught it for more than 4 weeks (85% versus 68%), or who had an archery club at their school (84% versus 62%) were significantly more likely to agree that archery improves student attitudes.
- ***Archery improves student interpersonal relationships.*** Seventy percent (70%) of instructors agree that archery has improved their students' working relationship with the PE or archery teacher. Again, instructors with more than 3 years of experience with the NASP (80% versus 64%), who taught it for more than 4 weeks (79% versus 66%), or who had an archery club at their school (78% versus 61%) were significantly more likely to agree that archery improves student interpersonal relationships.

- ***Archery improves student concentration and focus.*** When asked specifically about student attention in archery, 76% of PE instructors believe that students pay more attention to what they are doing in NASP courses than in other classes. In another item, when given the statement, “The NASP has improved student concentration and focus,” 70% of instructors report that they agree with this statement.

### **Hypothesis 3: Archery Positively Affects Student Attendance and Performance in PE and School and Their Interest in Archery and Other Sports**

- ***The NASP has improved student academic performance in more than half of the PE classes with more intense archery programs or experienced instructors.*** When asked specifically if the NASP has affected student performance in their PE classes, 43% of instructors report that archery has improved student performance. Twenty-three percent (23%) say that performance has stayed about the same, and 34% say that they do not know. When asked if they agree with a series of statements, 53% of instructors strongly or moderately agree that the NASP has affected student performance in their PE classes. When data is disaggregated, the percentage of instructors who strongly or moderately agree that the NASP has improved student academic performance in their PE classes increases to 60% for those with more than 3 years of teaching the NASP, 69% for those who teach it for more than 4 weeks a year, and 58% for those who have after-school clubs. Seventy-one percent (71%) of instructors attribute the improvement in performance to students becoming confident that they can learn, that they learn how to focus (66%), that they learn to follow directions (66%), and that they improve their learning skills (43%).
- ***The NASP has increased attendance in half of the PE classes with more intense archery programs or experienced instructors.*** As a group, 31% of instructors say that attendance in their PE classes is better due to NASP. When asked if they agree with a series of statements, 49% of instructors strongly or moderately agree that the NASP has increased student attendance in their PE classes. When the data is disaggregated, over half of those teaching the NASP 3 or more years (59%), for those who teach more than a 4-week-long archery classes (58%), and for those who have school clubs (52%) strongly or moderately agree that the NASP has increased attendance in their PE classes. When asked why the NASP affects attendance, 59% say that students are excited to learn something new, 52% say that students feel successful learning archery so they want to learn more, and 51% say that students are interested in learning something they can do outside of school.
- ***The NASP has increased attendance in half the schools with more intense archery programs or experienced instructors.*** Twenty-one percent (21%) of instructors report that the NASP has affected attendance in school; 43% say they don’t know, and 36% say attendance has stayed the same. When asked if they agree with a series of statements, 40% of instructors strongly or moderately agree that the NASP has increased overall student attendance in their school. When the data are disaggregated by the same three implementation factors, the percentages go up to 49% for 3 or more

years of experience, 52% for more than 4 weeks of use, and 53% for schools with after-school clubs.

- ***The NASP has increased overall student academic performance in half the schools with more intense archery programs or experienced instructors.*** Twenty-four percent (24%) say that an effect of NASP is that overall student academic performance has improved; 27% say that it has remained the same, and 48% report that they do not know. When asked if they agree with a series of statements, 38% of instructors strongly or moderately agree that the NASP has improved overall academic performance in their school. Forty-seven percent (47%) of instructors with 3 or more years of experience say that overall academic performance has improved as a result of the NASP. Fifty-four (54%) of the 4-week-or-more group agree, and 56% of the after-school club group agree.
- ***The NASP has increased student interest in archery in most schools.*** Seventy-nine percent (79%) of instructors say that the NASP has increased student interest in archery.
- ***The NASP has increased student interest in hunting and shooting sports in many schools.*** Instructors say that students are more interested in hunting with a bow and arrow (56%); hunting with firearms such as a rifle or shotgun (27%); target shooting with a gun (22%); shooting BB, pellet, or air guns (19%); or shooting paintball (14%).

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*“My students thoroughly enjoy archery and the aspects of being part of that team. They don't want to miss that by being absent.”*  
~ Kentucky Instructor

*“The NASP program has given students that have not been that successful in other sports or even in school in general a chance to be successful, and be on the school team that attended the state tournament. This was a big boost in self-esteem.”*  
~ Ohio Instructor

*“NASP has enabled me to offer an activity that is very motivating and enjoyable for all, and especially the non-athletic student, and at-risk and special education students.”*  
~ Michigan Instructor

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*“The levels that we teach—third and fourth grade—it reinforces cause-and-effect for them, and it reinforces decision-making, responsibility, and accountability. They know that where that arrow goes, it’s their fault. They know that it was nobody else’s fault if they get a bulls-eye or if they miss the target. It’s total accountability.”*

~Minnesota Instructor

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## **I. INTRODUCTION AND PURPOSE OF THE STUDY**

### **Purpose**

This evaluation is being conducted for the National Archery in the Schools Program Foundation by Responsive Management to measure the effect of the National Archery in the Schools Program (NASP) on:

- 1) attendance in physical education and school in general
- 2) student performance in physical education (PE) and other subject areas
- 3) student self-confidence and performance
- 4) student, guardian, and family member interest and involvement in archery and other sports

The evaluation will be completed in two phases:

- Phase 1: Instructor observations and perceptions of the effect of the NASP
- Phase 2: A quasi-experimental study comparing students who have participated in the NASP with those who have not taken archery

This report discusses the results of Phase I of the study, the survey administered to NASP instructors. Responsive Management conducted the survey in August-September 2008 and obtained a total of 408 completed surveys.

The NASP is in 46 states. Ten states volunteered to work with schools to participate in the study. The participating states are Alabama, Arizona, Arkansas, Florida, Georgia, Indiana, Kentucky, Michigan, Minnesota, and Ohio.

Three hypotheses are being examined:

- 1) Learning archery is engaging to students
- 2) Through archery, students improve learning skills (focus and concentrate, work with teacher and others) and attitudes (motivation, behavior, confidence)
- 3) Archery positively affects students' attendance and performance in PE and school, and their interest in archery and other sports

## **Background**

The NASP is a joint venture of state departments of education, state fish and wildlife agencies, and several archery equipment manufacturers and organizations with a dual mission of promoting student education and lifelong interest/participation in the sport of archery. The program was developed to provide international-style target archery training through a standardized education package that can be directly incorporated into a school's PE curriculum. Since its inception, the NASP has been adopted in more than 46 states; implemented in over 4,700 schools; and has generated interest in 29 international cities, provinces, and countries. These include Manitoba, Saskatchewan, British Columbia, Alberta, New Brunswick, Nova Scotia, Ontario, Quebec, Spain, UK, Ireland, Morocco, Iraq, Japan, Mexico, Finland, Australia, S.Africa, N. Zealand, Switzerland, Denmark, Guam, Thailand, Netherlands, Barbados, Virgin Islands, Puerto Rico, and France.

### ***Impact of Physical Activity on Determinants Related to Academic Performance***

The impact of sports participation, physical activity, and PE in a student's overall academic experience has been hotly contested during the past several years as limited funding and increased demand to meet scholastic standards strain educational budgets. As a result, it is important to assess a program's impact on overall student performance and achievements to determine whether it is meeting its intended objectives. As Masurier and Corbin (2006) explain, "Quality physical education provides students with many real-world skills in addition to providing regular physical activity in the school day. Among the most important of these skills are self-management skills that help youths adopt healthy living practices and manage their day-to-day activities" (p. 47).

The purpose of this study is to produce a baseline understanding of program outcomes by determining the NASP's effect on improving student attendance in physical education or school in general; its impact on student performance in physical education and other subject areas; its influence on student self-esteem and achievements; and its effectiveness in increasing student, guardian, and family member interest and involvement in archery.

Numerous studies offer extensive evidence of a significant correlation between physical activities and overall academic performance, including higher scores on standardized tests (Ahamed et al., 2007; Shephard et al., 1984), higher grades or GPAs (California Department of Education, 2003; Coe, Pivarnik, Womack, Reeves, & Malina, 2006; Field, Diego, & Sanders, 2001; Williams, 1988), and better performance in school (Dwyer, Sallis, Blizzard, Lazarus, & Dean, 2001). While many of these studies note that a causal relationship is indeterminable, it is clear that a significant relationship between physical activity and academic performance exists and that participation in physical activities can be linked to improved academic performance.

In addition to studies exploring the impact of physical activity on pedagogical measurements, many studies consider the influence of physical activity on more subjective determinants of academic performance (learning skills), including attitudes

and behavior, self-esteem/self-efficacy, concentration and cognition, and personal relationships. In a study of student participation in school sports and its relationship with student behavior, Harrison and Narayan (2003) suggest that students involved in sports or other extracurricular activities were more likely to demonstrate healthy behaviors, including fitness and exercise, better self-image, decreased tendency toward emotional distress, and significantly lower odds of substance abuse and participation in illegal activities. There have also been several studies that examine the effects of exercise on individuals with mental, emotional, and behavioral problems (Allison, Faith, & Franklin, 1995; Bosscher, 1993; Evans, Evans, Schmid, & Penneypacker, 1985). In addition to the impact that physical activity has on GPA, Field, Diego, and Sanders (2001) also suggest that students with better exercise habits demonstrate higher levels of intimacy with their parents.

Research also suggests that participation in physical activities is positively associated with a student's self-esteem and emotional well-being (Frost & McKelvie, 2005; Nelson & Gordon-Larsen, 2006; Tremblay, Inman, & Willms, 2000; Yu, Chan, Cheng, Sung, & Hau, 2006), self-concept and/or body image (Alfermann & Stoll, 2000; Hausenblas & Symons Downs, 2001; Kirkcaldy, Shephard, & Siefen, 2002), and sense of belonging and school connectedness (Brown & Evans, 2002). There also appears to be a significant link between physical activity and improved concentration and cognition (Caterino & Polak, 1999; McNaughten & Gabbard, 1993; Sibley & Etnier, 2003; Tomporowski, 2003).

Further research evinces the importance of physical activities to self-regulation and self-efficacy. Self-regulation in physical education has long been the subject of research and touted as an important component in successful athletic sports and physical education curricula. According to Davis and Davey (2006), "[e]ffective self-regulation requires that students have clear goals, observe themselves, judge their progress as they go and hold positive beliefs about their capabilities, the value of learning, the factors influencing learning, and the anticipated outcomes (called self-efficacy) throughout the learning process" (p. 1). Due to the strategic approach taken in sport activities and the directed aim to reach a particular goal, the practice of self-regulation is particularly advantageous in sport participation and physical activities. Studies have shown that self-regulation and self-monitoring appear to impact sport confidence (Vealey, Hayashi, Garner-Holman, & Giacobbi, 1998); perception of mastery and success (Kim, 1999; Kim & Cho, 1996); and increased skill performance in a number of sports, including golf (Beauchamp, Halliwell, Fournier, & Koestner, 1996; Kirshenbaum & Bale, 1984), soccer (Brunelle, Janelle, & Tennant, 1999), and swimming (Anshel & Porter, 1996; Bell & Patterson, 1978). Prapavessis, Grove, McNair, and Cable (1992) completed a case study of the effects of self-regulation on a small-bore rifle shooter to explore whether self-regulation techniques would result in a reduction in anxiety. In addition to having a positive effect on anxiety reduction, the findings also suggest that these techniques increased self-confidence and performance. Although these are subjective determinants of performance as a whole, it is clear that these factors have an impact on skill levels, perceived abilities, and information processing, all of which impact student achievement. Do these results translate to the specific sport of archery or archery as a curriculum in the PE classroom? And, even more

importantly, are the skills learned in archery transferable to other subjects/areas of learning?

### ***Impact of Target Sports on Academic Performance***

Although the research on physical activity and participation in sports is abundant, in general, a review of studies related to target sports is somewhat limited. In a study of outdoor activities, including archery, Dismore and Bailey (2005) suggest that adventurous outdoor activities impact academics through intellectual and social development. Similar to the current study, this project involved an in-depth study of nine schools and over 600 students to measure the impact of the “I Can!” program on student learning. Another particularly relevant study of students participating in dart throwing implies that when students engage in self-regulation and strategic goal setting, they are more apt to attribute failure to inadequate strategies rather than an intrinsic lack of ability or effort (Kitsantas, 1997). Further, these students appeared to exhibit higher levels of self-efficacy, motor skills, and satisfaction with their performance. In a study of elementary and junior high school athletic training and its relationship to academic performance, Ou (2003) observes that students in Taiwan participating in archery appear to perform better in art and music than students enrolled in other specific physical activities.

Responsive Management (2005) conducted a study commissioned by the Archery Trade Association to help assess the NASP in Kentucky and the effect the program has on student attitudes toward and participation in archery and bowhunting. Specifically, this study examined student participation in archery and bowhunting prior to implementation of the NASP and assessed the impact following program completion to determine if there was an increase in interest and participation. The results of this study were based on self-reported reactions to the program and its effect on student behavior. Responsive Management obtained 1,494 completed questionnaires. The results of this program assessment in Kentucky schools indicate that students enjoy the course, that the course has a positive impact on student self-esteem and sense of accomplishment, and that the course results in better bow and arrow shooting skills and a subsequent increase in interest and participation. Students like the course and consider the course to be exciting. They often said the course made physical education class and school better. The course had a positive effect on students’ self-esteem—a majority said that they felt very good about themselves while taking the course, and a majority said that they felt better about themselves upon finishing the course. The course also gave students a sense of accomplishment, as a majority reported that they got a lot better at shooting a bow and arrow while taking the course. Although the previous study did not assess effects on specific academic measurements (i.e., GPA, grades, and standardized test scores), results suggest that the program had an impact on student self-esteem and confidence.

Based on a review of the literature and past research, researchers seek to explore how the NASP fits into the larger context of sports activities and its effect on academic performance. In keeping with trends in research regarding sports participation and academic performance, researchers hypothesize that the NASP will have an overall

positive effect on the overall scholastic performance and achievement of students. Specifically, we hypothesize that learning archery is engaging to students; that through archery, students improve learning skills and attitudes; and that archery positively affects students' attendance and performance in PE and school, as well as their interest in archery and other sports.

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*“Discipline and concentration are hard skills for some to master and participation in a program that requires this and yet is fun could help increase performance in all areas.”*  
~ Arizona Instructor

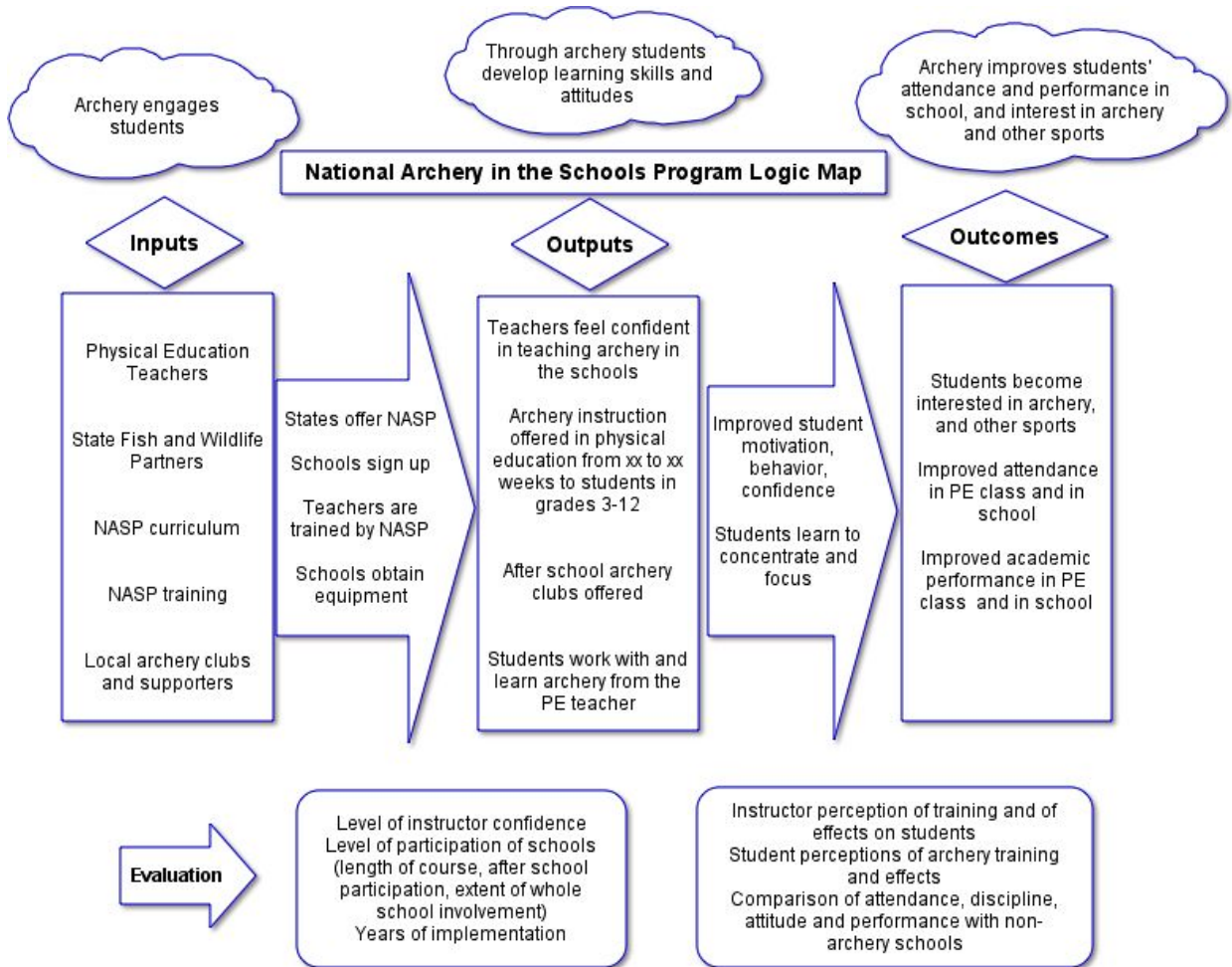
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## II. DESIGN AND METHODS

To examine the hypotheses, teacher and students are being asked to reflect on the degree to which archery is engaging, to what extent learning archery affects students' learning skills and how success in archery affects students' behavior, motivation, self-confidence, attitudes, attendance, and performance in school. These data are being triangulated to draw conclusions about the effects of archery under different conditions of implementation. These results will be compared with surveys of students not involved in archery as a control group with students who have taken archery.

### *Logic Model*

Based on focus groups and a prior review of the NASP, a logic model was developed to show the intended inputs, outputs, and outcomes of the NASP and the evaluation methods used to examine the relationships.



The instructor survey was designed to examine the variables in the hypotheses, specifically:

Inputs: The relationship of the conditions of implementation to the perceived effects:

- Nature of implementation
- Teacher satisfaction
- Teacher demographics
- Student engagement with archery

Outputs: The learning skills and attitudes students practice during archery

- Develop learning skills (focus, concentration)
- Improve student attitudes (motivation, behavior, and self-confidence)

Outcomes: The effects of learning archery on students

- Improve attendance in PE
- Improve student performance in PE
- Improve attendance at school
- Improve student performance in school
- Increase student interest/involvement in archery
- Increase student interest in other sports

Responsive Management began with two focus groups of students and instructors in Minnesota and Georgia, the purpose of which was to inform survey design and development. Content validity was established through a review of the literature on self-regulation and motivation. Construct validity was established through a review of the surveys by education experts.

The following Table of Specifications shows the questions designed for each variable. The sole data source for these questions is the Instructor Survey administered to 408 instructors in 10 districts.

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*“Every student can succeed, [whether they are] athletic or not. Following directions, listening, concentrating, patterning, joyful physical activity are all essential school skills that are taught directly as a part of the NASP.”*

~ Michigan Instructor

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**Table 1. Specifications**

<b>Inputs: The Relationship of the Conditions of Implementation to the Perceived Effects</b>	
<b>Variable</b>	<b>Applicable Items</b>
Student engagement with archery	<p>In your opinion, did students appear to look forward to going to school more, about the same, or less on the days they attended archery? (more, same, less, don't know)</p> <p>How difficult was the NASP archery course for your students as a whole? (very, somewhat, not at all, don't know)</p> <p>Overall, how would you rate the archery skills of your students as a whole? (very good, good, not very good, don't know)</p>
Teacher satisfaction	<p>How would you rate your overall satisfaction with the NASP? (very satisfied, somewhat satisfied, neither satisfied or dissatisfied, somewhat dissatisfied, very dissatisfied, don't know)</p> <p>How effective is the archery program? (very, somewhat, not at all, don't know)</p> <p>Do you agree or disagree that you were adequately prepared to teach archery to students based on your training? (strongly agree, moderately agree, neither agree or disagree, moderately disagree, strongly disagree, don't know)</p> <p>On a scale of 0-10, with 0 being incompetent and 10 being extremely competent, please rate your competency in teaching the NASP archery course.</p> <p>Based on your overall impression of the program and its affect on your students, please identify the strengths of the NASP.</p> <p>Based on your overall impression of the program and its effect on your students, please offer any recommendations you have for improving the NASP.</p>
Nature of implementation	<p>How long have you been teaching archery in school?</p> <p>Is the NASP a required course as a part of the PE curriculum at your school?</p> <p>How long is the NASP taught in your PE curriculum?</p> <p>Approximately how many students are enrolled in the NASP archery course at one time?</p> <p>Approximately how many students have participated in the NASP during the past 3 years?</p>

	<p>During what season(s) do you offer the NASP archery in your school?</p> <p>How many years has the school participated in the NASP?</p> <p>In which grade levels do you teach the NASP archery course in your school?</p> <p>Does your school have an after-school NASP archery team or club?</p> <p>Approximately how many students belong to the NASP archery team or club each year?</p> <p>Please explain why your school does not offer a NASP archery team or club.</p>
Teacher/ school characteristics	<p>Do you consider your place of residence to be in a big city or urban area, suburban area, a small city or town, or a rural area?</p> <p>What races or ethnic background do you consider yourself?</p> <p>How old are you?</p> <p>What is your gender?</p> <p>What is the name of your school?</p> <p>In which county is your school located?</p> <p>In which state is your school located?</p> <p>What grade level(s) do you teach?</p>

**Outputs: The Learning Skills and Attitudes Students Practice During Archery**

<b>Variable</b>	<b>Applicable Questions</b>
Develop learning skills (focus, concentration)	<p>Rate 1-5 (strongly agree, moderately agree, neither agree nor disagree, moderately disagree, strongly disagree, or don't know):</p> <ul style="list-style-type: none"> <li>• Improved student concentration and focus</li> <li>• Improved student self-confidence</li> <li>• Improved student motivation</li> <li>• Improved student behavior</li> <li>• Improved student attitudes</li> </ul> <p>How has archery affected student behavior? (improved, stayed the same, worsened, don't know)</p> <p>What, specifically, about the program do you think affects student behavior? (fewer discipline problems, better interpersonal relationships among students, more on-task</p>

	<p>behavior, more questions, discipline problems, less focus, don't know, other)</p> <p>Did the archery program give students more, about the same, or less motivation in the following areas?</p> <ul style="list-style-type: none"> <li>• Motivation to attend school</li> <li>• Motivation to get good grades</li> <li>• Motivation to stay out of trouble</li> <li>• Motivation to participate in other sports and activities</li> <li>• Motivation to be respectful of adults and friends</li> </ul> <p>Rate 1-5 (strongly agree, moderately agree, neither agree nor disagree, moderately disagree, strongly disagree, or don't know): Improved working with/learning from the archery teacher</p> <p>Do you agree or disagree that student concentration improved by taking archery? (strongly agree, moderately agree, neither agree or disagree, moderately disagree, strongly disagree, don't know)</p> <p>Please explain your answer.</p>
<p>Improve student attitudes (motivation, behavior and self-confidence)</p>	<p>Rate 1-5 (strongly agree, moderately agree, neither agree or disagree, moderately disagree, strongly disagree, don't know): Improved student self-confidence</p> <p>Did the archery program give students more, about the same, or less self-confidence in the following areas?</p> <ul style="list-style-type: none"> <li>• Self-confidence about school work</li> <li>• Self-confidence about other sports and physical activities</li> <li>• Self-confidence about friendships with other students</li> <li>• Self-confidence about relationships with teachers</li> </ul>

**Outcomes: The Effects of Learning Archery on Students**

<b>Variable</b>	<b>Applicable Questions</b>
<p>Improve attendance in PE</p>	<p>Rate 1-5 (strongly agree, moderately agree, neither agree or disagree, moderately disagree, strongly disagree, don't know): Increased attendance in my PE class</p> <p>How has the NASP affected student attendance in PE class? (increased, stayed the same, decreased, don't know)</p> <p>What, specifically, about the program do you think affects student attendance? (excited to learn new thing, outside activity,</p>

	<p>feel successful, little interest, intimidated, enjoy team activities more, don't know, other)</p>
<p>Improve student performance in PE</p>	<p>Rate 1-5 (strongly agree, moderately agree, neither agree or disagree, moderately disagree, strongly disagree, don't know):</p> <p>Improved student academic performance in my PE class</p> <p>How has archery affected student academic performance in PE class? (improved, stayed the same, worsened, don't know)</p> <p>Do you think students pay more, about the same, or less attention to what they are doing in the NASP archery course than in other classes? (more, same, less, don't know)</p> <p>Please explain your answer.</p>
<p>Improve attendance at school</p>	<p>Rate 1-5 (strongly agree, moderately agree, neither agree or disagree, moderately disagree, strongly disagree, don't know)</p> <p>Increased attendance in school</p> <p>How has the NASP affected student attendance in school? (increased, stayed the same, decreased, don't know)</p>
<p>Improve student performance in school</p>	<p>Rate 1-5 (strongly agree, moderately agree, neither agree or disagree, moderately disagree, strongly disagree, don't know):</p> <p>Improved student academic performance in school</p> <p>How has archery affected overall student academic performance in school? (improved, stayed the same, worsened, don't know)</p> <p>What, specifically, about the program do you think affects student performance? (learn how to learn, confident, learn focus, learn to follow directions, don't know, other)</p>
<p>Increase student interest/ involvement in archery</p>	<p>Rate 1-5 (strongly agree, moderately agree, neither agree or disagree, moderately disagree, strongly disagree, don't know):</p> <p>Increased student interest / participation in other sports</p> <p>After teaching the archery course, have you noticed an increase or decrease in students' interest in the following sports?</p> <p>Archery</p>
<p>Increase student interest in other sports</p>	<p>After teaching the archery course, have you noticed an increase or decrease in students' interest in the following sports? (increase, remained the same, decreased, don't know)</p> <p>Golf; soccer; basketball; volleyball; baseball or softball; tennis; track or cross country; target shooting with a gun; hunting with a bow and arrow; hunting with firearms, such as a rifle or shotgun; shooting BB, pellet, or air guns; or shooting paintball</p>

## Analyses

Survey results were analyzed to obtain descriptive statistics as well as to examine relationships among variables, such as number of years of involvement and perceptions of effect on students and teacher confidence. When cross-tabulations of survey results were run, chi-square significance values ( $p$ ) were used to confirm whether the relationship occurred by chance (e.g., whether teachers who have been involved with the NASP for 3 or more years are more likely to say that the NASP increases student self-confidence and self-motivation than teachers who have taught the NASP for less time). If the  $p$ -value is .05 or less, there is a 95% chance that the relationship did not occur by chance. For this project, Responsive Management used Web-based data collection; all survey data were processed and analyzed using SPSS for Windows software and proprietary software developed by Responsive Management. Throughout this report, findings of the survey are reported at a 95% confidence interval. If instructors preferred, they could be interviewed by telephone as an alternative to completing an online survey; the same questions were used. All 408 respondents completed online surveys.

For the entire sample of NASP instructors, the sampling error is at most plus or minus 4.59 percentage points. This means that if the survey were conducted 100 times on different samples that were selected in the same way, the findings of 95 out of the 100 surveys would fall within plus or minus 4.59 percentage points of each other. Sampling error was calculated using the formula described below, with a sample size of 408 and a population size of 3,932.

**Table 2. Sampling Error Equation**

$$B = \left( \sqrt{\frac{N_p(.25)}{N_s} - .25} \right) (1.96)$$

Where: B = maximum sampling error (as decimal)  
N<sub>p</sub> = pop. size (i.e., total number who could be surveyed)  
N<sub>s</sub> = sample size (i.e., total number of respondents surveyed)

Derived from formula in Dillman (2000), p. 206.

**Note:** This is a simplified version of the formula that calculates the *maximum* sampling error using a 50:50 split (the most conservative calculation because a 50:50 split would give maximum variation).

Note that some results may not sum to exactly 100% because of rounding. Additionally, rounding on the graphs may cause apparent discrepancies of 1 percentage point between the graphs and the reported results of combined responses (e.g., when “strongly support” and “moderately support” are summed to determine the total percentage in support). To test the hypotheses, descriptive statistics about each of the variables were created. Correlations between the conditions of the implementation, the satisfaction of the instructor, and the demographic characteristics of the instructor and their responses about

the effects of the NASP were examined to provide further insight into differences in responses. Correlations among variables were conducted to understand the interplay of the variables about engagement and motivation factors with effects.

When cross-tabulations of survey results were run, chi-square significance values ( $p$ ) were used to confirm whether the relationship occurred by chance (e.g., whether teachers who have been involved with the NASP for 3 or more years are more likely to say that the NASP increases students' self-confidence and self-motivation than teachers who have taught the NASP for less time). If the  $p$ -value is .05 or less, there is a 95% chance that the relationship did not occur by chance.

### ***Sample Identification and Characteristics***

Responsive Management worked closely with the NASP coordinators in each state to contact NASP instructors individually. Each instructor received an initial e-mail letter explaining the purpose of the project and requesting their participation by completing an instructor survey and/or working with Responsive Management to administer surveys to their students. Respondents were later sent an additional e-mail with a link to the online survey. As an alternative, instructors were also given the option to complete a scheduled interview with Responsive Management's professional staff at their convenience. To encourage participation, instructors who completed the survey were entered into a drawing to win a free archery bow for their classroom.

Responsive Management conducted the survey in August-September 2008 and obtained a total of 408 completed surveys and interviews; note, however, that not all graphs and data tables represent this number of responses, as some respondents chose not to answer certain questions. A central data management site at the Responsive Management office allowed for rigorous quality control over the data collection. Responsive Management maintains its own in-house telephone interviewing and data entry facilities, staffed by professionals with experience conducting studies regarding outdoor recreation.

For this project, Responsive Management used Web-based data collection; all survey data were processed and analyzed using SPSS for Windows software and proprietary software developed by Responsive Management. Data processing and analysis included coding, cleaning of data, preparation of straight tabulations, computer processing with cross tabulations, and preparation of study printouts. Responsive Management created data tables and graphs to correspond with each question for easy review and visual display of survey data results. In those cases in which cross-tabulations were run, those tabulations were also graphed.

### III. RESULTS AND DISCUSSION

Findings are reported by hypothesis. The findings reported here are only for the Instructor Survey.

#### **Hypothesis 1: Learning Archery Is Engaging to Students**

The first hypothesis is that learning archery is engaging to students. It is important to establish the veracity of this statement, because engagement is prerequisite to affecting student learning skills and attitudes and, subsequently, their attendance and performance. This hypothesis was examined by considering the responses of instructors on their perceptions of how engaging the NASP is to students, how they implement it, their satisfaction with the program, and their demographic characteristics. The findings here address questions such as the following: Is archery, as taught through NASP, engaging to students? Do instructors feel satisfied with the program and their own preparation? How do they implement the program in their own school?

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*"I think students that have not been exposed to this sport are a little intimidated at first, but find out how easy it is. Then, they get a bull's-eye—now you really have their attention and excitement!"*

~ Kentucky Instructor

*"Archery seems to be something the students are interested in learning. An interesting subject matter is a key component in student learning and achievement."*

~ Georgia Instructor

*It is an exciting sport—a brand new opportunity for the students. It is a sport where the students compete with themselves as well as with each other."*

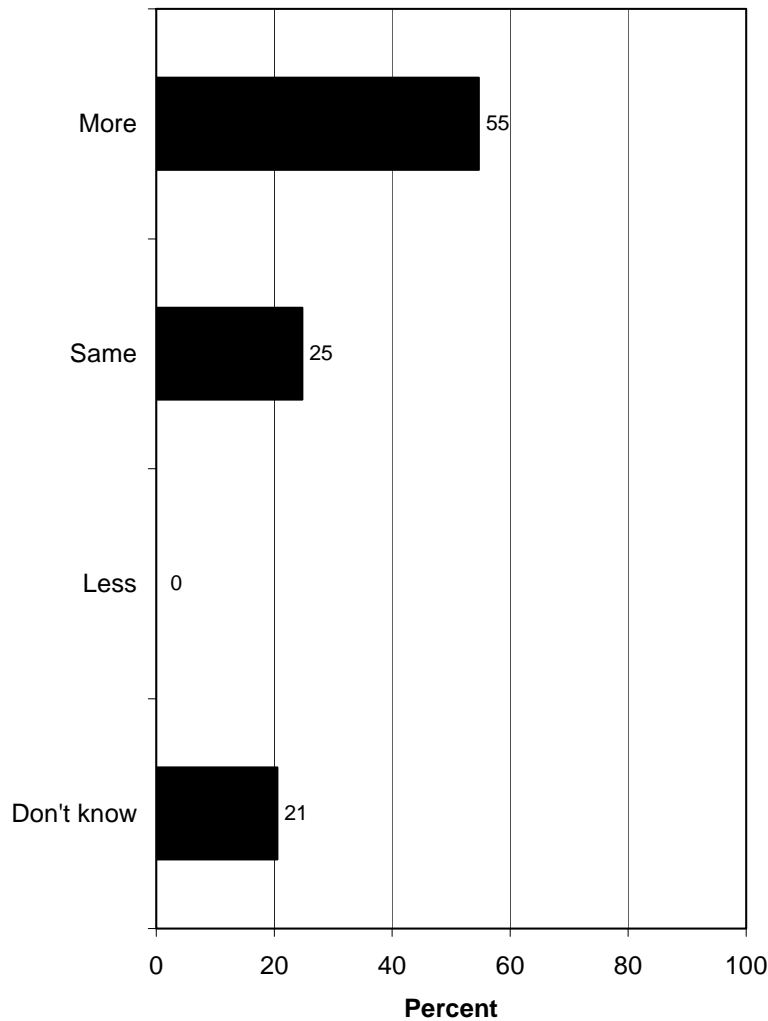
~ Florida Instructor

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*Student Engagement With Archery*

Over half (55%) of the instructors say their students appear to look forward to going to school more on the days they attend the NASP course, while a quarter of instructors (25%) say students look forward to going to school about the same on NASP days. Twenty-one percent (21%) responded that they did not know. The average was 2.69 on a scale of 1 to 3.

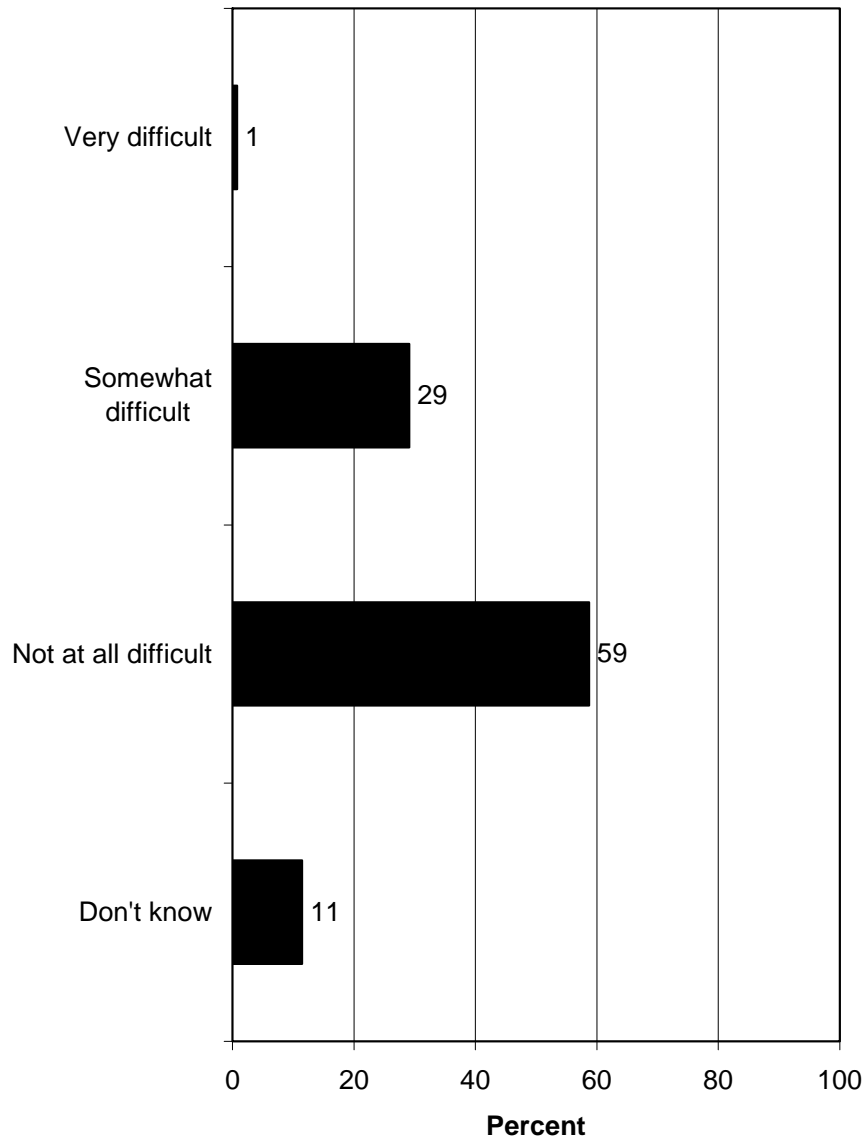
**Q19. Did the students appear to look forward to going to school more, about the same, or less on the days they attended the NASP archery course?**



**Figure 1. Degree to which students look forward to archery class days.**

The majority of NASP instructors (59%) say that the course was not at all difficult for their students as a whole, while 29% describe the course as being somewhat difficult for their students. Eleven percent (11%) responded that they did not know.

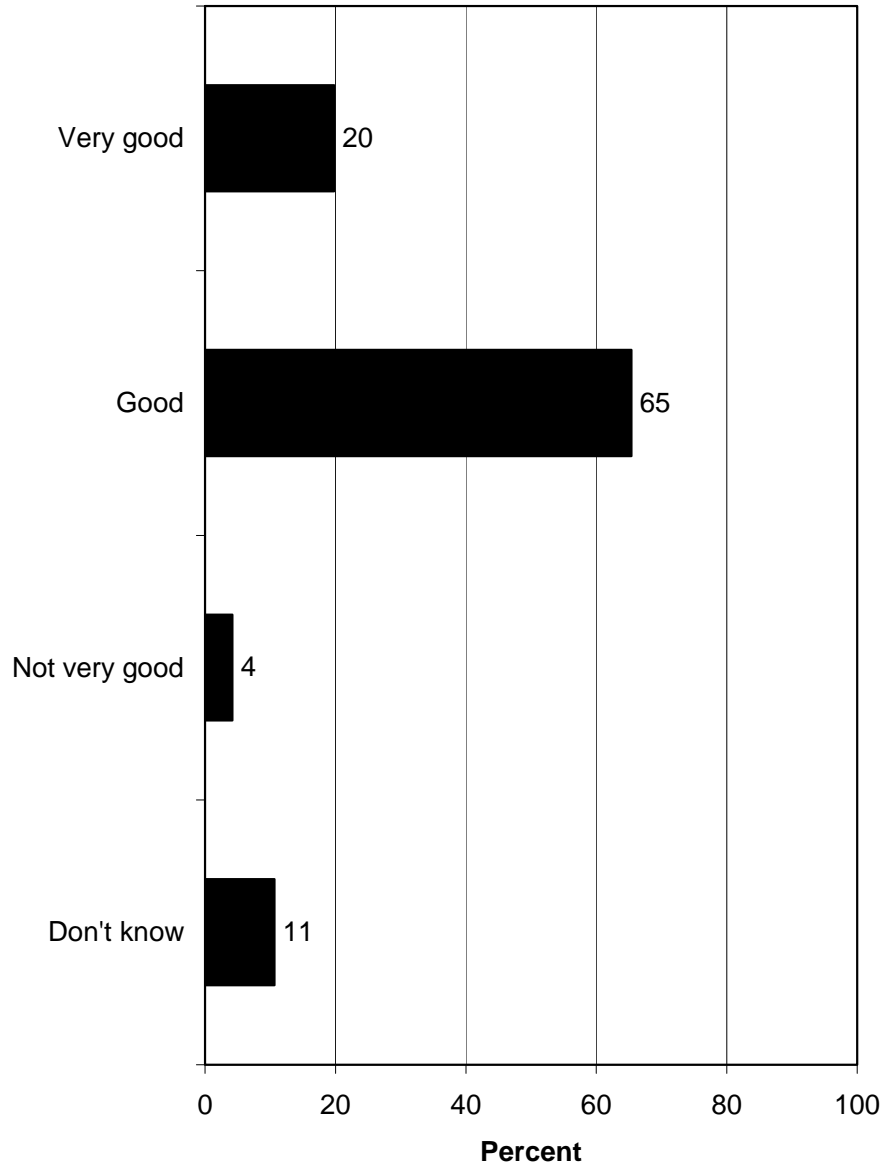
**Q16. How difficult was the NASP archery course for your students as a whole?**



**Figure 2. Difficulty of the NASP course for students.**

Most instructors rate their students' archery skills as either good (65%) or *very good* (20%). Eleven percent (11%) responded that they did not know.

**Q32. Overall, how would you rate the archery skills of your students as a whole?**

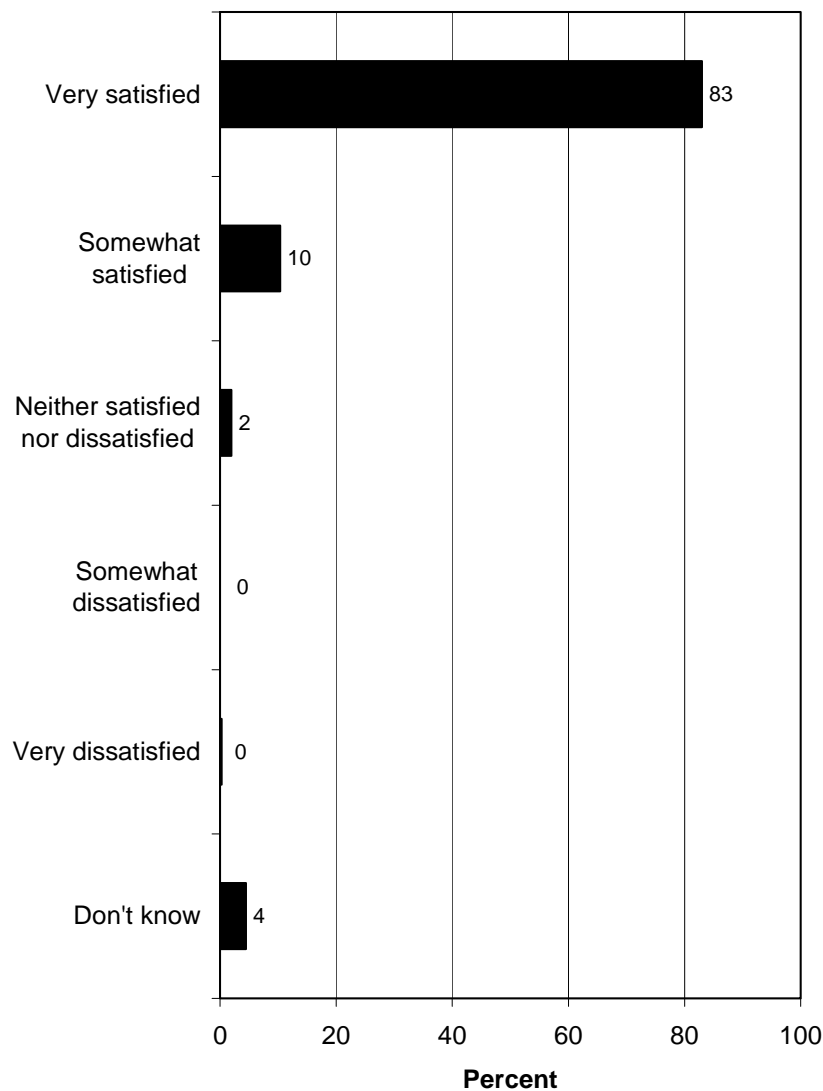


**Figure 3. Instructor rating of student archery skills.**

### *Teacher Satisfaction*

A large majority of instructors (83%) are *very* satisfied with the NASP, with another 10% reporting they are somewhat satisfied. The average rating by instructors of their satisfaction was 4.85 on a scale of 1 to 5. Four percent (4%) reported they did not know. Less than one percent (<1%) did not respond. The average rating was *very* satisfied.

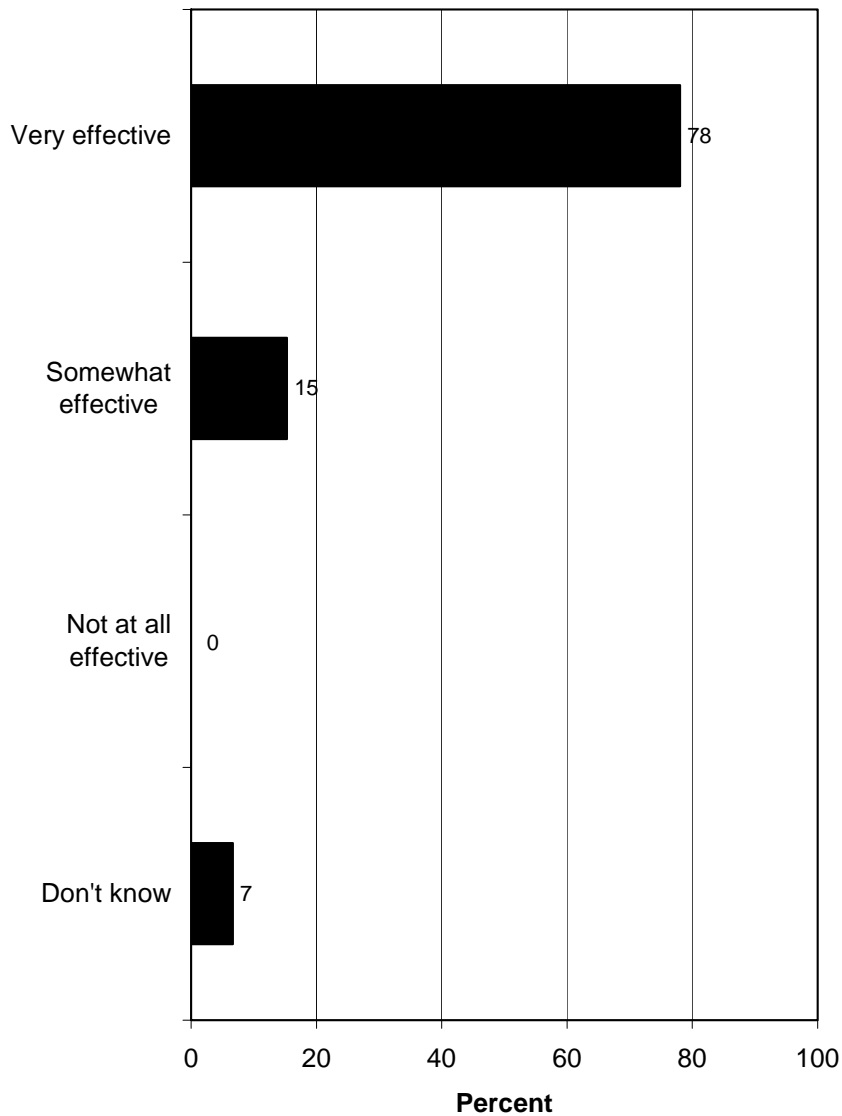
#### **Q13. How would you rate your overall satisfaction with the NASP?**



**Figure 4. Overall satisfaction rating of the NASP by instructors.**

Similarly, 78% of NASP instructors report that the program is very effective, with another 15% rating the NASP course as somewhat effective. The average rating by instructors of their satisfaction was 2.84 on a scale of 1 to 3. Seven percent (7%) reported that they did not know, and less than one percent (<1%) did not respond.

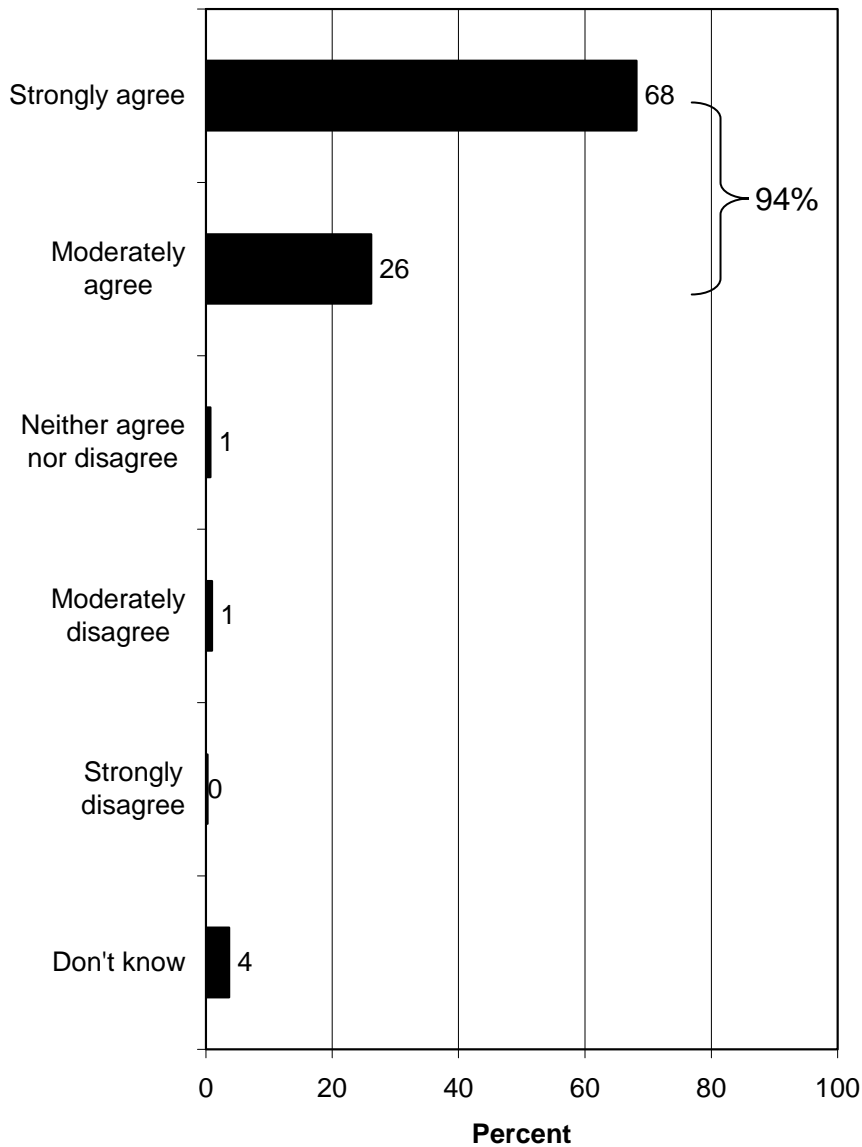
### Q14. How effective is the NASP?



*Figure 5. Effectiveness rating of the NASP by instructors.*

A large majority of instructors (94%) strongly or moderately agree that their NASP training adequately prepared them to teach the NASP course. Four percent (4%) said that they did not know. The average rating was 4.67 on a scale of 1 to 5.

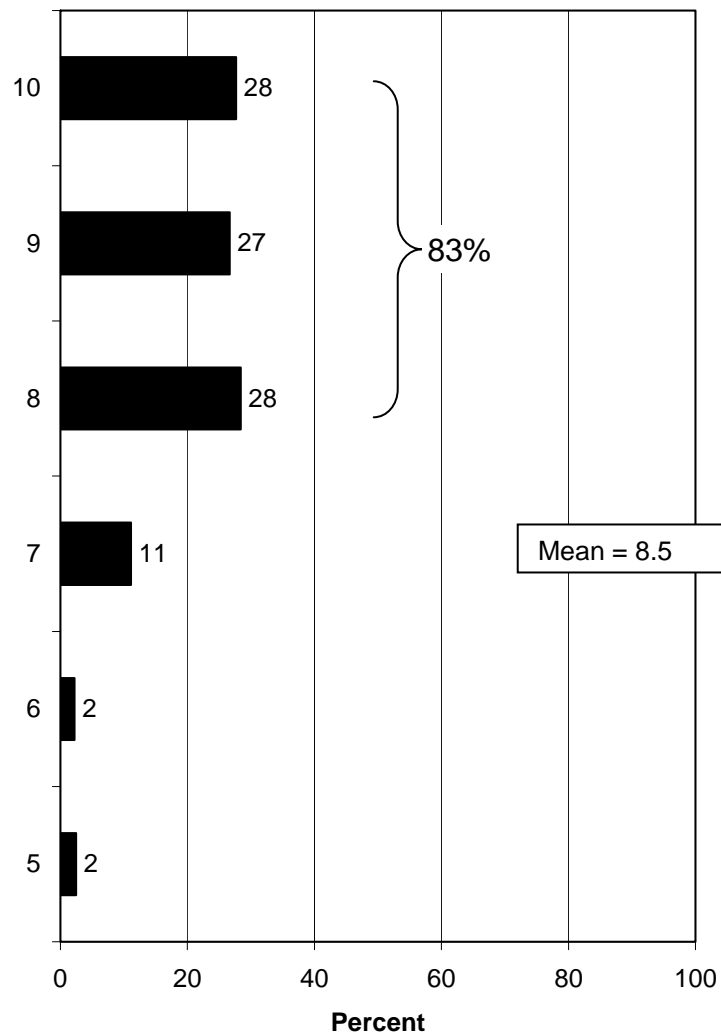
**Q17. Do you agree or disagree that your NASP training adequately prepared you to teach the NASP course?**



**Figure 6. Level of instructor satisfaction with the NASP training.**

When asked to rate their competence in teaching the NASP course on a scale of 0 to 10 (where 0 is incompetent and 10 is extremely competent), 83% of respondents rate themselves at least an 8. Fifty-five percent (55%) of instructors rate themselves a 9 or 10: about a quarter of instructors (28%) rate themselves a 10, while about the same number (27%) rate themselves a 9. No instructors rated themselves below the midpoint (5). The average rating was 8.50 on a scale of 0 to 10.

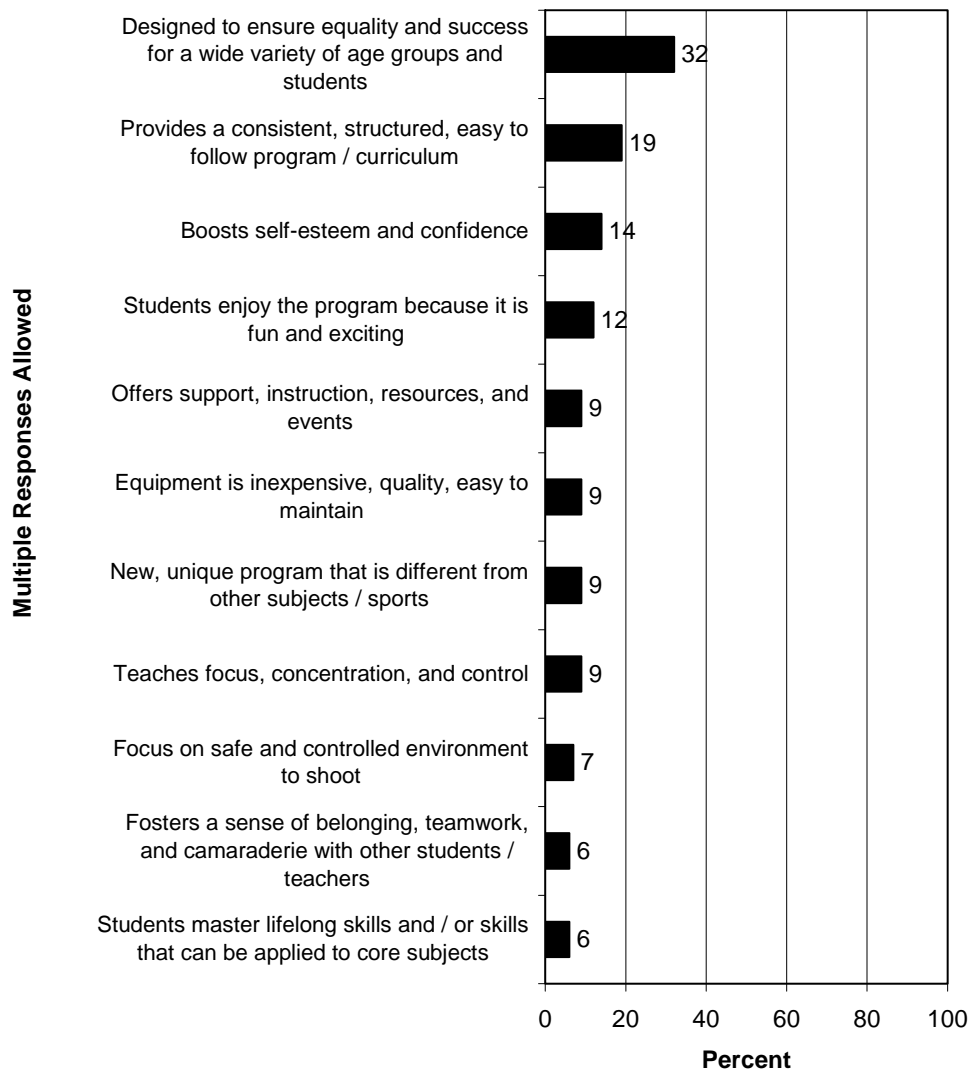
**Q18. On a scale of 0-10, with 0 being incompetent and 10 being extremely competent, please rate your competency in teaching the NASP archery course.**



**Figure 7. Instructor self-rating of competence in teaching the NASP.**

In an open-ended question, instructors were asked to identify the strengths of the NASP, and the most common response was that the NASP ensures equality and success for a wide range of age groups and students (32%). Nearly a fifth of instructors (19%) said that the NASP offers a consistent, structured, easy to follow curriculum, while 14% noted that the NASP boosts self-esteem and confidence; 12% said students enjoy the program because it is fun and exciting. Other notable responses regarding strengths of the NASP included the following: 1) that the NASP offers support, instruction, resources, and events; 2) that NASP equipment is inexpensive, quality, and easy to maintain; 3) that the NASP represents a new and unique program that is different from other subjects and sports; and 4) that the NASP teaches focus, concentration, and control.

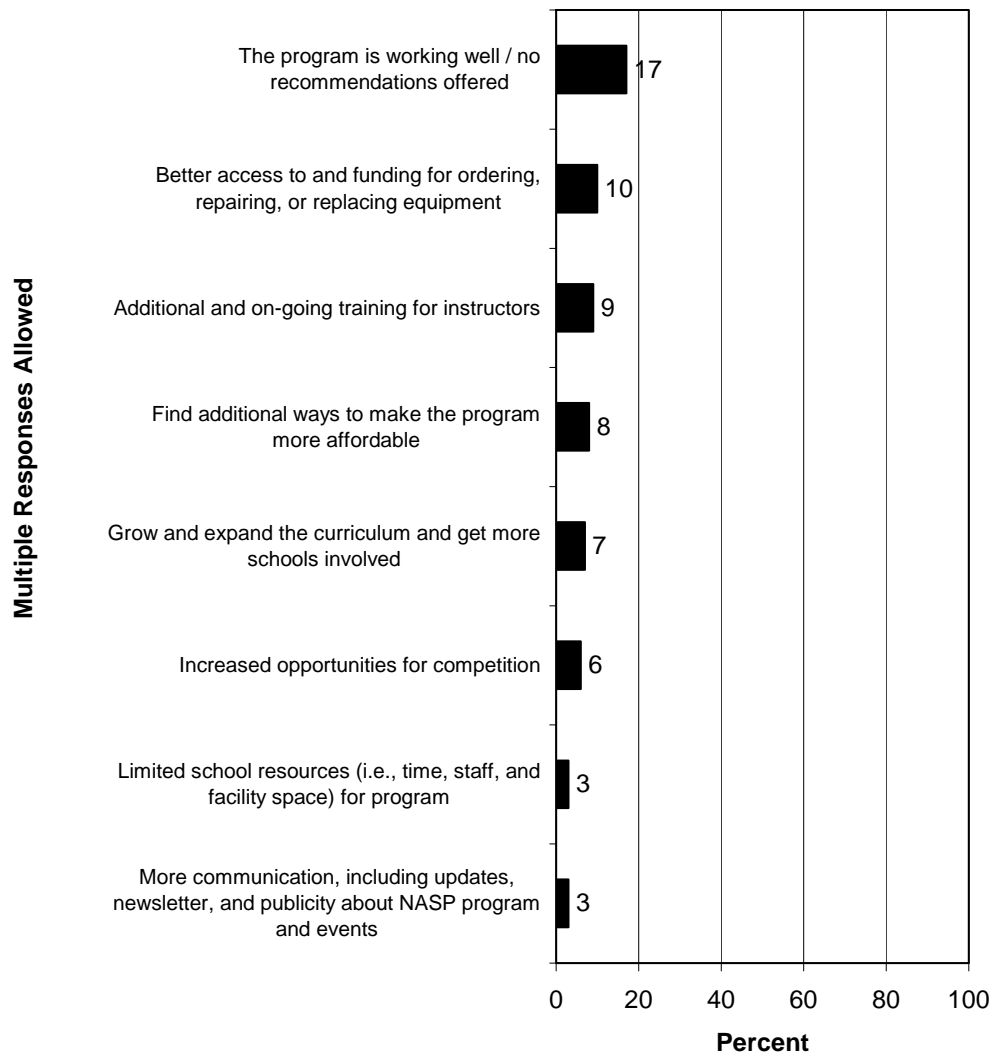
**Q36. Based on your overall impression of the program and its effect on your students, please identify the strengths of the NASP. (Part 1.)**



**Figure 8. Strengths of the NASP.**

Instructors were also asked to identify any recommendations they had for improving the NASP, and they most commonly responded that they had no suggestions or recommendations for improvements (17%). Otherwise, some of the top recommendations included better access to funding for ordering, repairing, or replacing equipment (10%); additional and ongoing training for instructors (9%); additional ways of making the NASP more affordable (8%); growing and expanding the curriculum to involve more schools (7%); and increasing opportunities for competition (6%).

**Q37. Based on your overall impression of the program and its effect on your students, please offer any recommendations you have for improving the NASP. (Part 1.)**

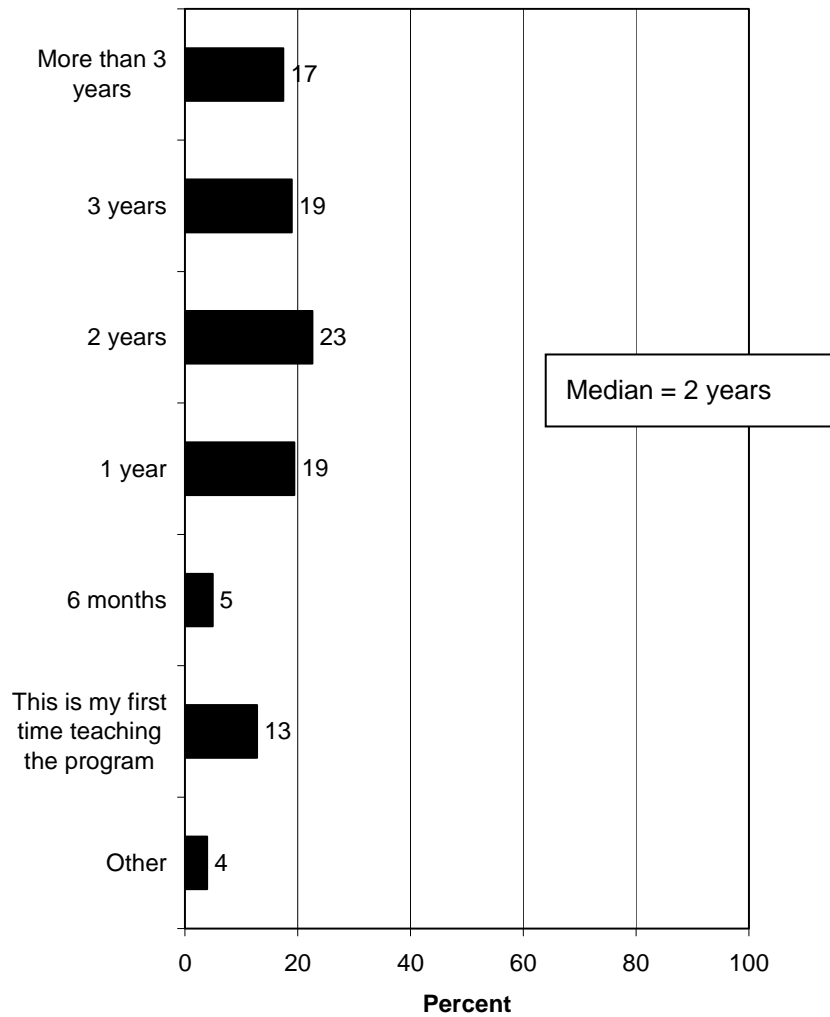


**Figure 9. Recommendations.**

*Nature of Implementation*

The survey asked instructors how long they have been involved in the NASP in their current school, and the majority (59%) say they have been involved for at least 2 years. Seventeen percent (17%) have been involved for more than 3 years, and 61% between 1 and 3 years. Thirteen percent (13%) say it is their first year teaching the program. A cross-tabulation found that instructors with 3 or more years of experience teaching the NASP were significantly more likely to moderately or strongly agree with several statements saying that the NASP positively affects student learning skills and attitudes, attendance and performance in class, and interest in archery and other sports.

**Q2. How long have you been involved in the NASP in your current school?**



**Figure 10. Length of involvement with the NASP.**

When forced to choose the primary mode of implementation, instructors most commonly report that the NASP is offered as an after-school club or team (37%), as an elective course for students who choose to take physical education (30%), or as a required course for certain grade levels (23%). Nearly a fifth of schools (17%) offer the NASP as a required course for *every* student participating in the physical education curriculum.

### Q3. Is the NASP a required course as a part of the curriculum at your school?

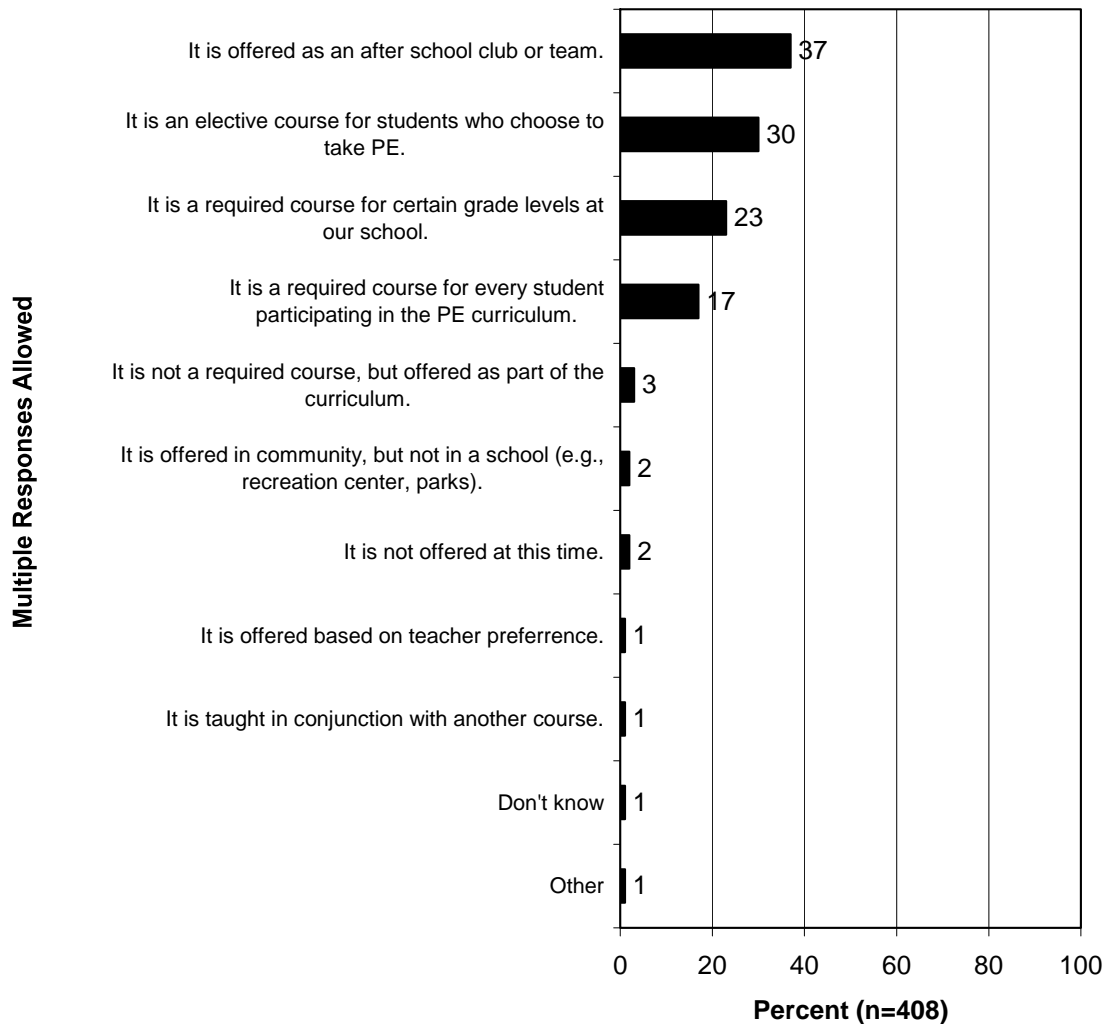
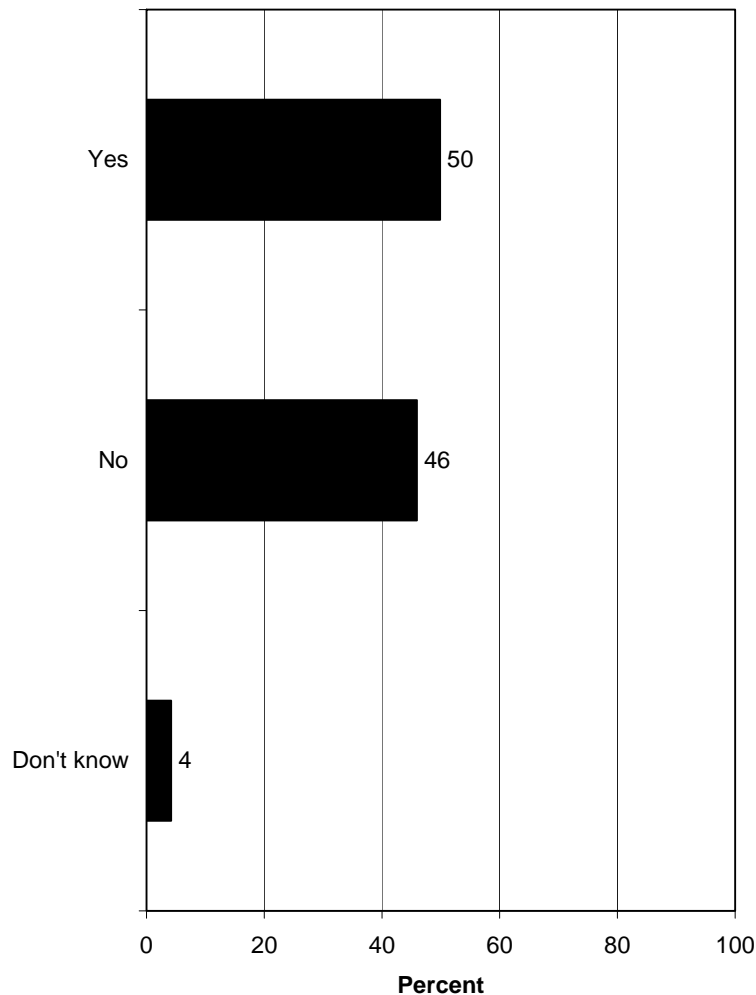


Figure 11. How the NASP is offered at the school.

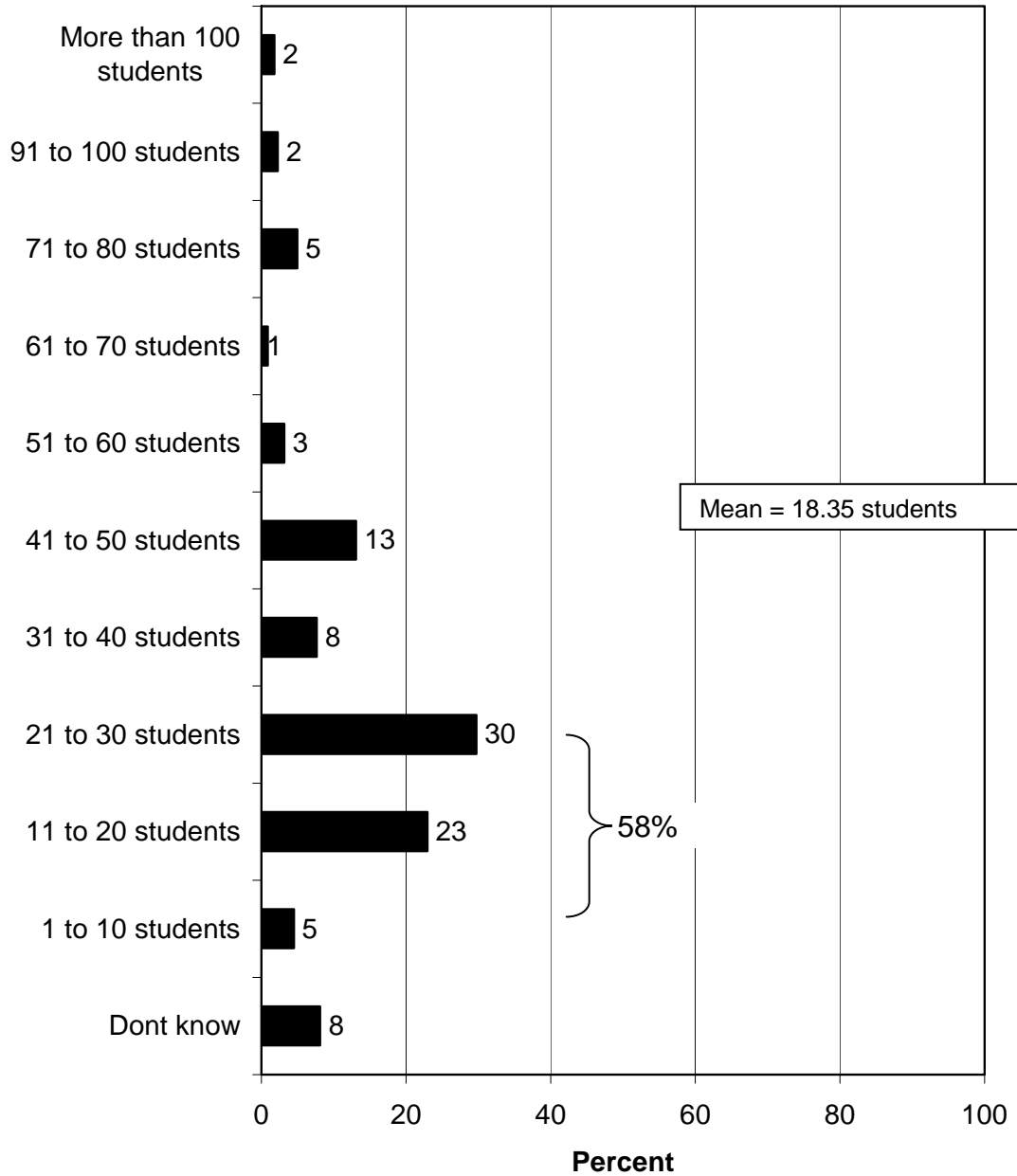
When asked if they have an after-school club, 50% of the instructors report that they have an after-school archery team or club, which suggests that 13% of schools use the NASP in school and after school. Of those who report having clubs, 58% report 30 or fewer students who participate. The average size of after-school archery teams or clubs is approximately 18 students. A cross-tabulation found that instructors who teach at schools with an after-school archery team or club were significantly more likely to see the NASP as positively affecting student learning skills and attitudes, student attendance and performance, and student interest in archery and other sports.

**Q10. Does your school have an after-school NASP archery team or club?**



**Figure 12. Percentage of schools offering an NASP team or club.**

**Q11. Approximately how many students belong to the NASP archery team or club each year?**



**Figure 13. Number of students involved in the NASP team or club each year.**

Among schools that do not offer a NASP after-school archery team or club, staffing availability issues (27%), time/scheduling issues (20%), limited facility availability (16%), conflicts with other sports/extracurricular activities (15%), and limited funding (10%) are the most common reasons for not offering an after-school archery team or club.

**Q12. Please explain why your school does not offer a NASP archery team or club. (Among those whose schools do not offer a NASP team or club.)**



**Figure 14. Reasons for not offering a NASP team or club.**

The NASP course is most commonly taught for 2-3 weeks (30%), while the majority of instructors (56%) teach the NASP course in their PE curriculums for less than 4 weeks. Just 12% of instructors teach the NASP course for at least a semester. A cross-tabulation found that instructors who teach the NASP for 4 weeks or more were significantly more likely to moderately or strongly agree with several statements saying that the NASP positively affects students in various ways, such as by improving self-confidence or motivation.

#### Q4. How long is the NASP archery course taught in your PE curriculum?

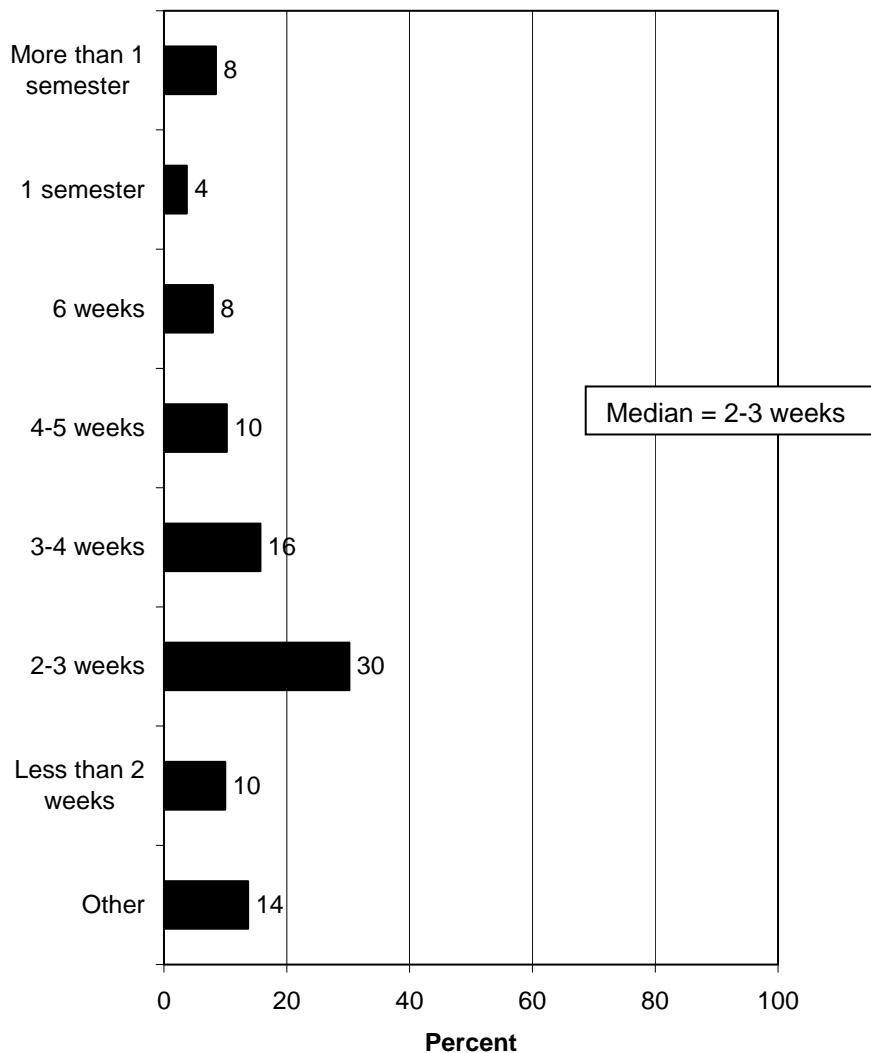
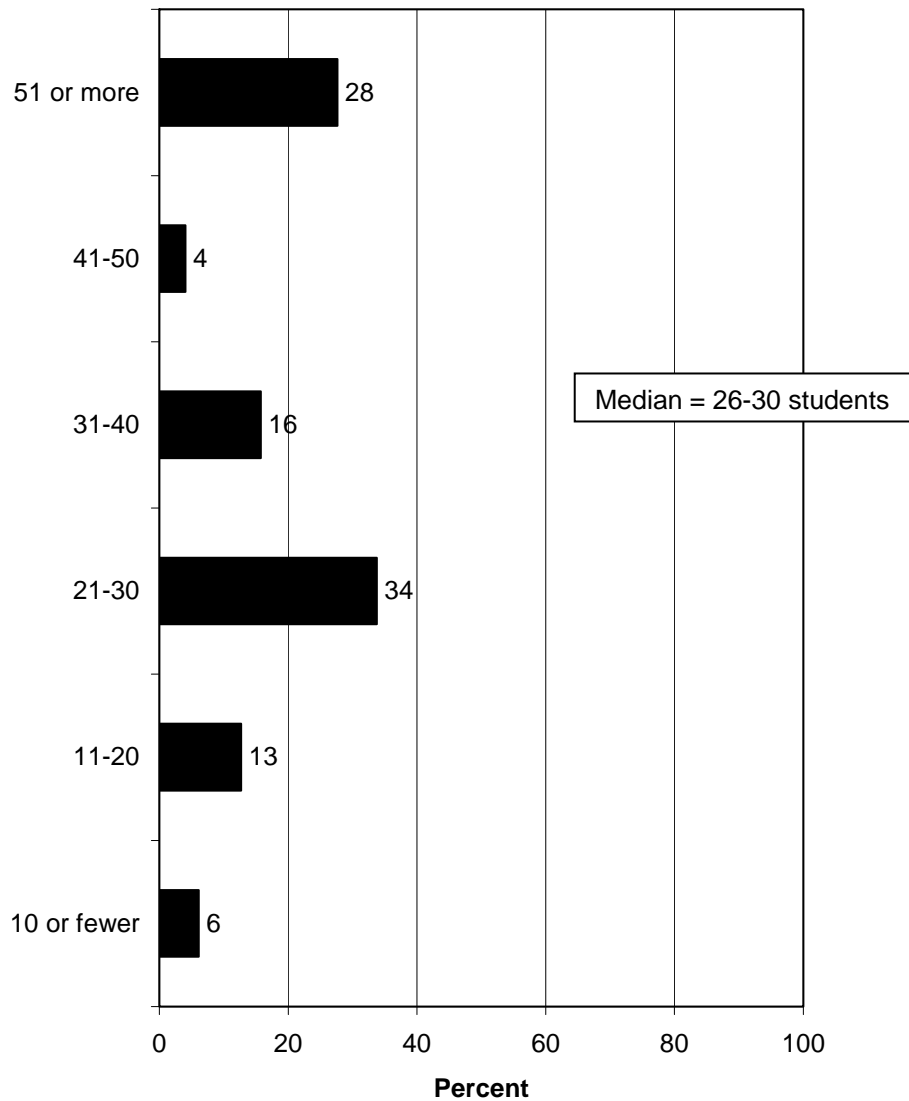


Figure 15. Length of time the NASP is taught in the PE curriculum.

Although most instructors teach NASP courses with fewer than 40 students enrolled at one time (69%), more than a quarter (28%) teach NASP courses with 51 or more students enrolled at one time. The average number of students enrolled in the NASP archery course at one time is 26-30 students.

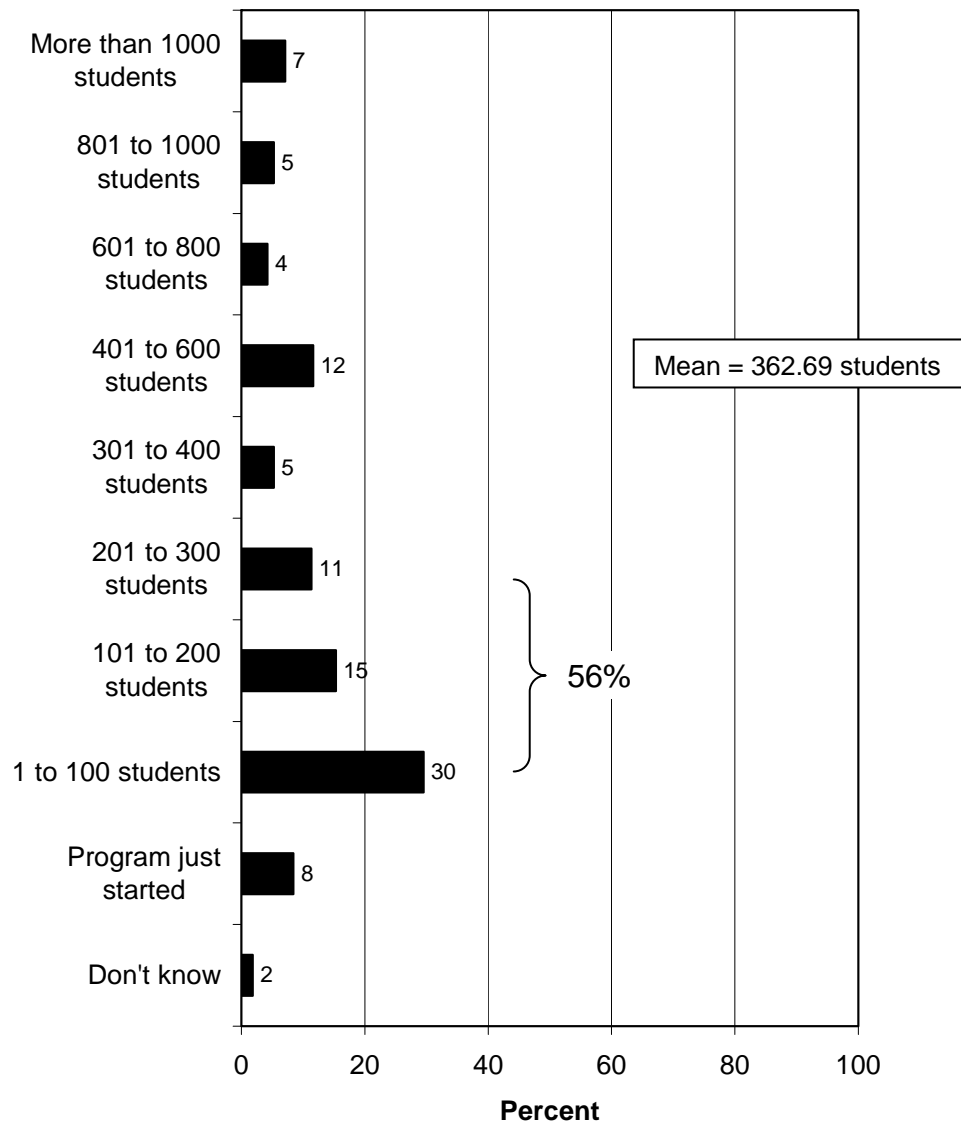
**Q5. Approximately how many students are enrolled in the NASP archery course at one time?**



**Figure 16.** Number of students enrolled in archery at any one time.

The majority of instructors' schools (56%) have had no more than 300 students participate in the NASP in the past 3 years. The average number of students participating in the schools in the past 3 years is 362.69.

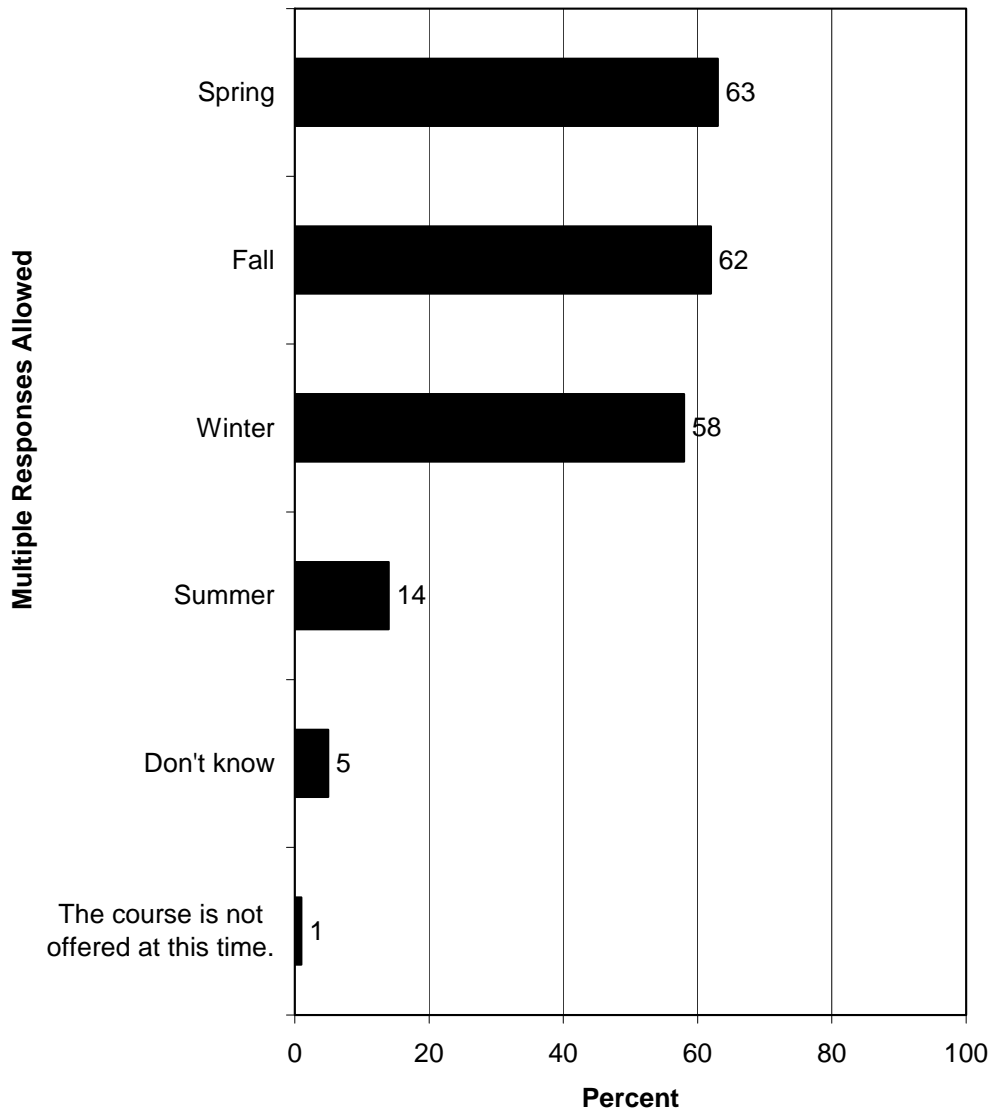
**Q6. Approximately how many students participated in the NASP during the past 3 years?**



*Figure 17. Number of students participating in the NASP during the past 3 years.*

Instructors are about equally likely to teach the NASP course during spring (63%), fall (62%), or winter (58%). (Unsurprisingly, summer is the least popular time for teaching the course.)

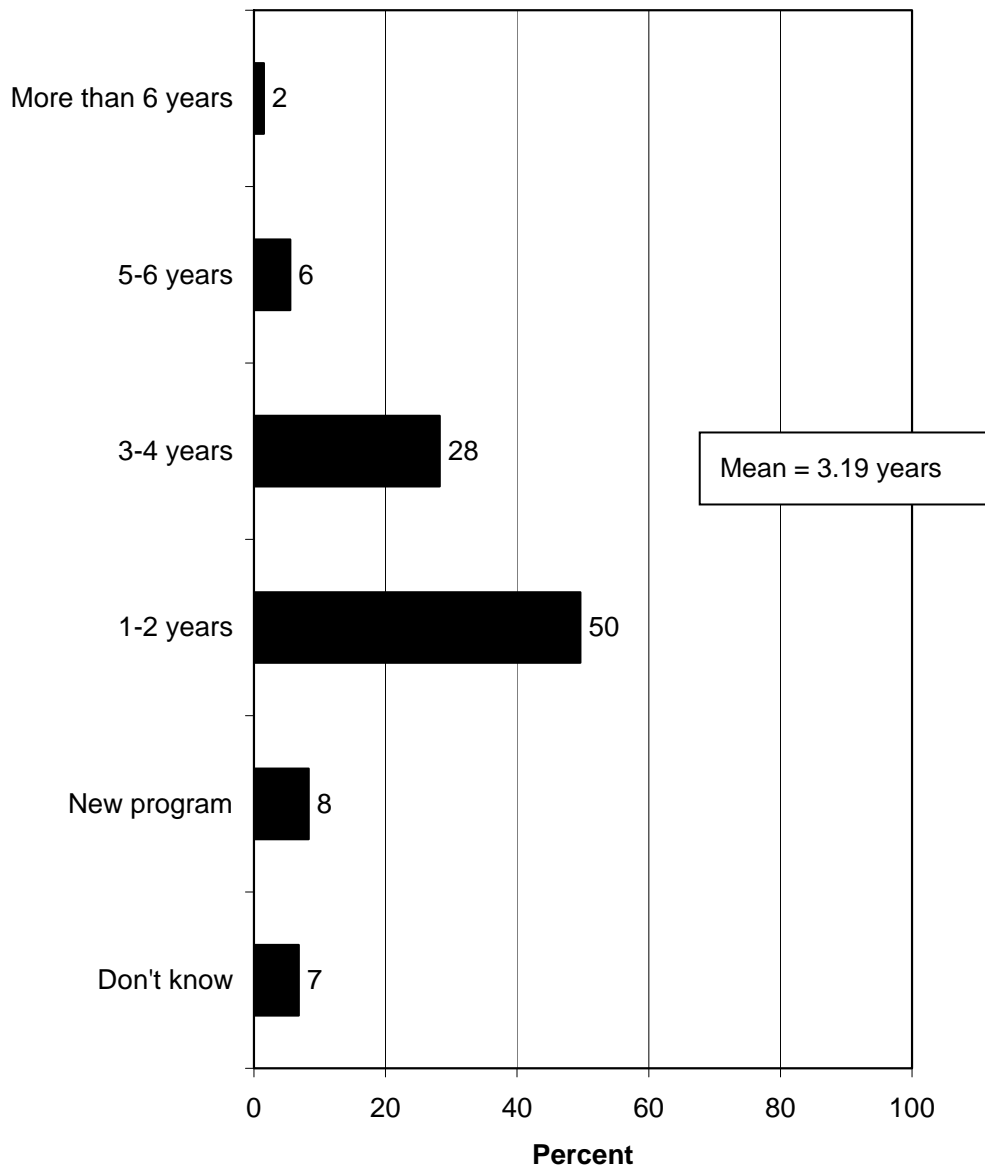
**Q7. During what season(s) do you offer the NASP archery course in your school?**



**Figure 18. Seasons in which the NASP is offered.**

Most instructors' schools have participated in the NASP for no more than 4 years (86%), while 58% have been involved for no more than 2 years. The average number of years these instructors' schools have participated in the program is 3.19 years.

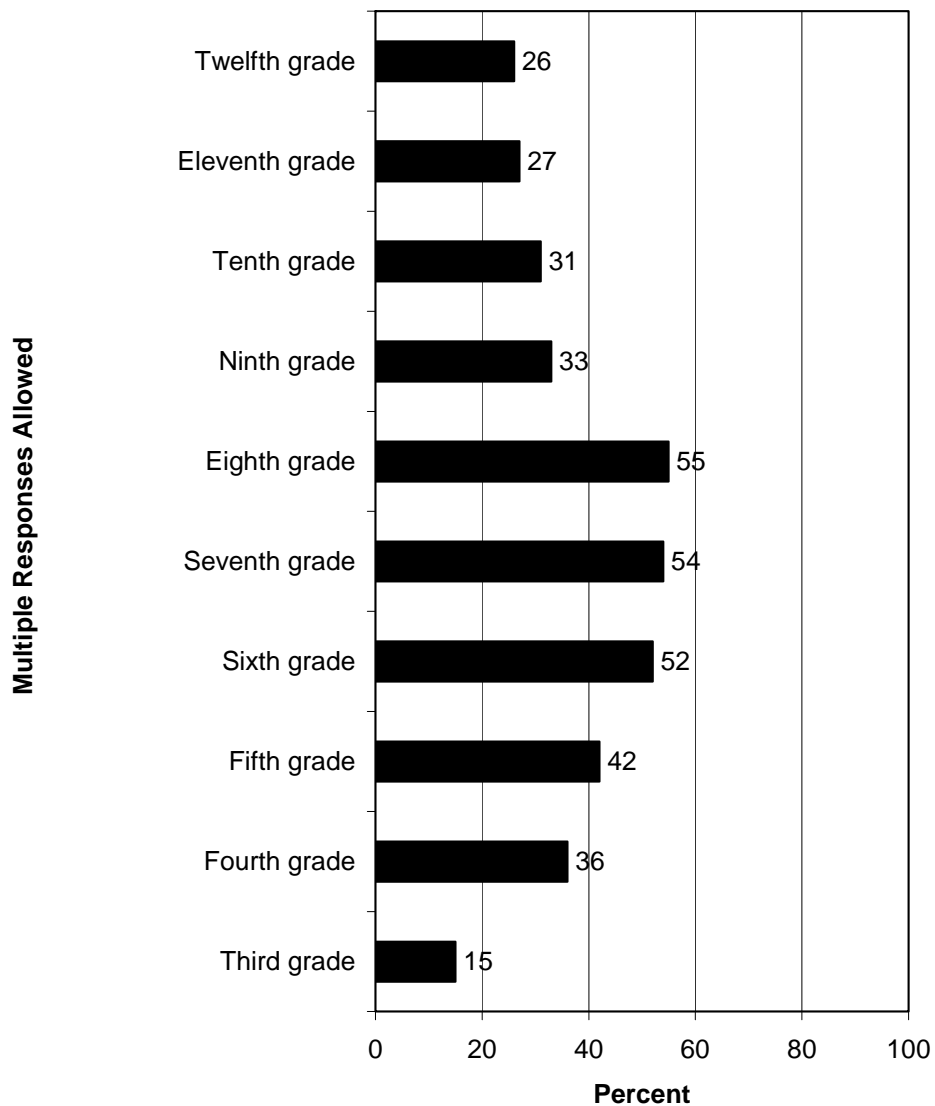
**Q8. How many years has your school participated in the NASP?**



**Figure 19.** Number of years the school has offered the NASP.

Instructors most commonly teach the NASP course to middle school grade levels, including sixth graders (52%), seventh graders (54%), and eighth graders (55%). At least a third of instructors teach the NASP course to fourth graders (36%), fifth graders (42%), and ninth graders (33%).

**Q9. In which grade levels do you teach the NASP archery course in your school?**



**Figure 20. Grades that are taught with the NASP.**

### ***Teacher/School Characteristics***

- Most respondents to the survey live in small cities or towns (39%) or rural areas (41%). The responses from urban, small cities/towns, and rural area instructors are not significantly different. This characteristic was not related to outputs or outcomes.
- The overwhelming majority of instructors consider themselves to be white/Caucasian (96%). This characteristic was not related to outputs or outcomes.
- Instructor ages are fairly well represented across the categories, while skewing slightly older (27% are 51 or older). The responses from the different age instructors are not significantly different. This characteristic was not related to outputs or outcomes.
- The gender split of respondents is 59% male, 41% female. The responses from male and female instructors are not significantly different. This characteristic was not related to outputs or outcomes.

### **Conclusions About Hypothesis 1: Learning Archery Is Engaging to Students**

These findings establish that, in the instructors' eyes, the NASP has materials that they are trained to use effectively to engage students. The variables considered in examining this hypothesis are student engagement with archery, teacher and school characteristics that might influence the level of engagement, teacher satisfaction, and the nature of the implementation.

***Students Are Engaged by the NASP.*** More than half (55%) of the instructors report that students look forward to school more on days that they have archery, that the NASP course was not at all difficult (59%) for students, and that most students became good (65%) or very good (20%) at archery as a result of the course.

***Instructors Are Satisfied With the NASP.*** Ninety-three percent (93%) of the instructors report being satisfied with the NASP, rate it as effective (93%), and are satisfied with the training they received (94%). Most instructors feel competent to teach the NASP. They see its strengths as being an affordable program, engaging to students, appropriate for different age groups, and benefiting students. Their recommendations relate to making the program even more affordable and providing additional support for replacement or repair, ongoing training for instructors, more participating schools, and more opportunities for competition.

***Instructors Implement the NASP in Different Ways.*** Instructors were asked questions about the nature of the implementation of the NASP in their schools. These data are summarized here and then used to examine if and how the nature of their implementation affected their responses about the output and outcome effects in later sections. Most instructors have been involved for at least 1 year (78%), with 13% reporting that this was their first time teaching the program. The NASP is offered as an after-school club or team by 37% of the schools, as an elective in PE for 30%, as a required course in PE by 23% of the schools, and required for all students participating in PE in 17% of the

schools. The NASP is most often offered as a 2-3 week course (30%) or as a 3-4 week course (16%). Thirty percent (30%) of schools offer archery more than 4 weeks a year. Twelve percent (12%) offer the NASP for an entire semester or more.

Most (69%) instructors teach archery to up to 40 students at a time although 32% teach more than 40 in an archery class. The majority of instructors' schools (56%) have had no more than 300 students participate in the NASP in the past 3 years. They are equally likely to teach it in the fall, spring, and winter. Most instructors' schools have participated in the NASP for no more than 4 years (86%), while 58% have been involved for no more than 2 years. Instructors most commonly teach the NASP course to middle school grade levels, including sixth graders (52%), seventh graders (54%), and eighth graders (55%). Although 37% reported having after-school clubs in an earlier forced-choice question about how archery was taught, when asked directly about having an archery club, 50% say they have 30 or fewer students participating in an after-school archery team or club. Schools that do not have a club cite staffing, time, and funding issues. There were not any significant differences in the responses based on where instructors live, their age, or their gender.

### ***Summary of Evidence for Student Engagement With the NASP***

These findings indicate that the majority of the instructors feel engaged by the NASP and that their students are engaged. They report that they are satisfied with their own preparation and how well they teach the program. Further evidence of satisfaction is that many of them have offered it over several years, for a substantial amount of time, such as 2-3 weeks, and to multiple grade levels. The instructors report that students look forward to coming to class when they are teaching archery, that the NASP is not at all difficult for students, and that most get to be good at it. The instructors see the NASP as an affordable program, engaging to students, appropriate for different age groups, and as benefiting students.

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*"NASP is strong due to the precise training certification program that beginning instructors must complete. Also, the strength is due to the dedication of educators to bring this unique curriculum to their students."*

~Kentucky Instructor

*"I'm a funny case, I've been shooting for 30 years. I grew up with archery, and I figured I was extremely qualified to start doing this. But I think the training is great—I learned a lot from the training. I would vote for more training, if anything."*

~ Michigan Instructor

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**Hypothesis 2: Through Archery, Students Improve Learning Skills  
(Concentrate, Work With the Teacher and Others), and Attitudes  
(Motivation, Behavior, Self-Confidence)**

In the previous section, it was established that, in the instructors' eyes, the NASP has materials that instructors are trained to use effectively to engage students. How do these inputs affect student learning skills and attitudes? The second hypothesis is that, in the process of learning archery, students learn to focus, concentrate, and improve with practice, and that this experience and the success they have affects their attitudes, in particular their attitudes toward themselves (self-confidence). Instructors were asked to rate the effect of the NASP on student behavior, attention, self-confidence, and motivation. Does students' behavior change in archery? Do they pay better attention? Is their self-confidence affected in areas like schoolwork, relationships with teachers and other students, or sports? Are they more motivated to get good grades, attend school, stay out of trouble, be respectful of teachers and other students, or participate in sports or other activities as a result of their archery experience? These are the questions that the findings in this section address.

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*"[It] doesn't matter if you can throw a ball, run fast, or if you're a male or female. When it comes to archery, all are on an equal playing field. NASP gives kids the opportunity to shine—athlete and non-athlete alike."*

~ Ohio Instructor

*"It gives those students who are not gifted in other sports the ability to compete for the school on a team and showcase their talents. This gives them more confidence and has changed how the rest of school sees them."*

~ Kentucky Instructor

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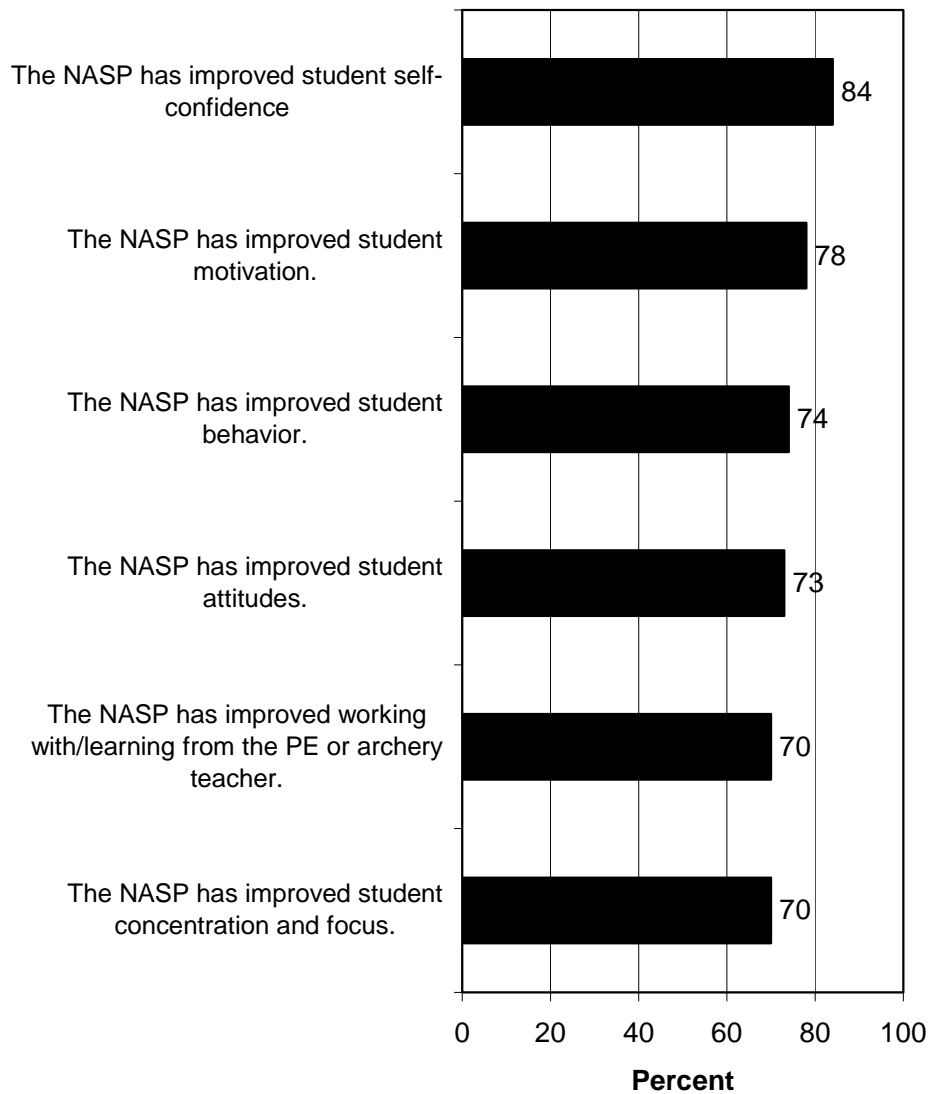
***Improve Self-Confidence, Motivation, Behavior, Attitudes, Working With the PE Teacher, and Concentration***

The majority of instructors agree (strongly or moderately) that the NASP has improved student self-confidence (84%), motivation (78%), behavior (74%), attitudes (73%), working with/learning from the PE or archery teacher (70%), and concentration and focus (70%).

**Table 3. *Effect on Self-Confidence, Motivation, Behavior, Attitudes, Working With the PE Teacher, and Concentration***

	<b>Strongly agree (5)</b>	<b>Moderately agree (4)</b>	<b>Neither agree nor disagree (3)</b>	<b>Moderately Disagree (2)</b>	<b>Strongly disagree (1)</b>	<b>Average</b>
<b>Self-confidence</b>	45.4%	39.0%	4.3%	0%	0.3%	4.46
<b>Motivation</b>	38.7%	39.4%	9.5%	0%	0.5%	4.31
<b>Behavior</b>	32.8%	41.1%	14.3%	0.3%	0.5%	4.57
<b>Attitudes</b>	32.7%	40.2%	15.8%	0.3%	0.5%	4.17
<b>Working with PE teacher</b>	31.0%	38.8%	16.1%	0.3%	0.3%	4.15
<b>Concentration</b>	27.8%	41.8%	16.5%	0.3%	0%	4.12

**Q15. Percent of instructors who moderately or strongly agree with the following statements, based on their experiences teaching the program.**



**Figure 21. Effect on self-confidence, motivation, behavior, attitudes, working with the PE teacher, and concentration.**

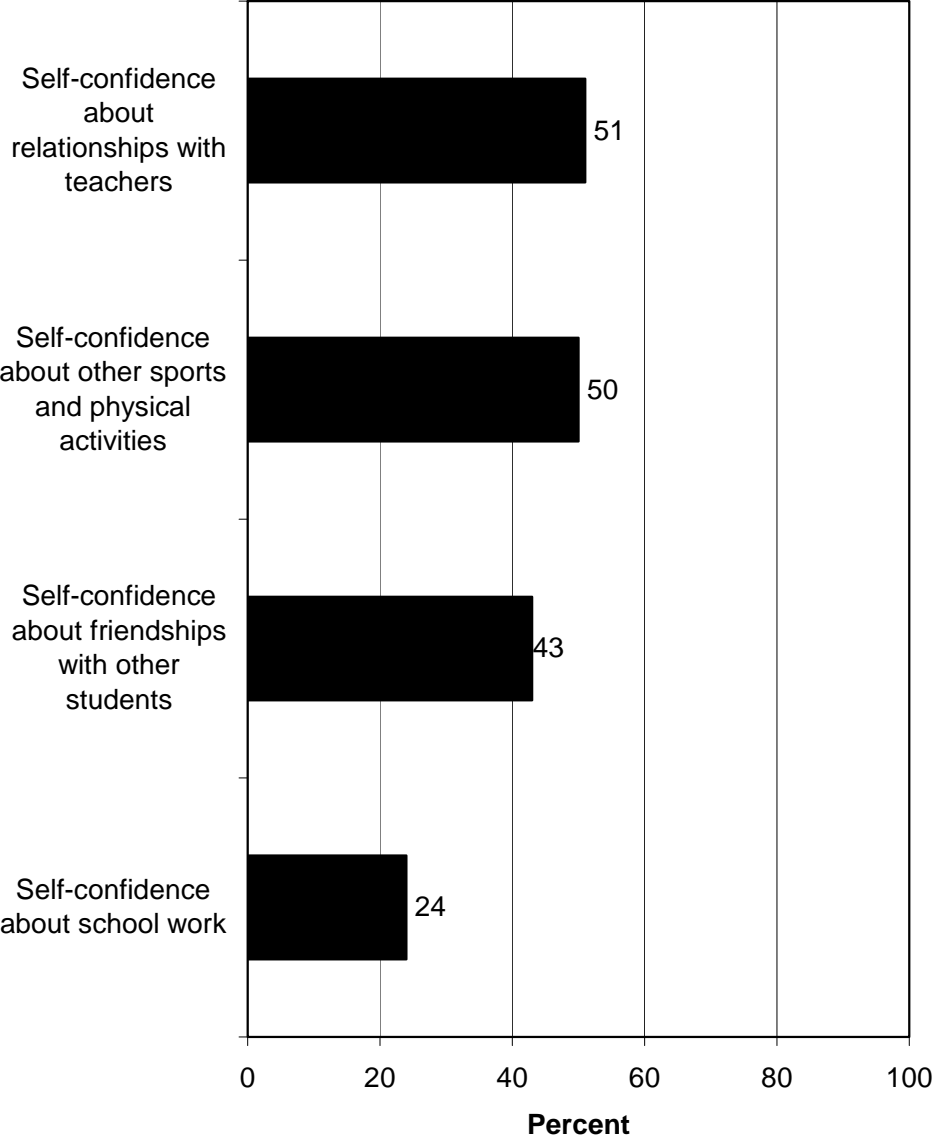
### *Improve Student Self-Confidence*

The survey asked instructors about the ability of the NASP to give students more, about the same, or less confidence in several different areas. About half of the instructors (51%) say that the NASP gives students more self-confidence about relationships with teachers and more self-confidence about other sports and physical activities (50%). Many instructors also believe that the NASP gives students more self-confidence about friendships with other students (43%).

**Table 4. Effect of the NASP on Self-Confidence in Relationships With Teachers, Other Sports, Friendships and Schoolwork**

<b>Self-confidence about:</b>	<b>Less (1)</b>	<b>Same (2)</b>	<b>More (3)</b>	<b>Average</b>
Relationships with teachers	<.5%	38%	51%	2.66
Other sports and physical activities	<.5%	32%	50%	2.64
Friendships with other students	<.5%	27%	43%	2.58
Schoolwork	<.5%	26%	24%	2.38

**Q33. Percent of instructors who agree that the NASP gave students more self-confidence in the following areas.**



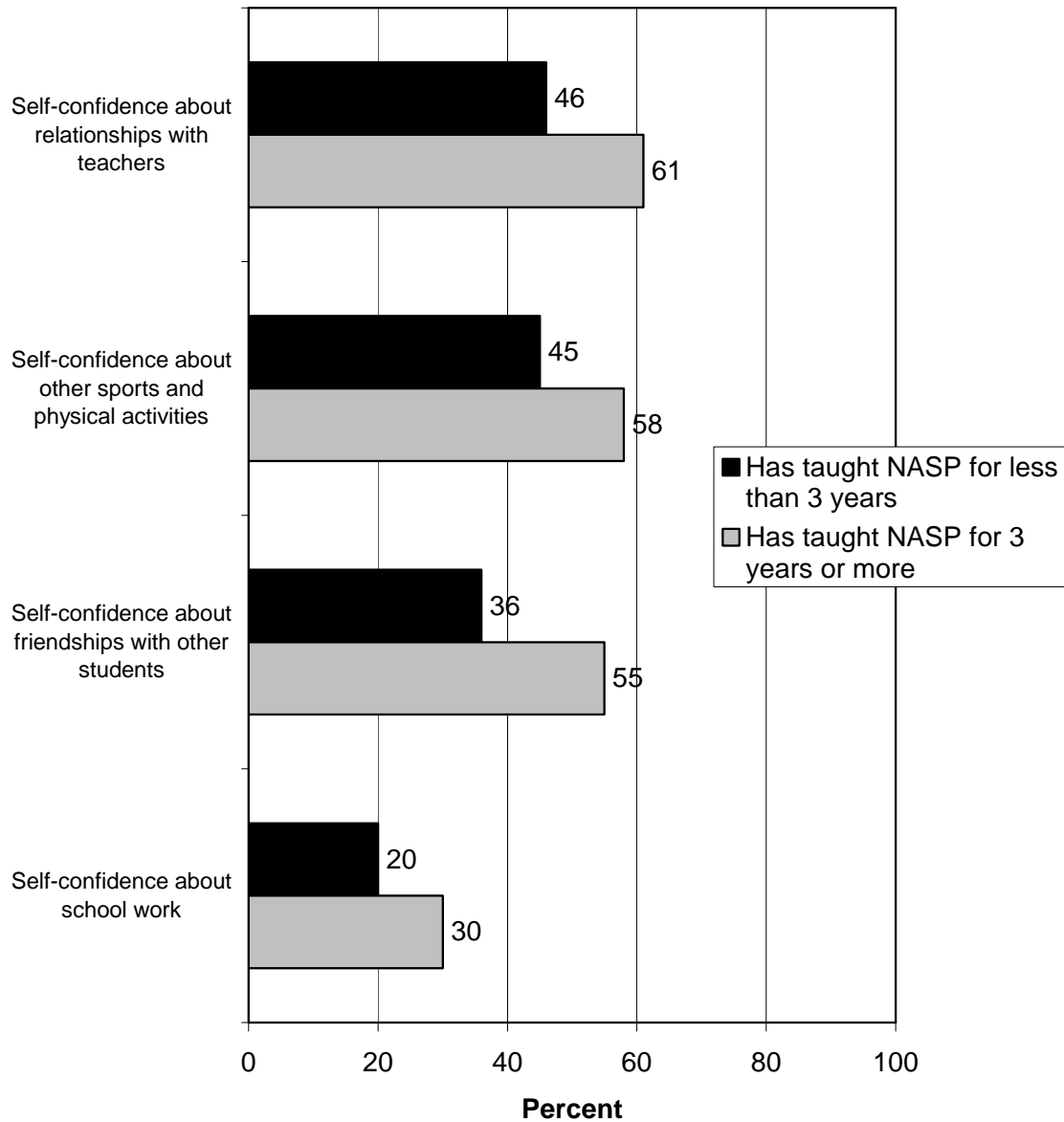
**Figure 22. Effect of the NASP on self-confidence in relationships with teachers, other sports, friendships, and schoolwork.**

The extent to which instructors reported that the NASP gives students more confidence was related to how long they had taught the NASP. Teachers who had more than 3 years of experience teaching the NASP were significantly more likely to indicate that the NASP increased student self-confidence in all areas.

**Table 5. Ratings of the Effect on Self-Confidence by Years of Instructor Experience Teaching the NASP**

<b>Self-confidence about:</b>	<b>&lt; 3 yrs</b>	<b>&gt; 3 yrs</b>	<b>Significance</b>
Relationships with teachers	46%	61%	<.001
Other sports and physical activities	45%	58%	<.001
Friendships with other students	36%	55%	<.001
School work	20%	30%	<.001

**Q33. Percent of instructors who agree that the NASP gave students more self-confidence in the following areas.**



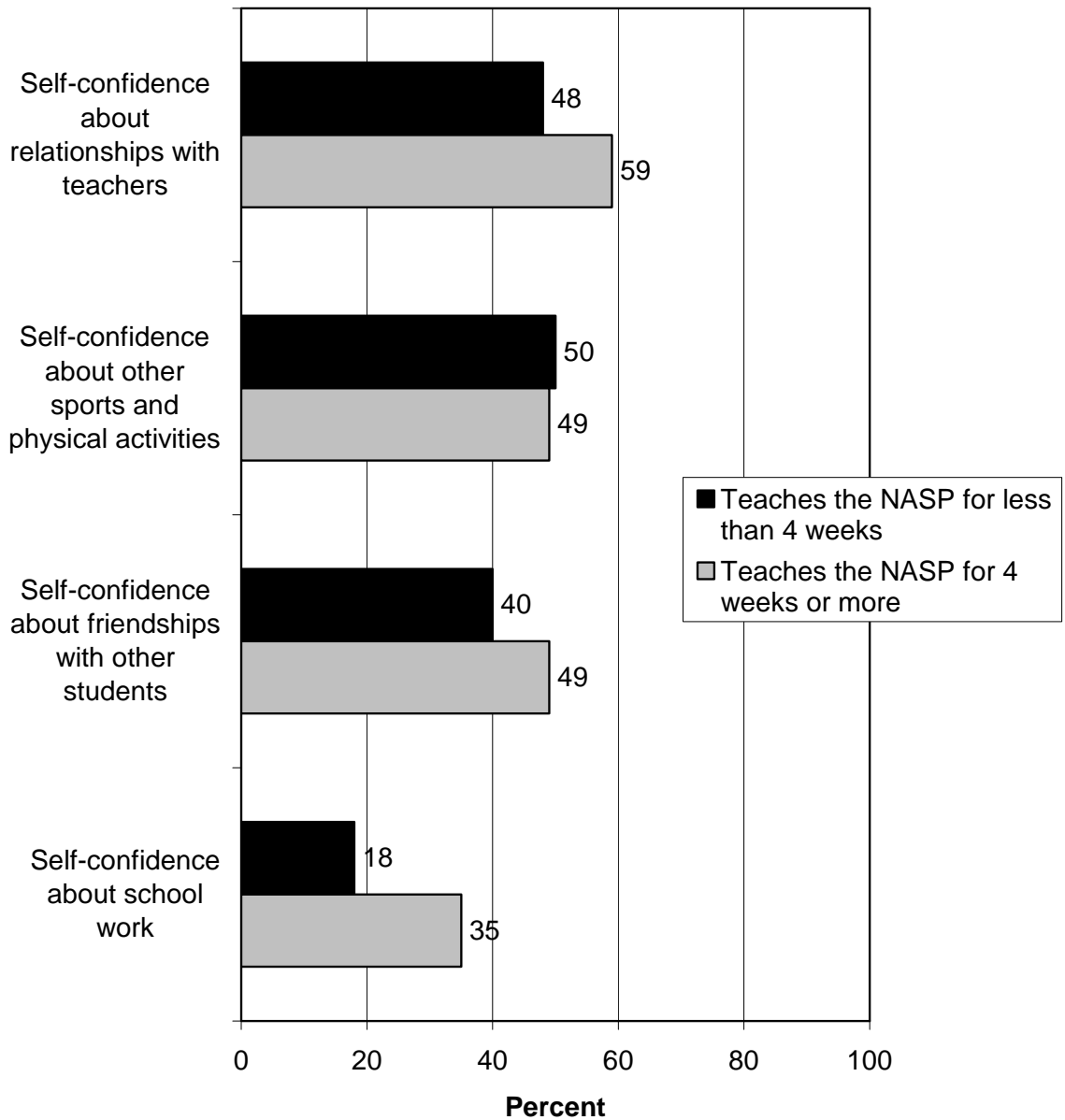
**Figure 23. Ratings of the effect on self-confidence by years of instructor experience teaching the NASP.**

The extent to which instructors reported that the NASP gives students more confidence was related to how long the NASP unit was offered. In general, instructors who offer more than 4-week units reported more effect on self-confidence.

**Table 6. Ratings of the Effect on Self-Confidence by Length of NASP Unit**

<b>Self-confidence about:</b>	<b>&lt; 4 weeks</b>	<b>&gt; 4 weeks</b>	<b>Significance</b>
Relationships with teachers	48%	59%	< .01
Other sports and physical activities	50%	49%	< .05
Friendships with other students	40%	49%	P=.162
School work	18%	35%	< .001

**Q33. Percent of areas in which the NASP gave students more self-confidence.**



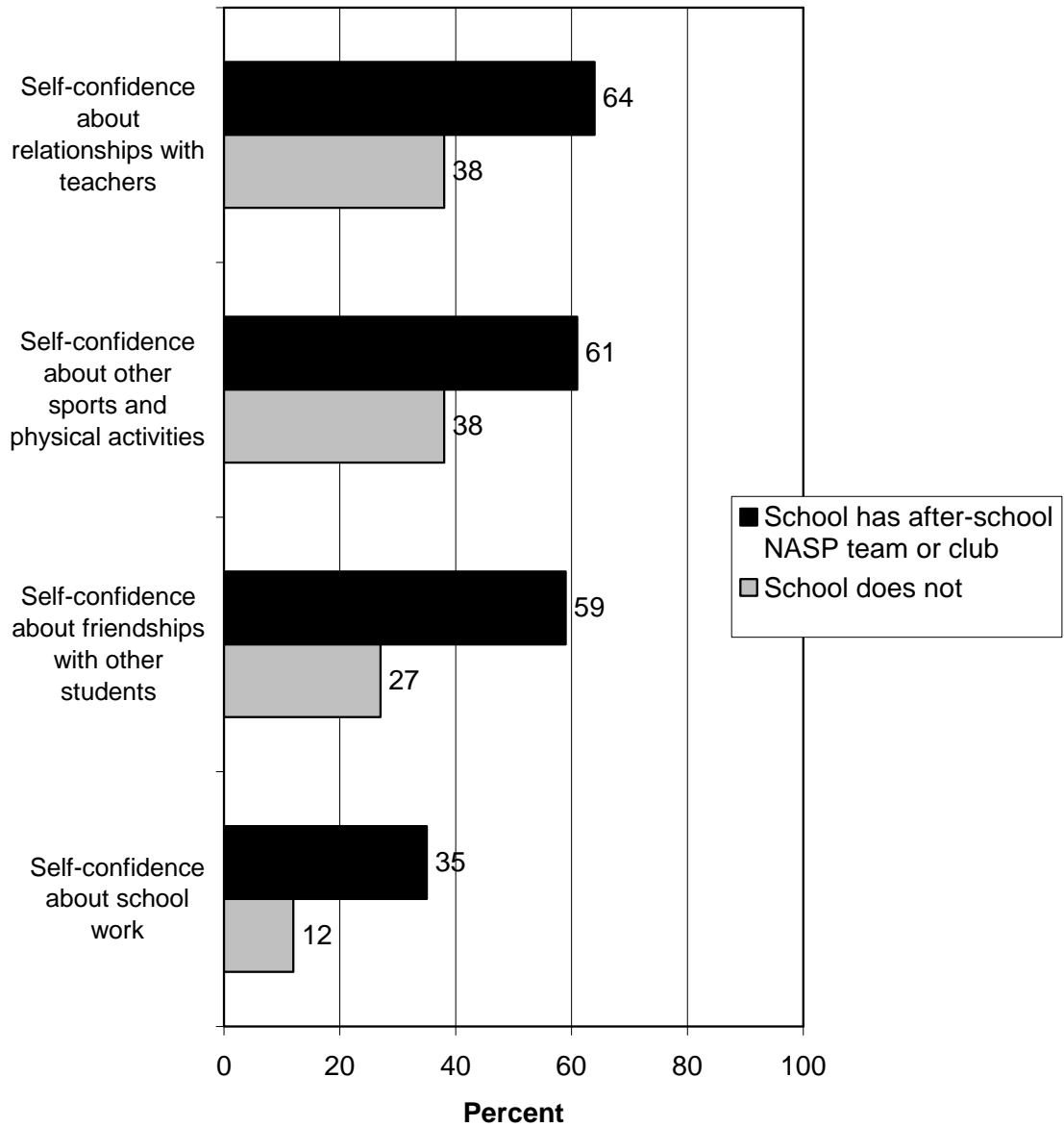
**Figure 24. Ratings of the effect on self-confidence by length of NASP unit.**

The extent to which instructors reported that the NASP gives students more confidence was related to whether they had a NASP after-school team or club. Where an after-school archery team or club was offered, instructors were significantly more likely to indicate that the NASP increased student self-confidence than instructors who indicated that they did not have an after-school archery team or club.

**Table 7. Ratings of Effect on Self-Confidence by Presence or Absence of an After-School Club**

<b>Self-confidence about:</b>	<b>No club</b>	<b>Club</b>	<b>Significance</b>
Relationships with teachers	38%	64%	<.001
Other sports and physical activities	38%	61%	<.001
Friendships with other students	27%	59%	<.001
School work	12%	35%	<.001

**Q33. Percent of instructors who agree that the NASP gave students more self-confidence in the following areas.**



**Figure 25. Ratings of the effect on self-confidence by presence or absence of an after-school club.**

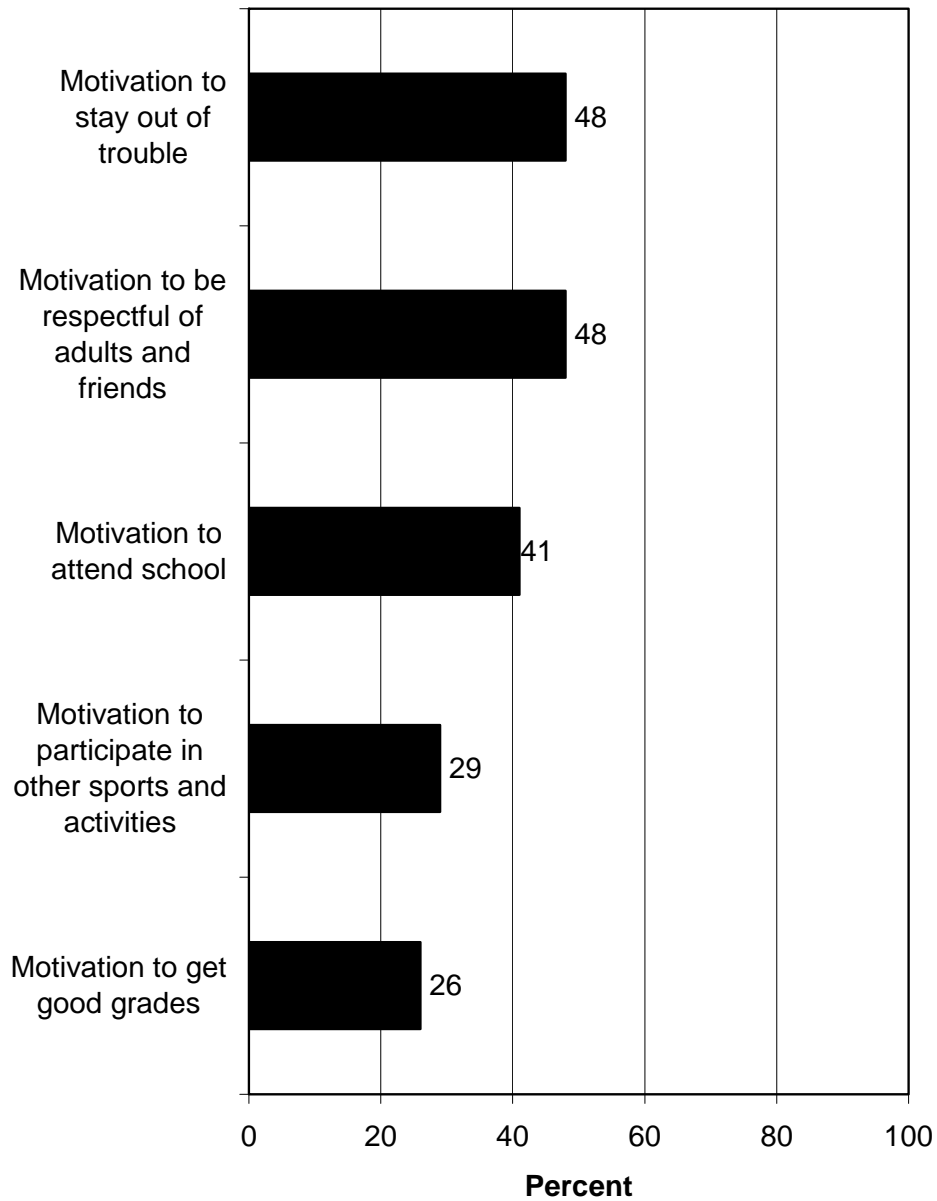
### ***Improve Motivation***

Instructors were asked about the ability of the NASP to give students more, the same, or less motivation in several areas. Nearly half of all instructors (48%) say the NASP gives students more motivation to stay out of trouble and to be respectful of adults and friends. Instructors also say that the NASP gives students more motivation to attend school (41%) and, to a lesser extent, to participate in other sports and activities (29%) and get good grades (26%).

**Table 8. *Effect of the NASP on Student Motivation***

<b>Motivation to:</b>	<b>Less (1)</b>	<b>Same (2)</b>	<b>More (3)</b>	<b>Average</b>
Stay out of trouble	<.5%	44%	48%	2.63
Be respectful of adults and friends	<.5%	42%	48%	2.62
Attend school	<.5%	32%	41%	2.56
Participate in other sports and activities	<.5%	29%	29%	2.40
Get good grades	<.5%	28%	26%	2.37

**Q34. Percent of instructors who agree that the NASP gave students more motivation in the following areas.**



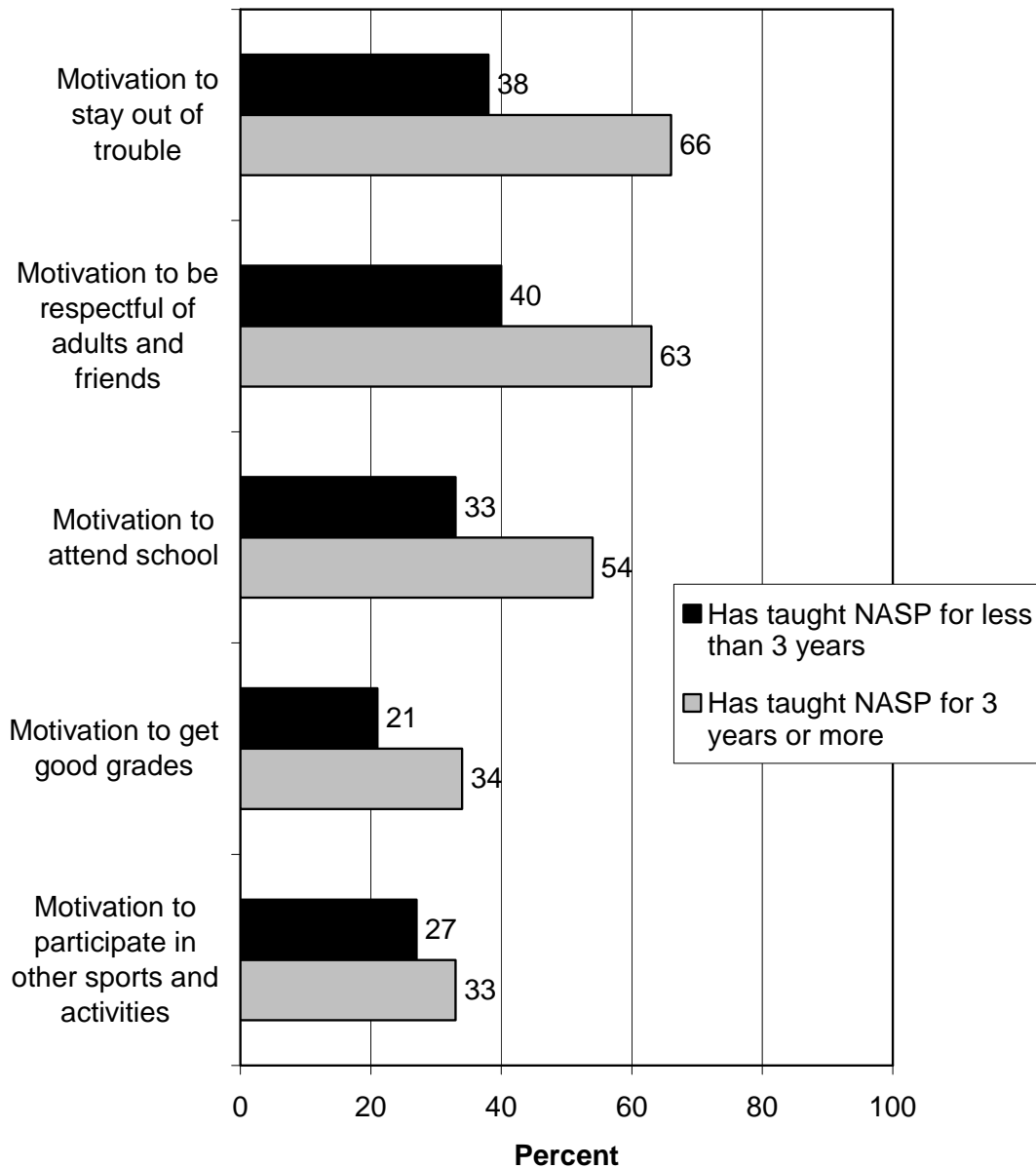
**Figure 26. Effect of the NASP on student motivation.**

As with their ratings of the effect of the NASP on self-confidence, the extent to which instructors reported that the NASP gives students more motivation was related to how many years they had been teaching the NASP. Teachers with more than 3 years of experience reported more effect on motivation. Sixty-six percent (66%) report that archery makes students more motivated to stay out of trouble. Sixty-three (63%) say participation in archery makes students more likely to be respectful of adults and friends, and 54% say it motivates them to attend school.

**Table 9. Ratings of the Effect on Motivation by Years of Instructor Experience Teaching the NASP**

<b>Motivation to:</b>	<b>&lt; 3 yrs</b>	<b>&gt; 3 yrs</b>	<b>Significance</b>
Stay out of trouble	38%	66%	<.001
Be respectful of adults and friends	40%	63%	<.001
Attend school	33%	54%	<.001
Participate in other sports and activities	27%	33%	$p = .212$
Get good grades	21%	34%	<.01

**Q34. Percent of instructors who agree that the NASP gave students more motivation in the following areas.**



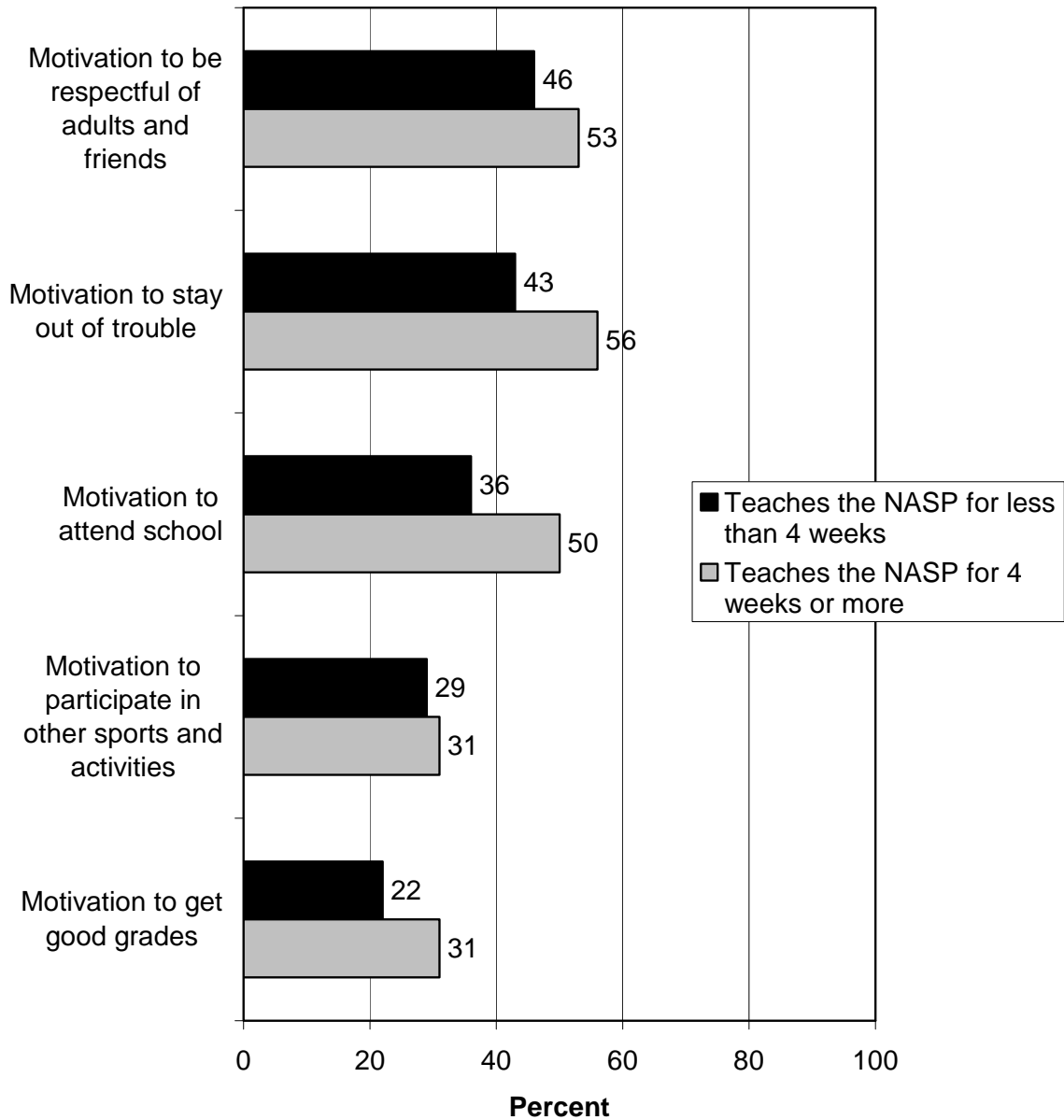
**Figure 27. Ratings of effect on student motivation by years of instructor experience teaching the NASP.**

As with self-confidence, the extent to which instructors reported that the NASP gives students more motivation was related to how long the NASP unit was offered. Instructors who offer more than 4-week units reported more effect on motivation.

**Table 10. Ratings of Effect on Motivation by Length of NASP Unit**

<b>Motivation to:</b>	<b>&lt; 4 wks</b>	<b>&gt; 4 wks</b>	<b>Significance</b>
Stay out of trouble	43%	56%	<0.5
Be respectful of adults and friends	46%	53%	p=.161
Attend school	36%	50%	<.01
Participate in other sports and activities	29%	31%	p=.736
Get good grades	22%	31%	p=.065

**Q34. Percent of instructors who agree that the NASP gave students more motivation in the following areas.**



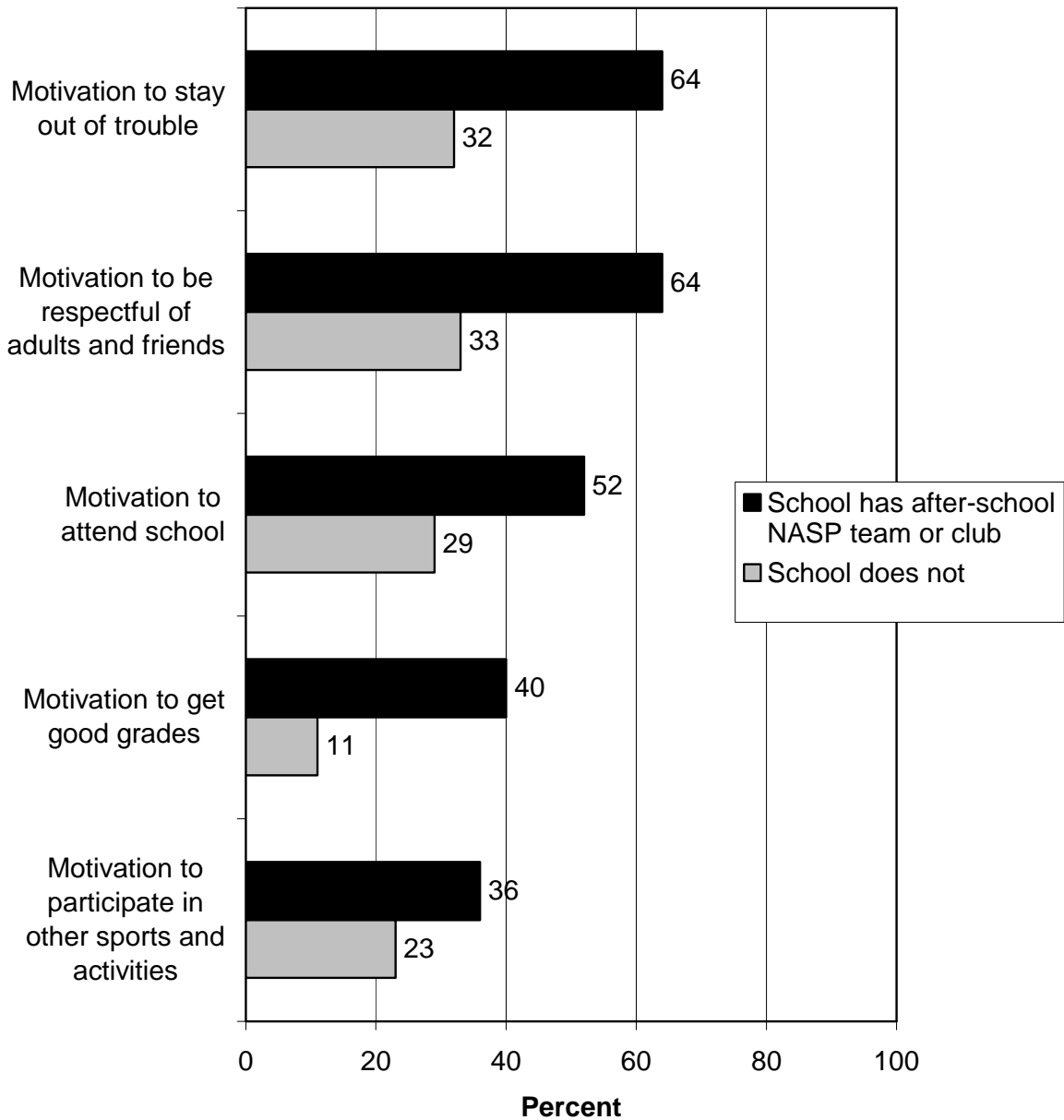
**Figure 28. Ratings of effect on motivation by length of NASP unit.**

The extent to which instructors reported that the NASP gave students more motivation was related to whether they had a NASP after-school team or club. Where a team or club was offered, instructors reported greater effects on student motivation.

**Table 11. *Ratings of Effect on Motivation by Presence or Absence of an After-School Club***

<b>Motivation to:</b>	<b>No club</b>	<b>Club</b>	<b>Significance</b>
Stay out of trouble	32%	64%	<.001
Be respectful of adults and friends	33%	64%	<.001
Attend school	29%	52%	<.001
Participate in other sports and activities	23%	36%	<.001
Get good grades	11%	40%	<.001

**Q34. Percent of instructors who agree that the NASP gave student more motivation in the following areas.**

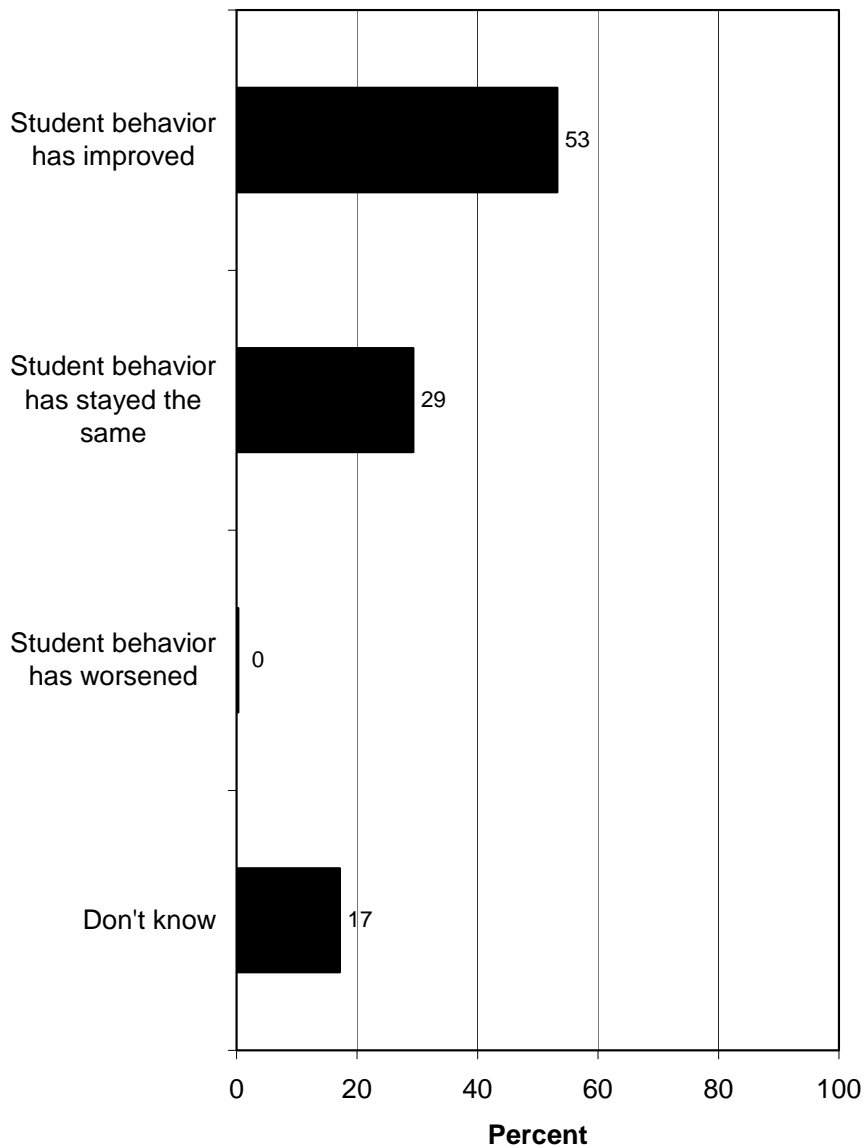


**Figure 29. Ratings of effect on motivation by presence or absence of an after-school club.**

*Improve Behavior and Learning Skills*

When asked how archery has affected student behavior as a whole, most instructors (53%) say that student behavior has improved. Over a quarter of instructors (29%) say that student behavior has stayed the same, and 17% say they do not know.

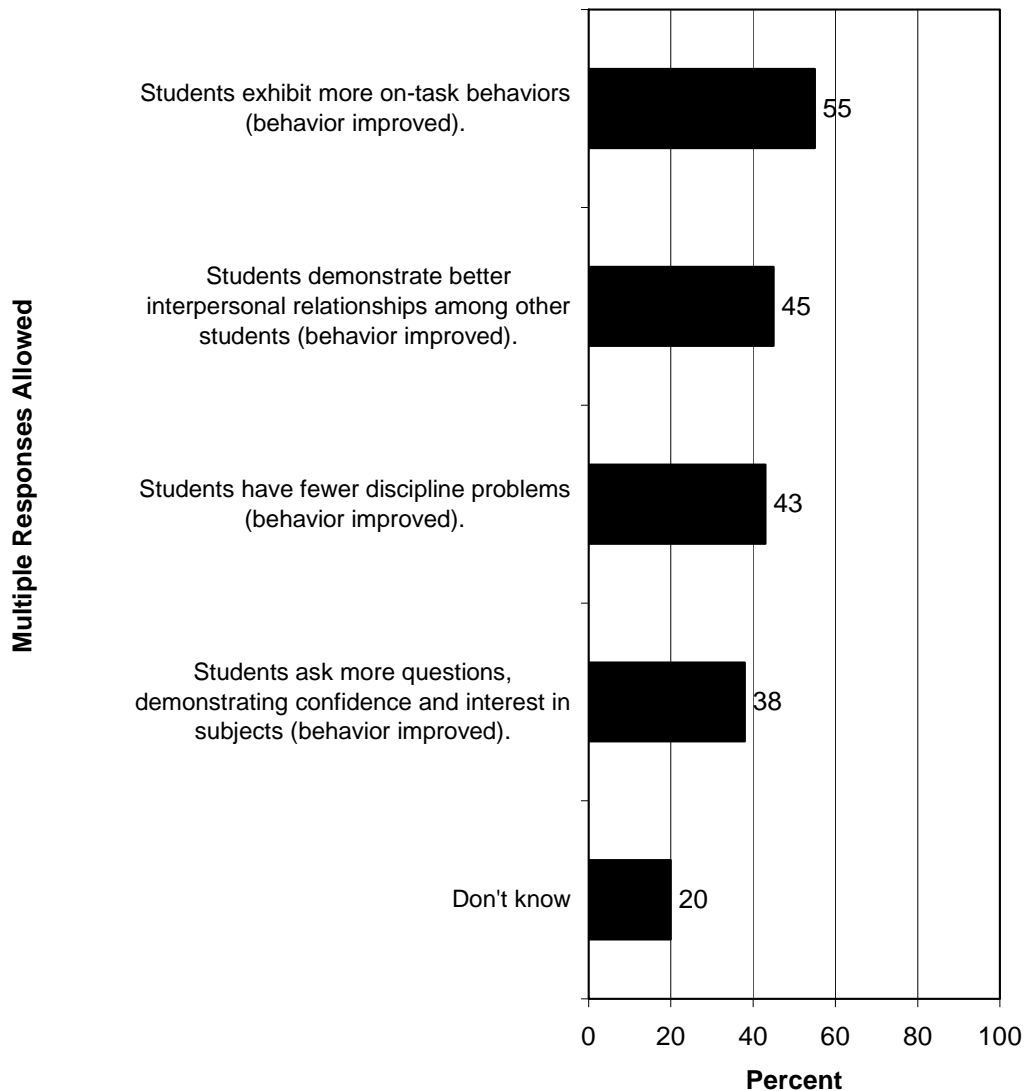
**Q26. How has archery affected student behavior as a whole?**



**Figure 30. Effect of the NASP on student behavior.**

When asked how the NASP affects specific areas of student behavior, a majority of instructors (55%) say that students exhibit more on-task behaviors. Otherwise, substantial percentages of instructors say that students demonstrate better interpersonal relationships (45%); that students have fewer discipline problems (43%); and that students ask more questions, demonstrating confidence and interest in subjects (38%).

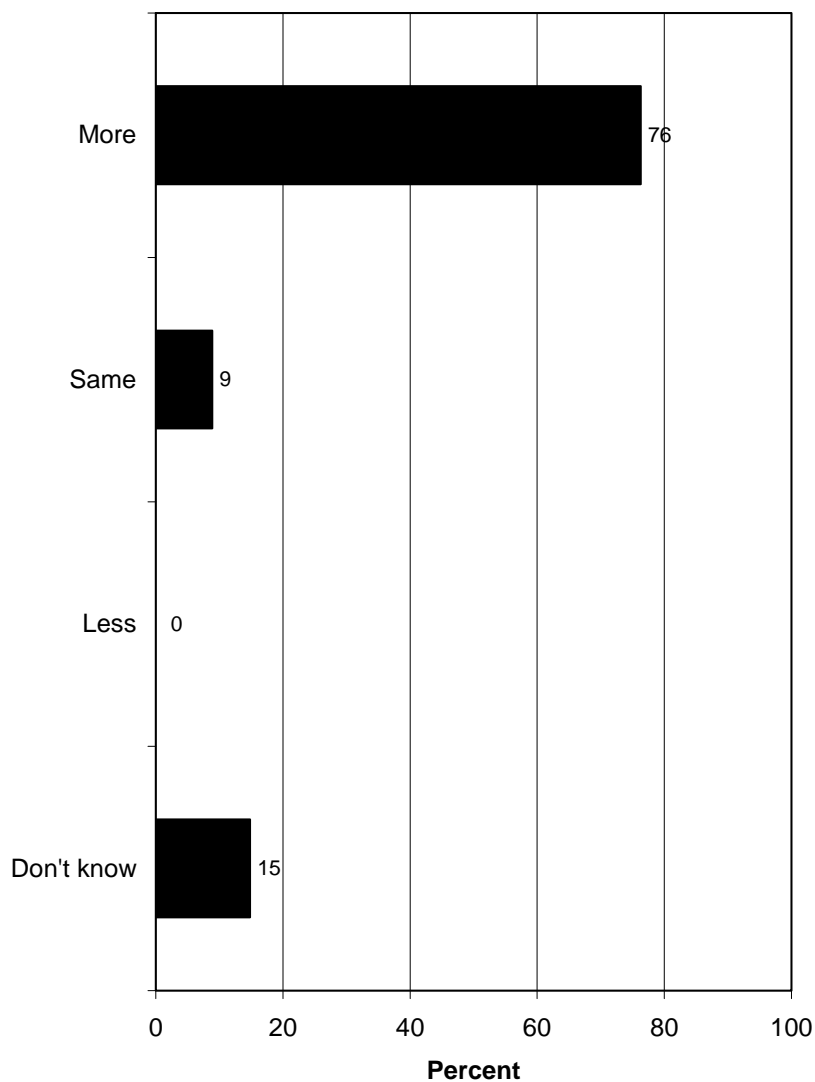
**Q27. How, specifically, do you think the NASP affects student behavior?**



**Figure 31. How the NASP affects student behavior.**

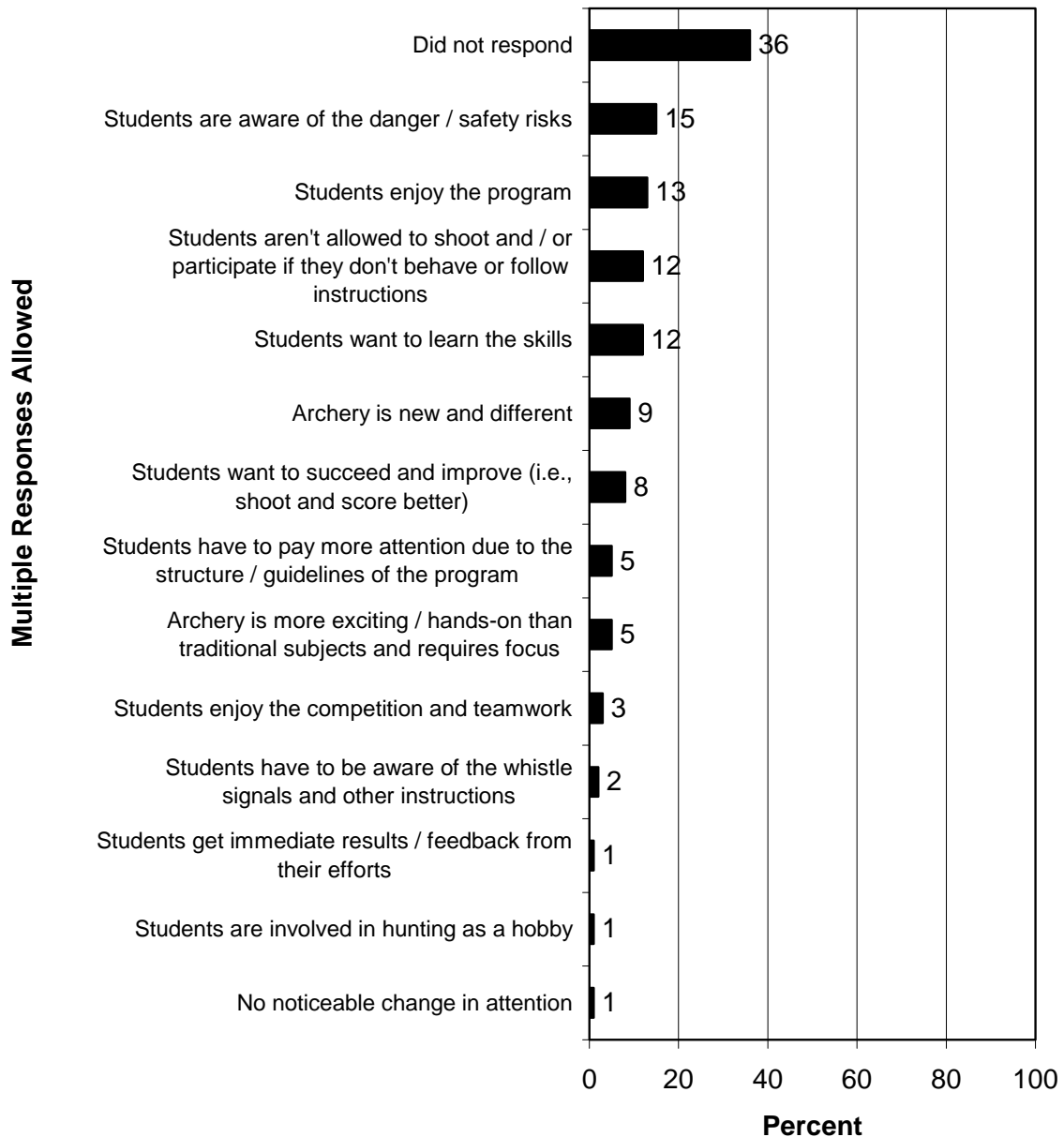
More than three-quarters of instructors (76%) believe that students pay more attention to what they are doing in NASP courses than in other classes. This is confirmed by the response to a later question where 76% of instructors indicate that they strongly or moderately agree that student concentration is improved by taking the NASP course. Instructors attribute this increased attention to safety needs, student enjoyment, the requirement to attend, and the desire to learn something new.

**Q28. Do you think students pay more, about the same, or less attention to what they are doing in the NASP archery course than in other classes?**



**Figure 32. Degree of student attention in the NASP compared with other classes.**

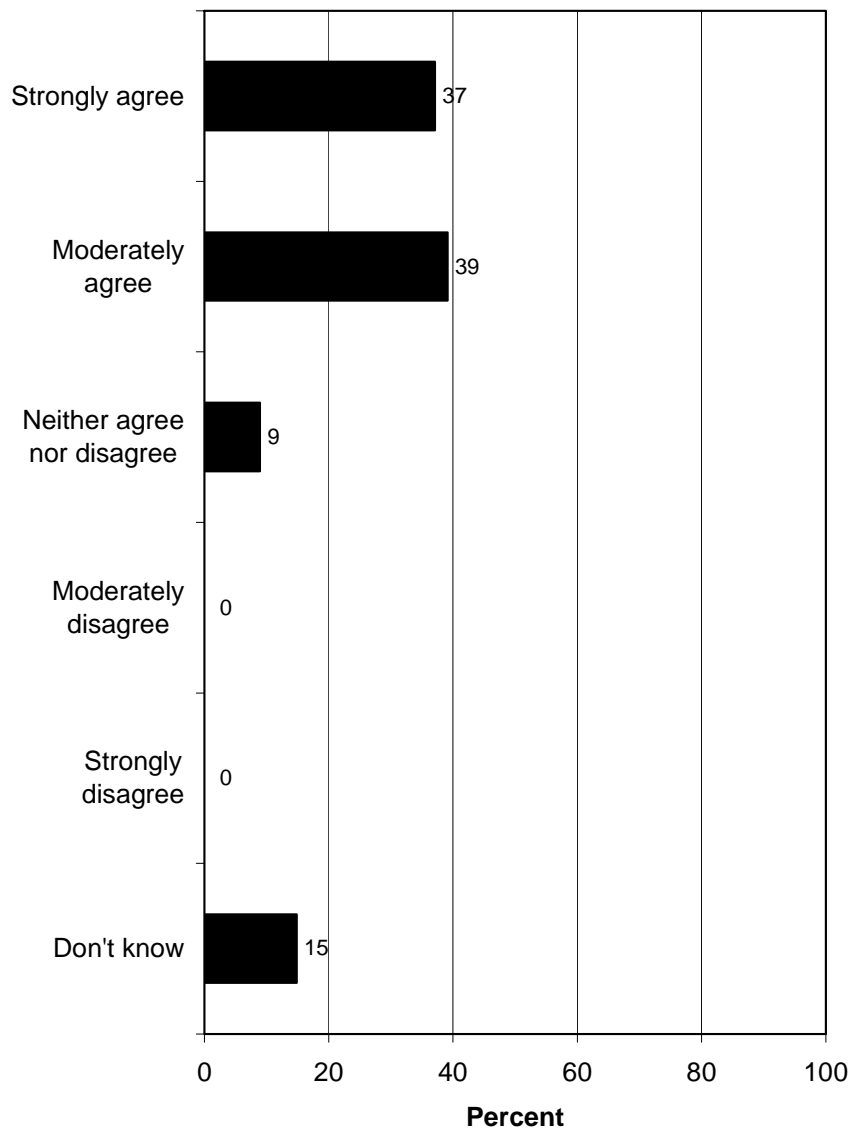
**Q29. Explain why you think students pay more, about the same, or less attention to what they are doing in the NASP archery course compared to other classes.**



**Figure 33. Reasons for the degree of student attention in the NASP.**

Seventy-six percent (76%) of instructors report that they agree (strongly or moderately) that the NASP improves concentration. Fifteen percent (15%) report that they did not know.

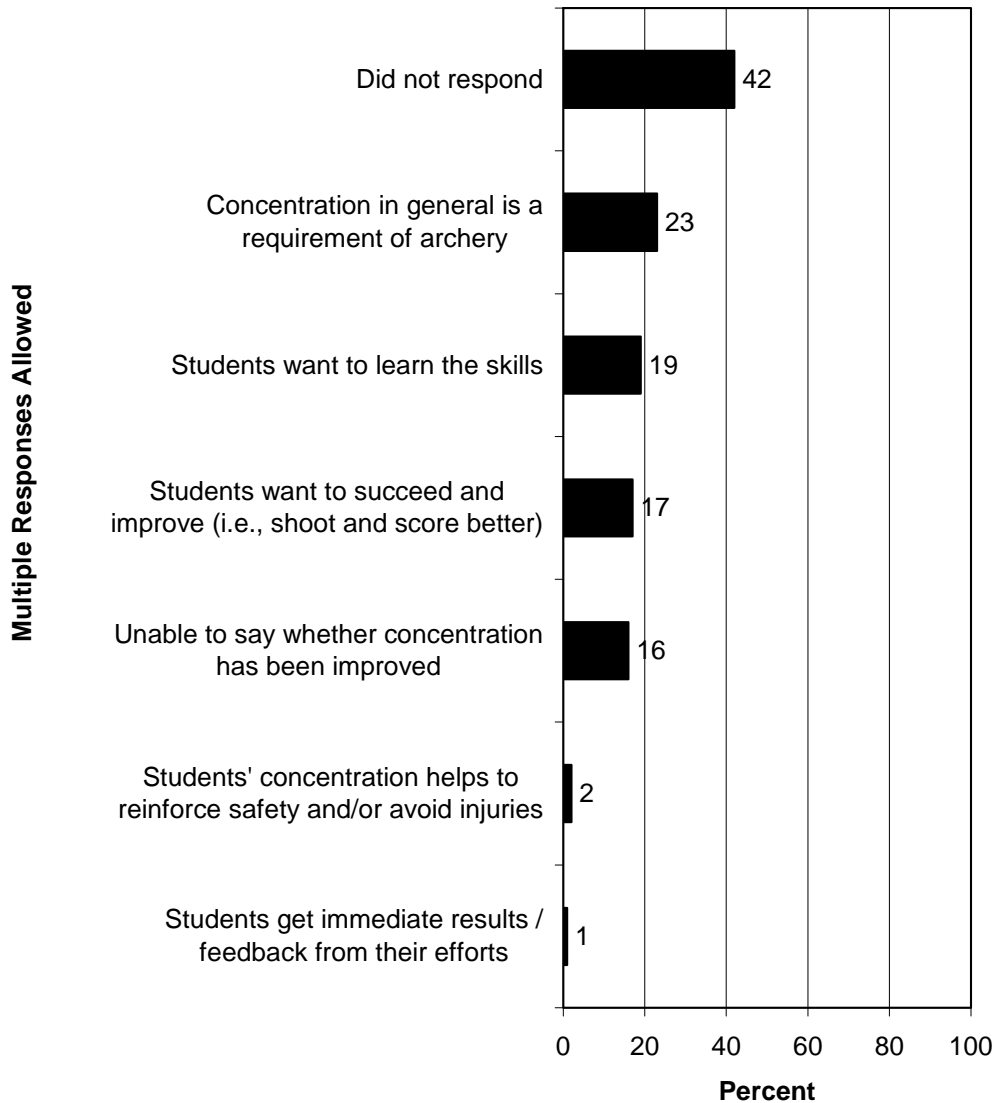
**Q30. Do you agree or disagree that student concentration is improved by taking the NASP archery course?**



**Figure 34. Extent to which instructors agree that the NASP improves concentration.**

When asked to explain their reasons for thinking that the NASP did or did not improve concentration, 42% of instructors did not respond. Twenty-three percent (23%) responded that concentration is a requirement of archery, and about one-fifth responded that students want to learn the skills (19%) or score/shoot better (17%). Another 16% responded that they could not say whether concentration had been improved.

**Q31. Explain why you agree or disagree that student concentration improves by taking the NASP archery course.**



**Figure 35. Reasons given for the extent the NASP improves concentration.**

Three factors were found to increase the effect of the NASP on learning skills and attitudes from the instructor perspective: 1) taking part in the NASP for more than 3 years; 2) teaching archery for 4 weeks or more; and 3) the presence of an after-school club. In other words, instructors who were implementing the program for more than 3 years were statistically significantly more positive in their responses about the effects of the NASP on student learning skills and attitudes. The same was true if they were teaching archery for more than 4 weeks or if the school offered an after-school club. Each of these variables was examined independently. Taken together, these findings suggest that high-level implementation of the program appears to have a significant positive effect on student learning skills and attitudes. According to the instructors surveyed, varying levels of implementation appear to have a significant positive effect on student self-confidence, motivation, behavior, and attitudes. These conditions include 1) taking part in the NASP for more than 3 years and teaching archery for 4 weeks or more; 2) taking part in the NASP for more than 3 years and the presence of an after-school club; 3) teaching archery for 4 weeks or more and the presence of an after-school club; 4) taking part in the NASP for more than 3 years, teaching archery for 4 weeks or more, and the presence of an after-school club. There was only one exception among these conditions: among teachers who have taken part in the NASP for more than 3 years, taught archery for 4 weeks or longer at a time, and have an after-school club, the perceived positive impact on student concentration and focus was not statistically significant.

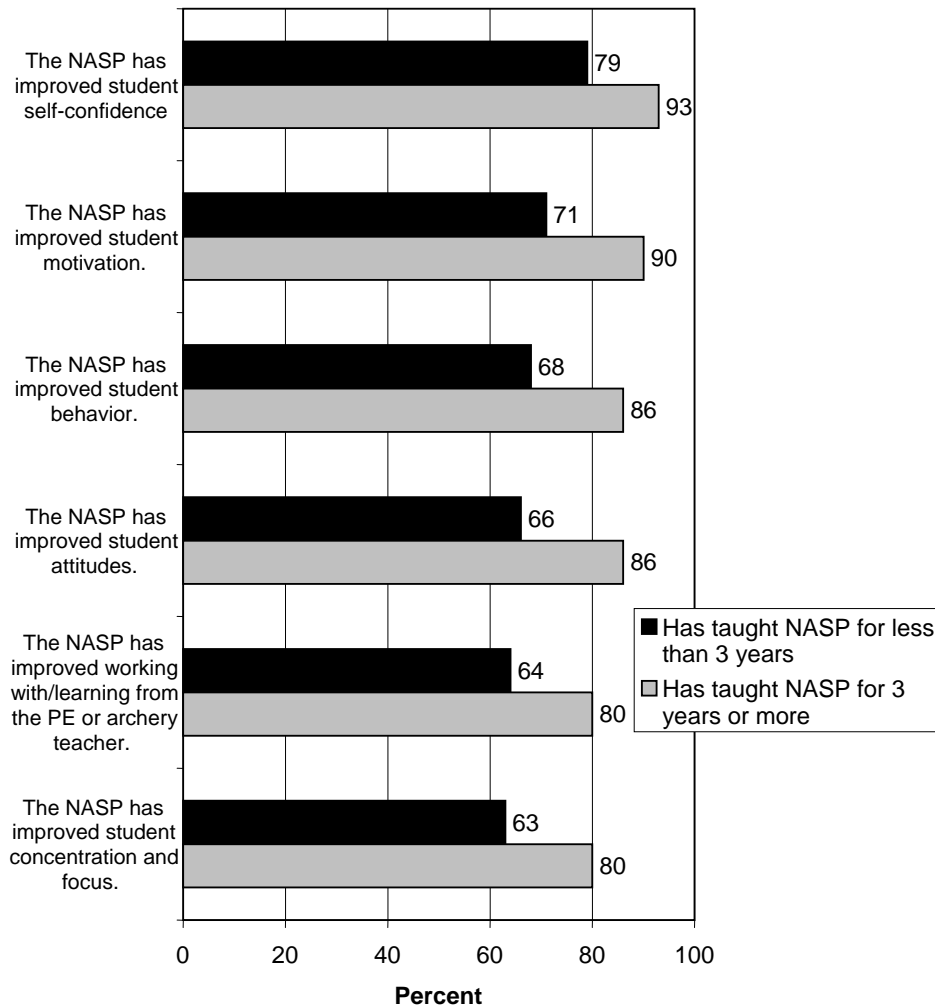
**Table 12. Significance Level for Combined Factors of Instructor Experience, Length of Archery Training for Students and After-School Club Offerings on Perceived Positive Effects on Outputs for Students**

<b>Improvements in:</b>	<b>&gt; 3 years and &gt; 4 weeks</b>	<b>&gt; 3 years and club</b>	<b>&gt;4 weeks and club</b>	<b>&gt; 3 years, &gt;4 weeks, and club</b>
Student self-confidence	<.001	<.001	<.01	<.01
Student motivation	<.01	<.001	<.01	<.05
Student behavior	<.001	<.001	<.001	<.001
Student attitudes	<.001	<.001	<.001	<.05
Working with/learning from the PE or archery teacher	<.05	<.001	<.05	<.05
Student concentration and focus	<.05	<.001	<.01	<i>p</i> = .154

**Table 13. Ratings of the Effect on Student Learning Skills and Attitudes by Years of Instructor Experience Teaching the NASP**

<b>Improvements in:</b>	<b>&lt; 3 years</b>	<b>&gt; 3 years</b>	<b>Significance</b>
Student self-confidence	79%	93%	< .001
Student motivation	71%	90%	< .001
Student behavior	68%	86%	< .001
Student attitudes	66%	86%	< .001
Working with/learning from the PE or archery teacher	64%	80%	< .001
Student concentration and focus	63%	80%	< .001

**Q15. Percent of instructors who moderately or strongly agree with the following statements, based on their experiences teaching the program.**

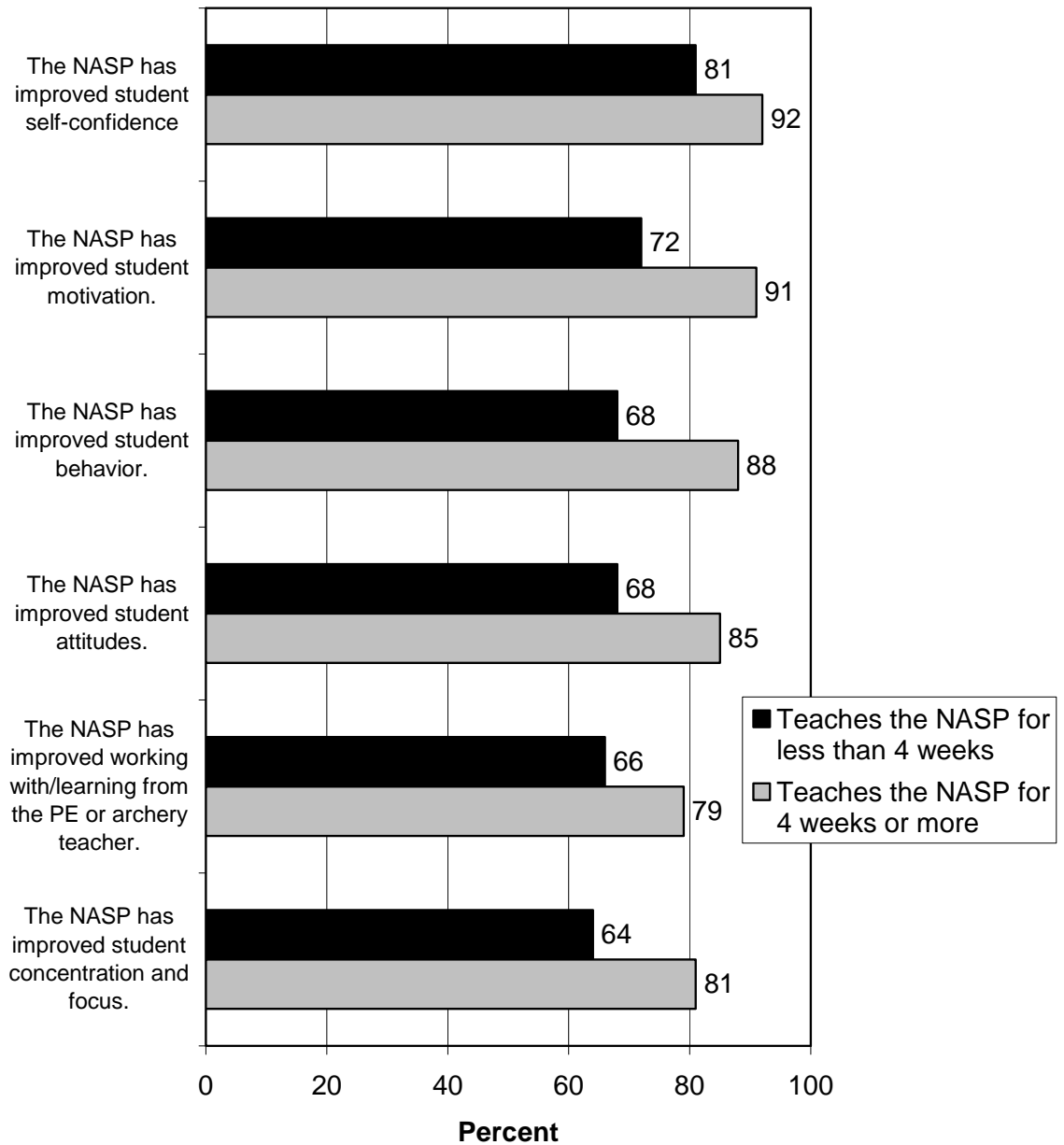


**Figure 36. Ratings of the effect on student learning skills and attitudes by years of instructor experience teaching the NASP.**

**Table 14. Ratings of the Effect on Student Learning Skills and Attitudes by Length of NASP Unit**

<b>Improvements in:</b>	<b>&lt;4 weeks</b>	<b>&gt; 4 weeks</b>	<b>Significance</b>
Student self-confidence	81%	92%	< .01
Student motivation	72%	91%	< .001
Student behavior	68%	88%	< .001
Student attitudes	68%	85%	< .001
Working with/learning from the PE or archery teacher	66%	79%	< .05
Student concentration and focus	64%	81%	< .001

**Q15. Percent of instructors who moderately or strongly agree with the following statements, based on their experiences teaching the program.**

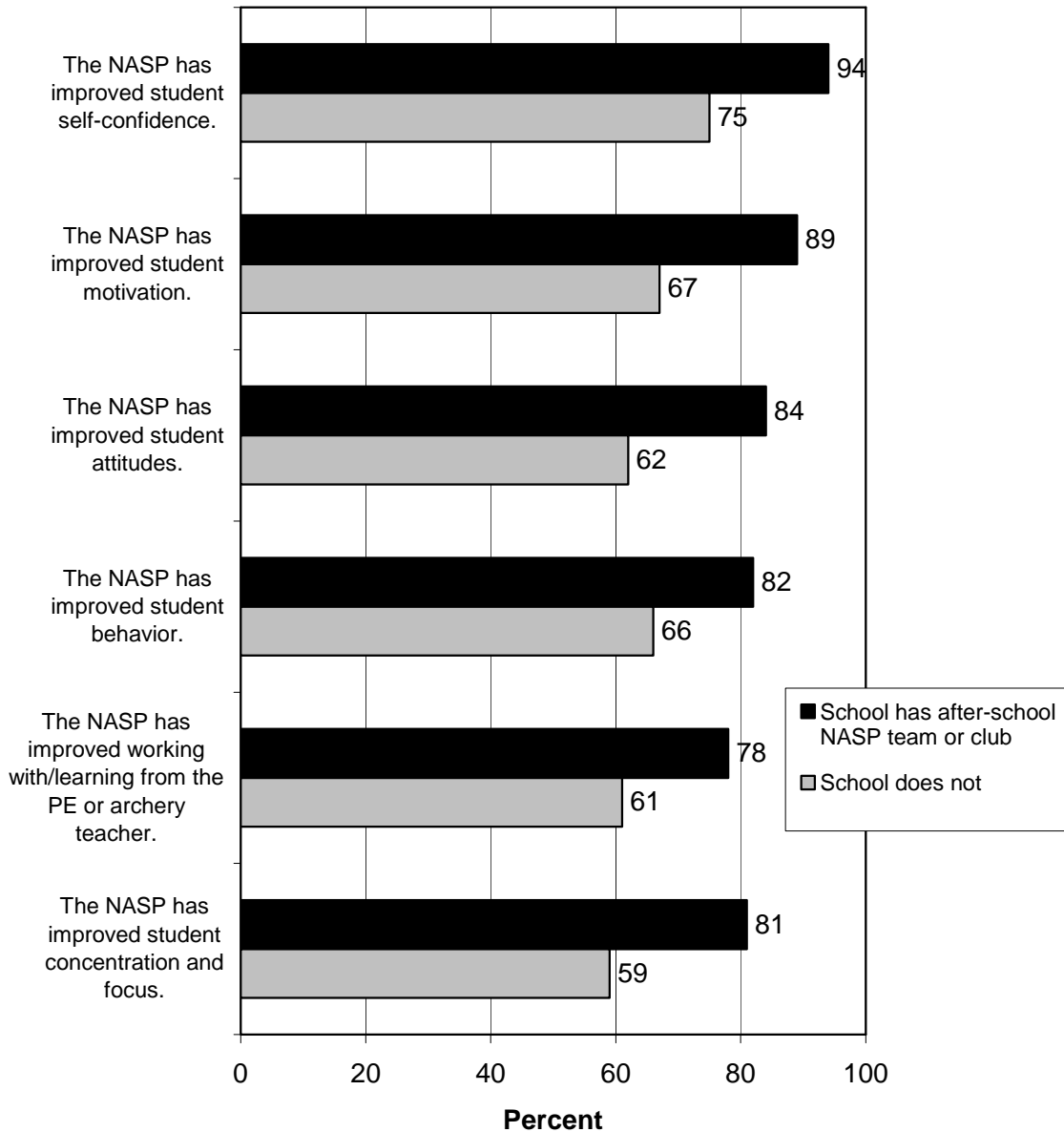


**Figure 37. Ratings of the effect on student learning skills and attitudes by length of NASP unit.**

**Table 15. Ratings of the Effect on Student Learning Skills and Attitudes by Presence or Absence of an After-School Club**

<b>Improvements in:</b>	<b>No club</b>	<b>Club</b>	<b>Significance</b>
Student self-confidence	75%	94%	< .001
Student motivation	67%	89%	< .001
Student behavior	62%	84%	< .001
Student attitudes	66%	82%	< .001
Working with/learning from the PE or archery teacher	61%	78%	< .001
Student concentration and focus	59%	81%	< .001

**Q15. Percent of instructors who moderately or strongly agree with the following statements, based on their experiences teaching the program.**



**Figure 38. Ratings of the effect on student learning skills and attitudes by presence or absence of an after-school club.**

## **Conclusions about Hypothesis 2: Through the NASP, Students Develop Learning Skills and Attitudes**

These data show that most instructors believe that the NASP positively affects student learning skills and attitudes.

***Archery Improves Student Self-Confidence.*** Eighty-four percent (84%) of instructors agree that archery has improved their students' self-confidence. Instructors with more than 3 years of experience with the NASP (93% versus 79%), who taught it for more than 4 weeks (92% versus 81%), or who had an archery club at their school (94% versus 75%), were significantly more likely to agree that archery improves student self-confidence. When asked about specific areas of self-confidence that are affected, instructors reported that archery gives students more confidence in their relationships with their teachers (51%), in other sports or physical activities (50%), and, to a lesser extent, in friendships with other students (43%). Twenty-four percent (24%) reported that archery gives students more self-confidence in their schoolwork.

***Archery Improves Student Motivation.*** Seventy-eight percent (78%) of instructors agree that archery has improved their students' motivation. As with their ratings of the effect of the NASP on self-confidence, the extent to which instructors reported that the NASP gave students more motivation was related to how many years they had been teaching the NASP (90% versus 71%), if they taught it for 4 weeks or more (91% versus 72%), and if they have an after-school club (89% versus 67%). Their ratings were statistically significantly higher. When asked about specific areas, nearly half of all instructors (48%) say the NASP gives students more motivation to stay out of trouble and to be respectful of adults and friends. Instructors also say that the NASP gives students more motivation to attend school (41%), and to a lesser extent to participate in other sports and activities (29%) and to get good grades (26%).

***Archery Improves Student Behavior.*** The majority of PE instructors (74%) agree that archery has improved student behavior. When disaggregated, instructors with more than 3 years of experience with the NASP (86% versus 68%), who taught it for more than 4 weeks (88% versus 68%), or who had an archery club at their school (82% versus 66%) were significantly more likely to agree that archery improves student behavior than instructors who did not share these characteristics. When asked how the NASP affects specific areas of student behavior, more than half of instructors (55%) say that students exhibit more on-task behaviors. Other areas in which substantial percentages of instructors report specific effects are interpersonal relationships (45%); fewer discipline problems (43%); and students asking more questions and demonstrating confidence and interest in subjects (38%).

***Archery Improves Student Attitudes.*** Seventy-three percent (73%) of instructors agree that archery has improved their students' attitudes. As with the other areas, instructors with more than 3 years of experience with the NASP (86% versus 66%), who taught it for more than 4 weeks (85% versus 68%), or who had an archery club at their school (84% versus 62%) were significantly more likely to agree that archery improves student attitudes.

***Archery Improves Student Interpersonal Relationships.*** Seventy percent (70%) of instructors agree that archery has improved their students' working relationship with the PE or archery teacher. Again, instructors with more than 3 years of experience with the NASP (80% versus 64%), who taught it for more than 4 weeks (79% versus 66%), or who had an archery club at their school (78% versus 61%) were significantly more likely to agree that archery improves student interpersonal relationships.

***Archery Improves Student Concentration and Focus.*** When asked specifically about student attention in archery, 76% of PE instructors believe that students pay more attention to what they are doing in NASP courses than in other classes. In another item when given the statement, "The NASP has improved student concentration and focus," 70% of instructors report that they agree with this statement. As with the other areas, instructors with more than 3 years of experience with the NASP (80% versus 63%), who taught it for more than 4 weeks (81% versus 64%), or who had an archery club at their school (81% versus 59%) were significantly more likely to agree that archery improves student concentration and focus. Instructors attribute this increased level of attention primarily to six factors: 1) students are aware of the safety risks (15%); 2) students enjoy the program (13%); 3) students aren't allowed to shoot if they don't follow instructions (12%); 4) students want to learn new skills (12%); 5) archery is new and different (9%); and 6) students want to score better (8%).

### ***Summary of Evidence for the Effects on Student Learning Skills and Attitudes***

The findings in this section provide evidence that the NASP has a positive effect on students. Across these output effects on learning skills and attitudes, approximately three quarters of instructors agreed that the NASP affects student self-confidence, motivation, attitudes, working relationship with the PE teacher, and concentration and focus. Slightly more than half also report that the NASP improves behavior. Furthermore, the more experienced instructors, the ones who teach it for more than 4 weeks and those who have after-school clubs, are the most convinced of its effects. Further, the more experienced instructors, those who teach it for more than 4 weeks, and those who have after school clubs are most convinced of the program's impact on student skills and attitudes.

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*"I especially like the way archery can be used with handicapped students, giving them the confidence and the interest in a sport they can enjoy."*

~ Michigan Instructor

*"Archery is all about focus. Students concentrate on the archery process (form/technique) to make them better. They also understand the importance of safety. In order to stay safe, they all pay attention."*

~ Ohio Instructor

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### **Hypothesis 3: Archery Positively Affects Student Attendance and Performance in PE and School and Their Interest in Archery and Other Sports**

The effects on performance and attendance build on student engagement and instructor satisfaction with the program and instructors see positive effects on student learning skills and behaviors. For this hypothesis, instructors were asked to report on their observations of student attendance and performance, in both their own PE classes and in school in general. They also reported on the effect of offering archery on subsequent student interest and involvement in archery and other sports.

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*“I have seen students change their behavior 180 degrees in this unit. I work in an archery shop and since the class I have noticed an increase of students coming in with parents getting them involved in archery also.”*

~ Minnesota Instructor

*“In the past I have had some challenging students that had great difficulty concentrating, following direction, and staying on task. When they were doing NASP, they were able to focus and experience success at something they were attempting.”*

~Kentucky Instructor

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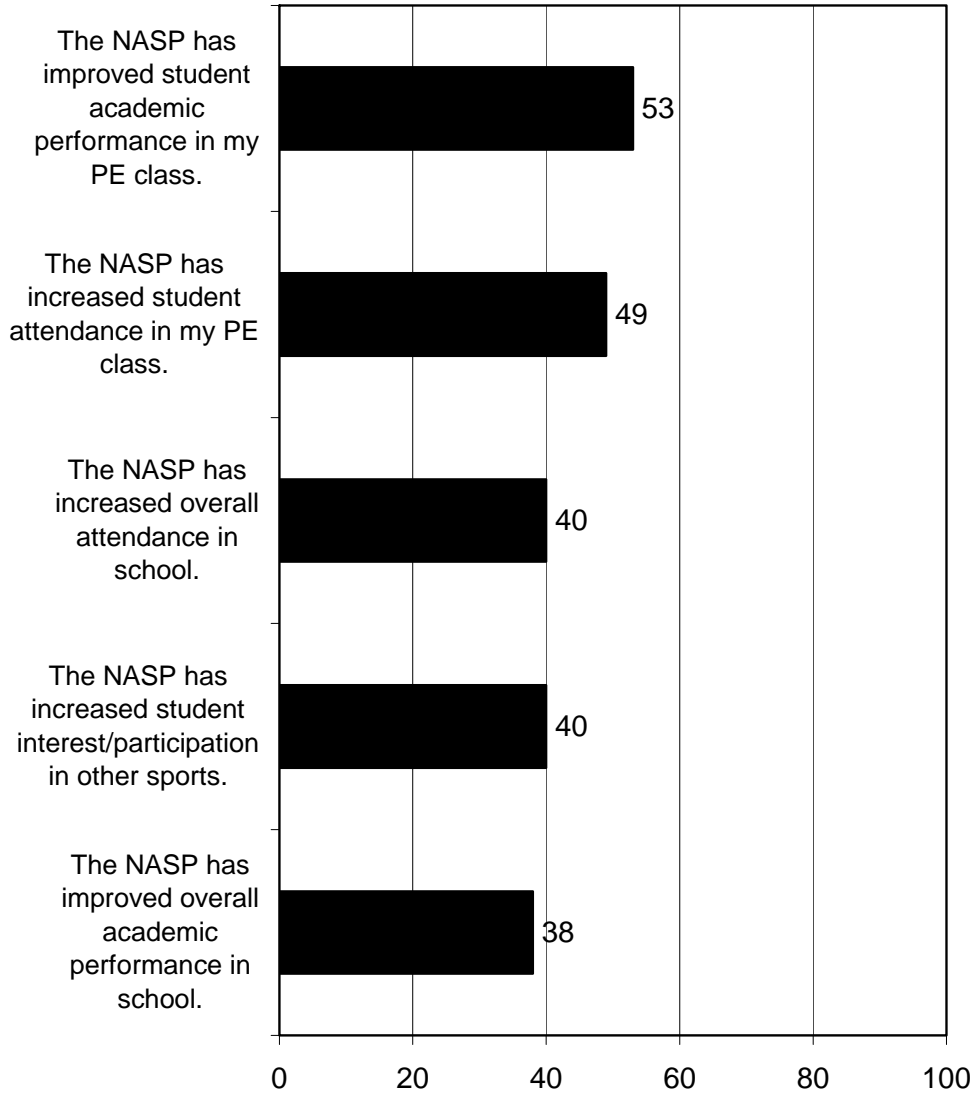
***Improve Attendance and Performance in PE and in School and Increase Their Interest/Participation in Sports***

The majority of instructors agree that the NASP has improved academic performance in PE class (53%), attendance in PE class (49%), student attendance in school (40%), interest in other sports (40%), and academic performance in school (38%).

**Table 16. Ratings of Effect on Student Attendance in School and PE, Academic Performance in School and PE, and Interest/Participation in Sports**

	<b>Strongly agree (5)</b>	<b>Moderately agree (4)</b>	<b>Neither agree nor disagree (3)</b>	<b>Moderately disagree (2)</b>	<b>Strongly disagree (1)</b>	<b>Average</b>
Academic performance in PE class	21.2%	32.1%	25.5%	0.5%	0.5%	3.92
Attendance in PE class	18.9%	29.8%	28.0%	0.3%	1.3%	3.83
Attendance in school	12.8%	27.3%	36.8%	1.8%	1.5%	3.60
Interest in other sports	14.3%	26.0%	36.8%	2.5%	0.5%	3.64
Academic performance in school	11.9%	26.5%	38.9%	0.3%	0.8%	3.62

**Q15. Percent of instructors who moderately or strongly agree with the following statements, based on their experiences teaching the program.**

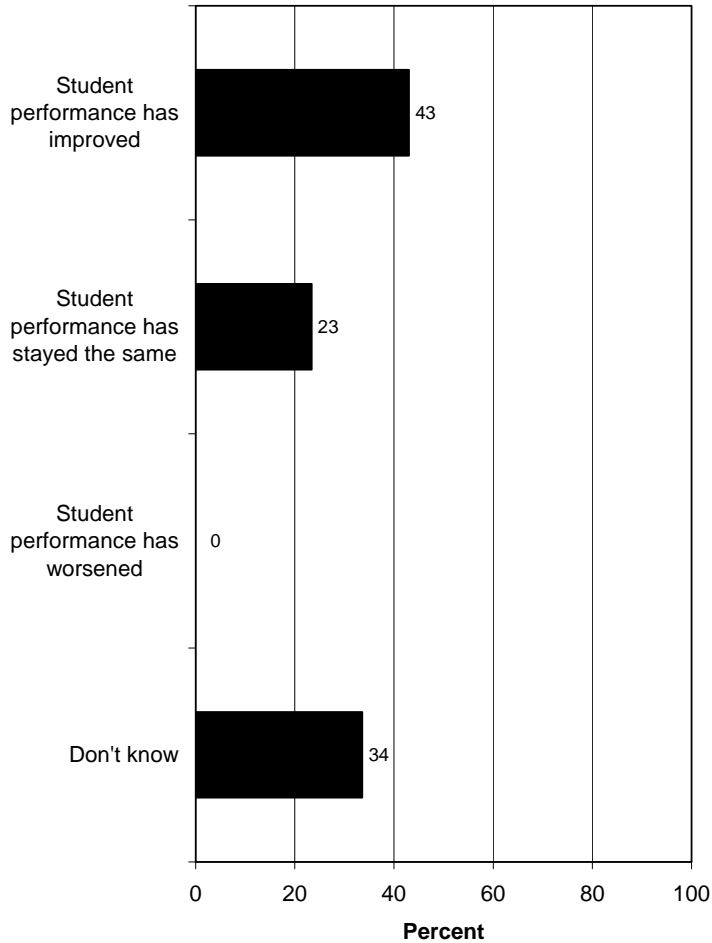


**Figure 39. Ratings of the effect on student attendance in school and PE, academic performance in school and PE, and interest/participation in sports.**

***Improve Academic Performance in PE and in School***

When asked how archery has affected student academic performance in PE class, instructors most commonly say that student performance has improved (43%). Meanwhile, nearly a quarter of instructors (23%) say that student performance in PE class has stayed the same, and more than a third (34%) say that they do not know. The average response was 2.65 on a scale of 1 to 3. Teachers who have taught the NASP course for 3 or more years and those who teach the course for 4 weeks or longer are more likely to believe that archery impacts student academic performance in PE class. There is no significant difference between teachers who are involved with the program where an after-school club is available and those who are not.

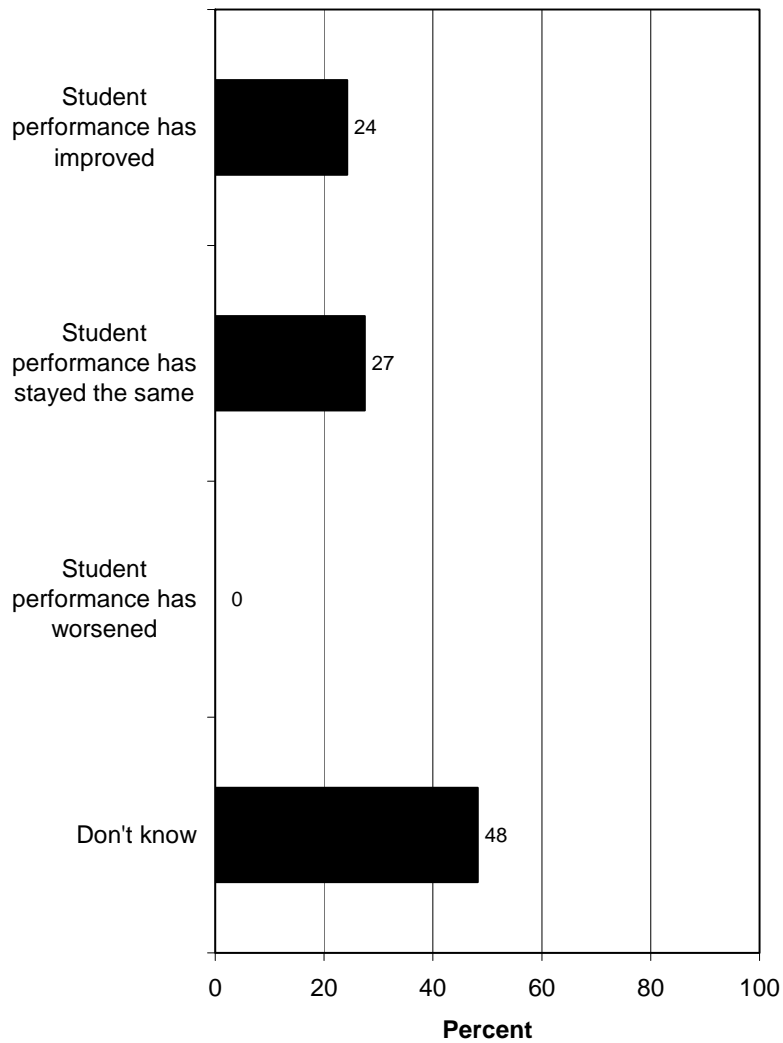
**Q24. How has archery affected student academic performance in PE class?**



**Figure 40. Effect of NASP on performance in PE class.**

When asked how the NASP has affected student academic performance, instructors most commonly say that they do not know (48%). Twenty-four percent (24%) say that student performance has improved, and 27% say that student performance has stayed the same. The average response was 2.47 on a scale of 1 to 3. Teachers who have taught the NASP course for 3 or more years along with those who teach the course for 4 weeks or longer and those who teach at a school where archery is offered as an after-school program were more likely to believe that archery impacts students' overall academic performance in school.

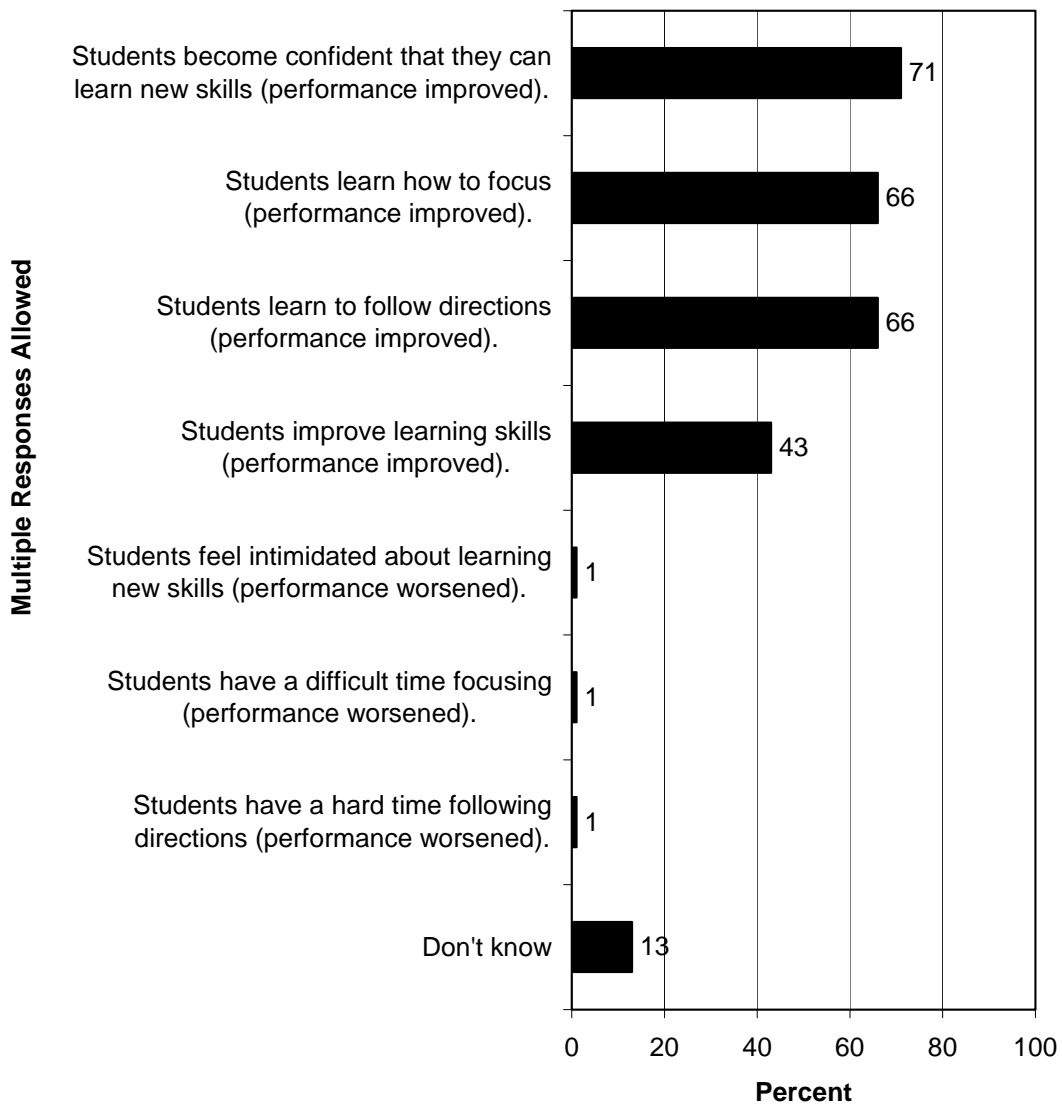
**Q23. How has the NASP affected overall student academic performance in school?**



**Figure 41. Effect of NASP on overall academic performance.**

Instructors were asked how they thought the NASP specifically affects student performance, and the most common responses regarding the ability of the NASP to improve performance were that students become confident that they can learn new skills (71%), that students learn how to focus (66%), that students learn to follow directions (66%), and that students improve learning skills (43%).

**Q25. What, specifically, about the program do you think affects student performance?**

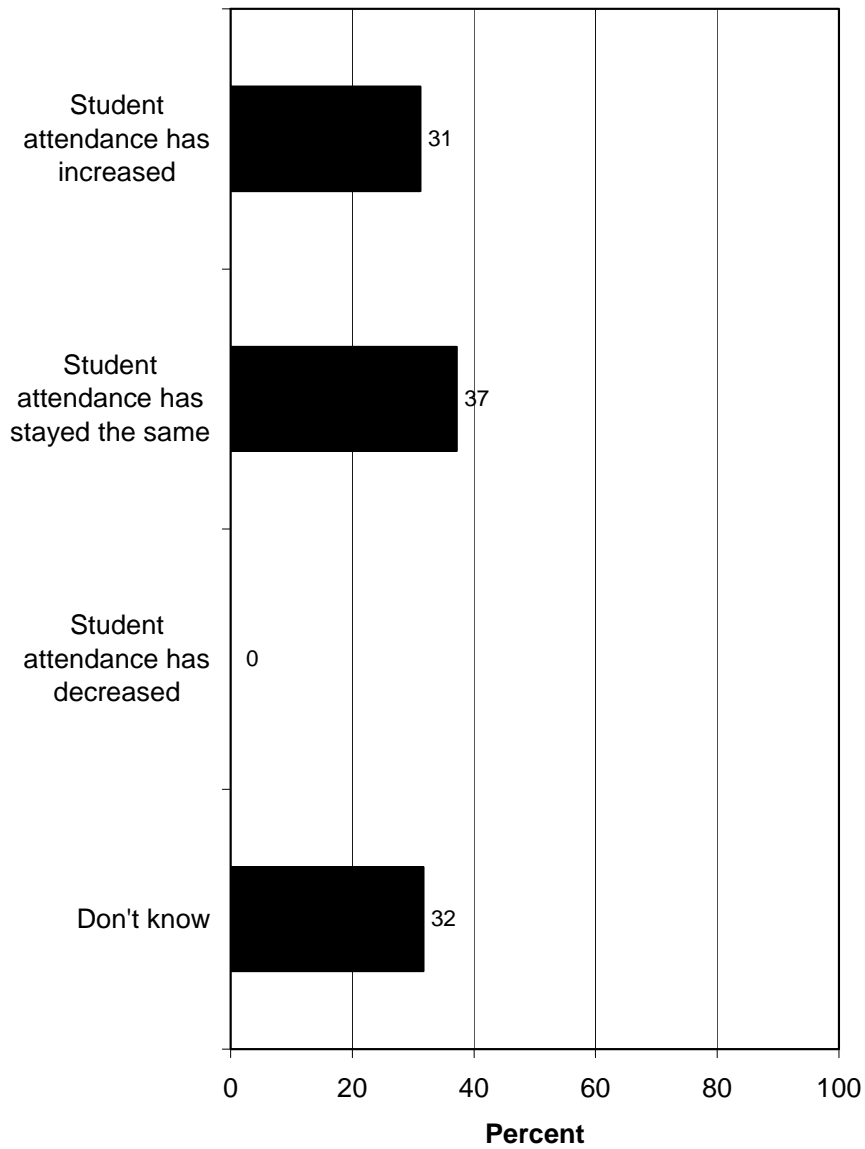


**Figure 42. How the NASP affects student performance.**

*Improve Student Attendance in PE and in School*

When asked how the NASP has affected student attendance in PE class, instructors most commonly say that student attendance has stayed the same (37%). Roughly a third (31%) say that student attendance in PE class has increased, while 32% say that they do not know. The average response was 2.46 on a scale of 1 to 3.

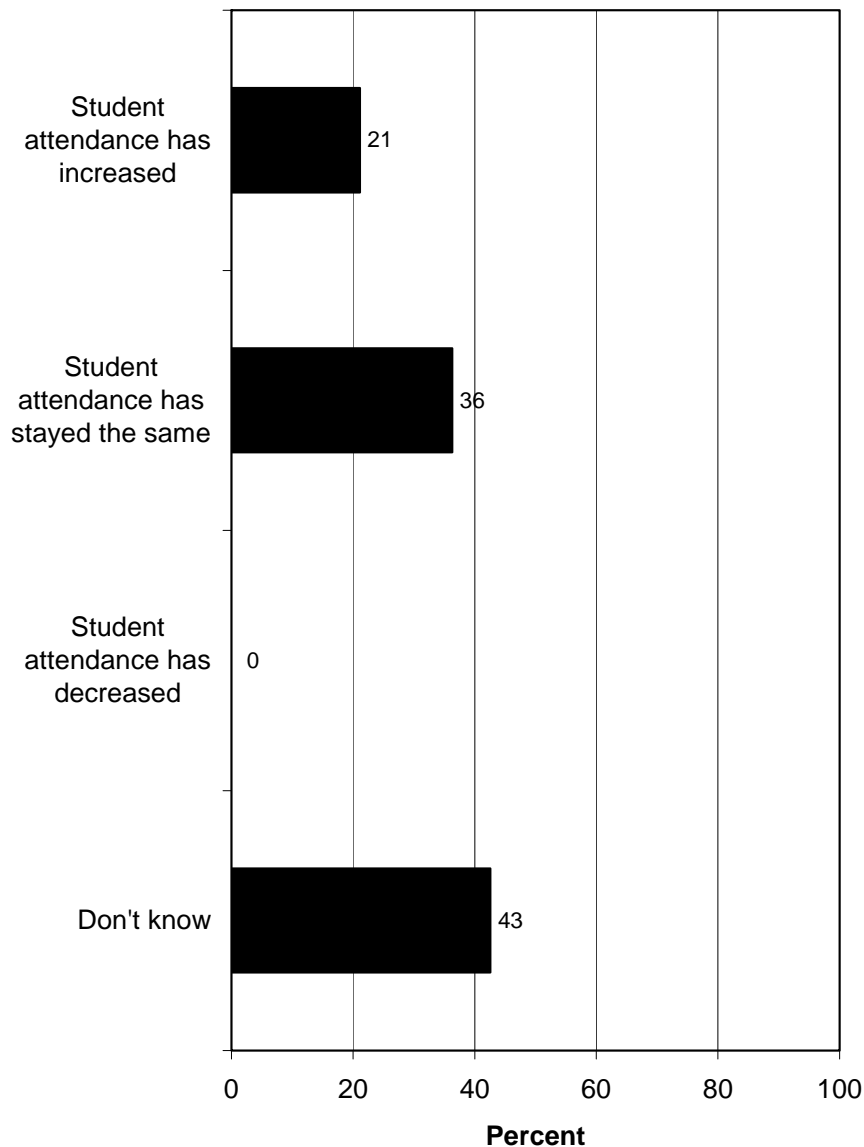
**Q21. How has the NASP affected student attendance in PE class?**



**Figure 43. Effect of the NASP on attendance in PE class.**

When asked how the NASP has affected student attendance in school, instructors most commonly say they do not know (43%). Otherwise, 36% say that student attendance in school has stayed the same, while 21% say that student attendance has increased. The average response was 2.37 on a scale of 1 to 3.

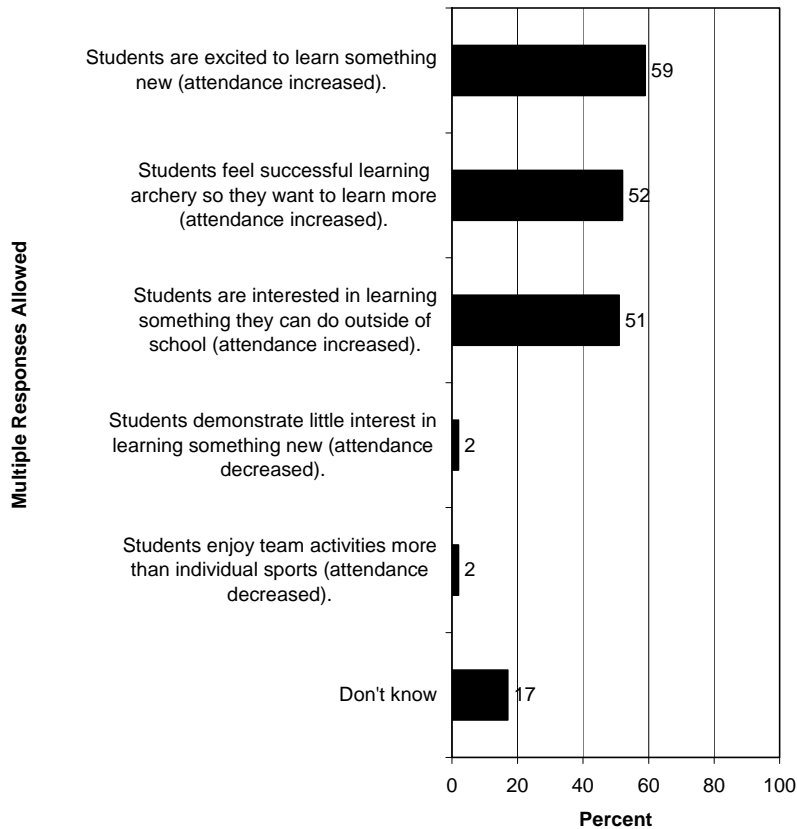
**Q20. How has the NASP affected student attendance in school?**



**Figure 44. Effect of the NASP on attendance in school.**

Instructors were asked how they thought the NASP specifically affects student attendance, and the most common responses regarding the ability of the NASP to increase attendance were that students are excited to learn something new (59%), that students feel successful learning archery so they want to learn more (52%), and that students are interested in learning something that they can do outside of school (51%). Teachers who have been involved with the NASP program for 3 or more years were more likely to believe that the program affects student attendance in the following ways: students are excited to learn something new; students are interested in learning something they can do outside of school; and students feel successful learning archery so they want to learn more. Among instructors who teach the course for 4 weeks or more, they are more likely to believe that the program affects student attendance because students feel successful learning archery so they want to learn more. Teachers who are involved with NASP where an after-school team or club is present are more likely to say that the program affects student attendance in the following ways: students are interested in learning something they can do outside of school, and students feel successful learning archery so they want to learn more.

**Q22. What, specifically, about the program do you think affects student attendance?**



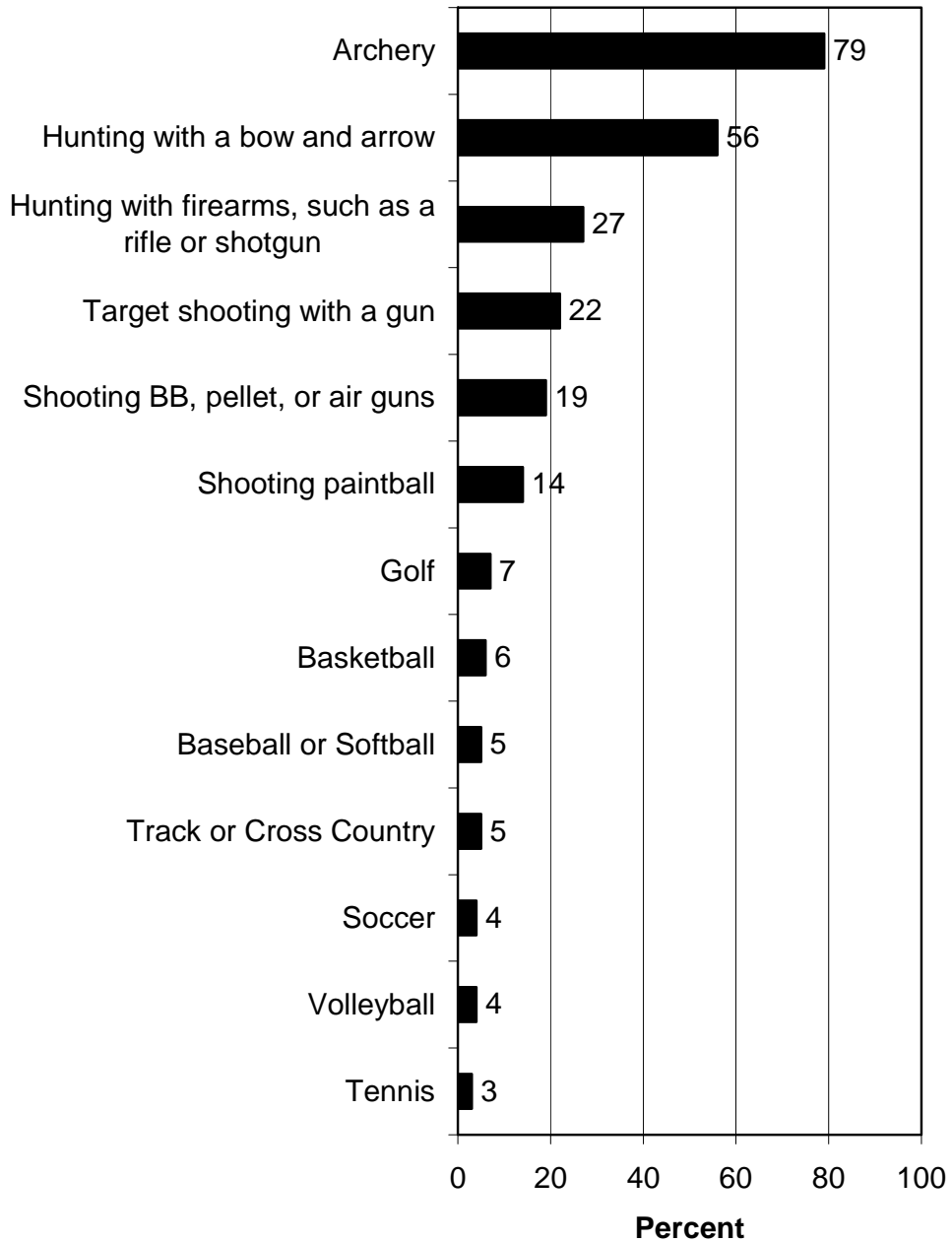
**Figure 45. How the NASP affects student attendance.**

### *Increase Student Interest/Involvement in Archery and Other Sports*

Instructors were asked about the sports in which student interest may have increased, remained the same, or decreased following their participation in the NASP.

Unsurprisingly, archery was by far the most commonly named sport, with 79% of instructors saying that student interest had increased in archery. Most of the other sports in which instructors say that student interest has increased concern hunting or shooting: 56% of instructors say that student interest in hunting with a bow and arrow has increased, while more than a quarter of instructors (27%) say that interest has increased in hunting with firearms, such as a rifle or shotgun; other sports in which student interest has increased include target shooting with a gun (22%); shooting BB, pellet, or air guns (19%); or shooting paintball (14%). Substantial percentages of instructors say student interest has remained the same in baseball/softball (50%), basketball (49%), volleyball (49%), soccer (46%), track/cross country (42%), tennis (40%), and golf (38%).

**Q35. Percent of sports in which students' interest increased following the archery course.**



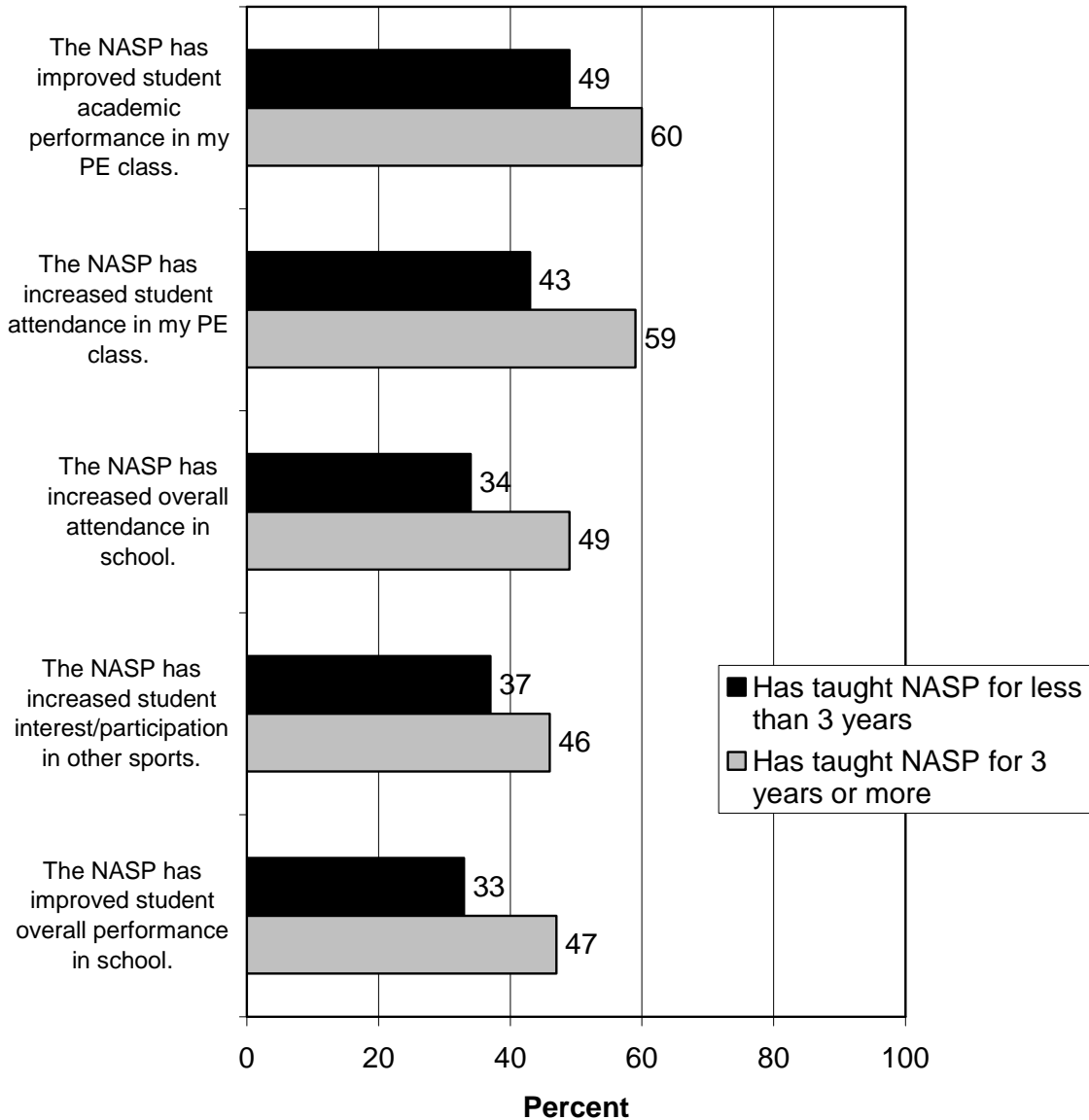
**Figure 46. Effect of the NASP on student interest in archery and other sports.**

The same three factors of implementation for the effects of student learning skills and attitudes were found to increase the effect of the NASP on attendance, performance, and interest in other sports: 1) taking part in the NASP for more than 3 years; 2) teaching archery for 4 weeks or more; and 3) the presence of an after-school club. Taken together, the following conditions of implementation had a significant positive effect on student attendance, performance, and interest in archery: 1) taking part in the NASP for more than 3 years and teaching archery for 4 weeks or more; 2) taking part in the NASP for more than 3 years and the presence of an after-school club; 3) teaching archery for 4 weeks or more and the presence of an after-school club; 4) taking part in the NASP for more than 3 years, teaching archery for 4 weeks or more, and the presence of an after-school club. However, there do not appear to be significant differences among the conditions of implementation and the program's impact on student interest and participation in other sports.

**Table 17. Ratings of the Effect on Attendance, Performance, and Interest in Sports by Years of Instructor Experience Teaching the NASP**

<b>Improvements/increases in:</b>	<b>&lt; 3 yrs</b>	<b>&gt; 3 yrs</b>	<b>Significance</b>
Performance in PE class	49%	60%	<.01
Attendance in PE class	43%	59%	<.01
Overall attendance	34%	49%	<.05
Interest in other sports	37%	46%	$p = .080$
Overall academic performance	33%	47%	<.05

**Q15. Percent of instructors who moderately or strongly agree with the following statements, based on their experiences teaching the program.**

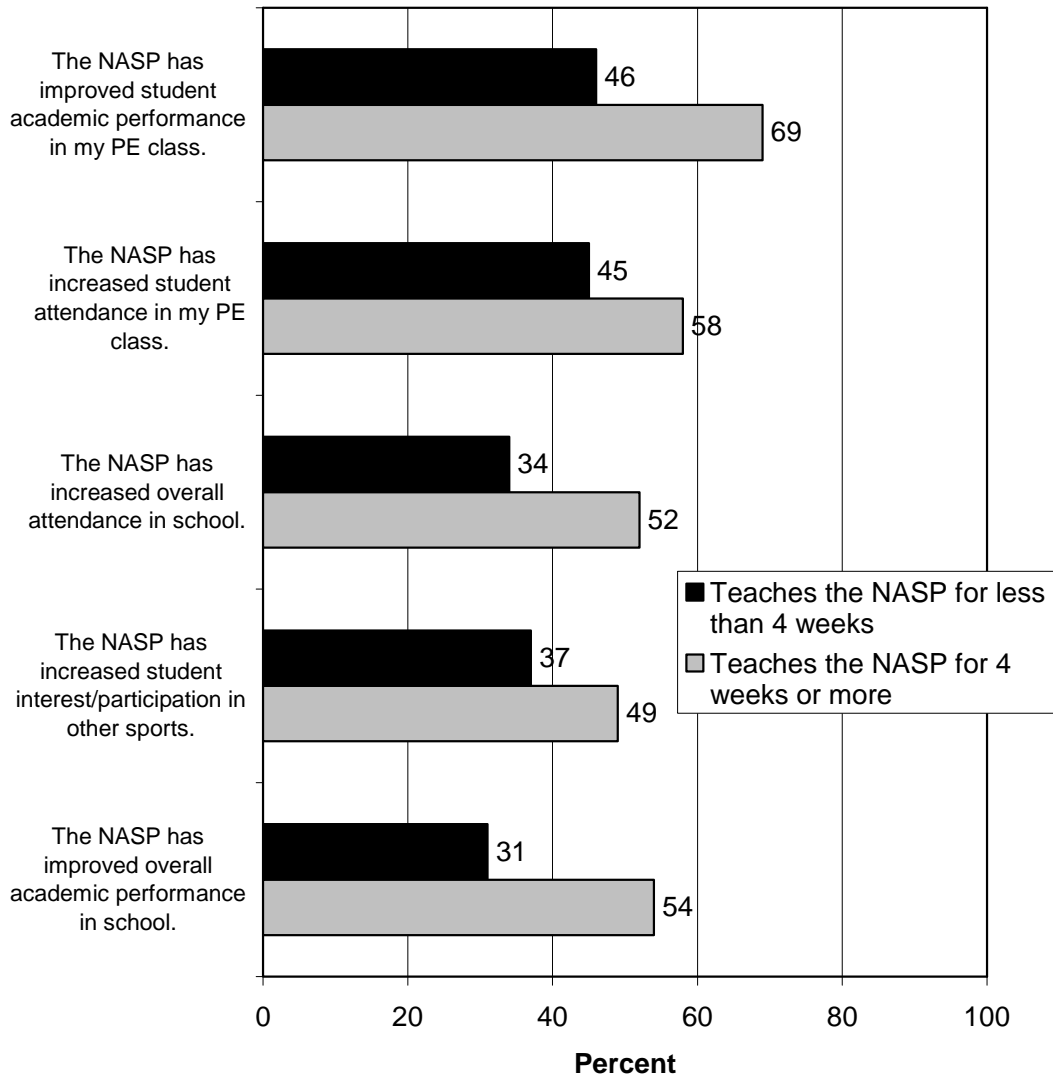


**Figure 47. Ratings of the effect on attendance, performance, and interest in sports by years of instructor experience teaching the NASP.**

**Table 18. Ratings of the Effect on Attendance, Performance, and Interest in Sports by Length of NASP Unit**

<b>Improvements/increases in:</b>	<b>&lt; 4 wks</b>	<b>&gt; 4 wks</b>	<b>Significance</b>
Performance in PE class	46%	69%	< .001
Attendance in PE class	45%	58%	< .01
Overall attendance	34%	52%	< .01
Interest in other sports	37%	49%	$p = .069$
Overall academic performance	31%	54%	< .001

**Q15. Percent of instructors who moderately or strongly agree with the following statements, based on their experiences teaching the program.**

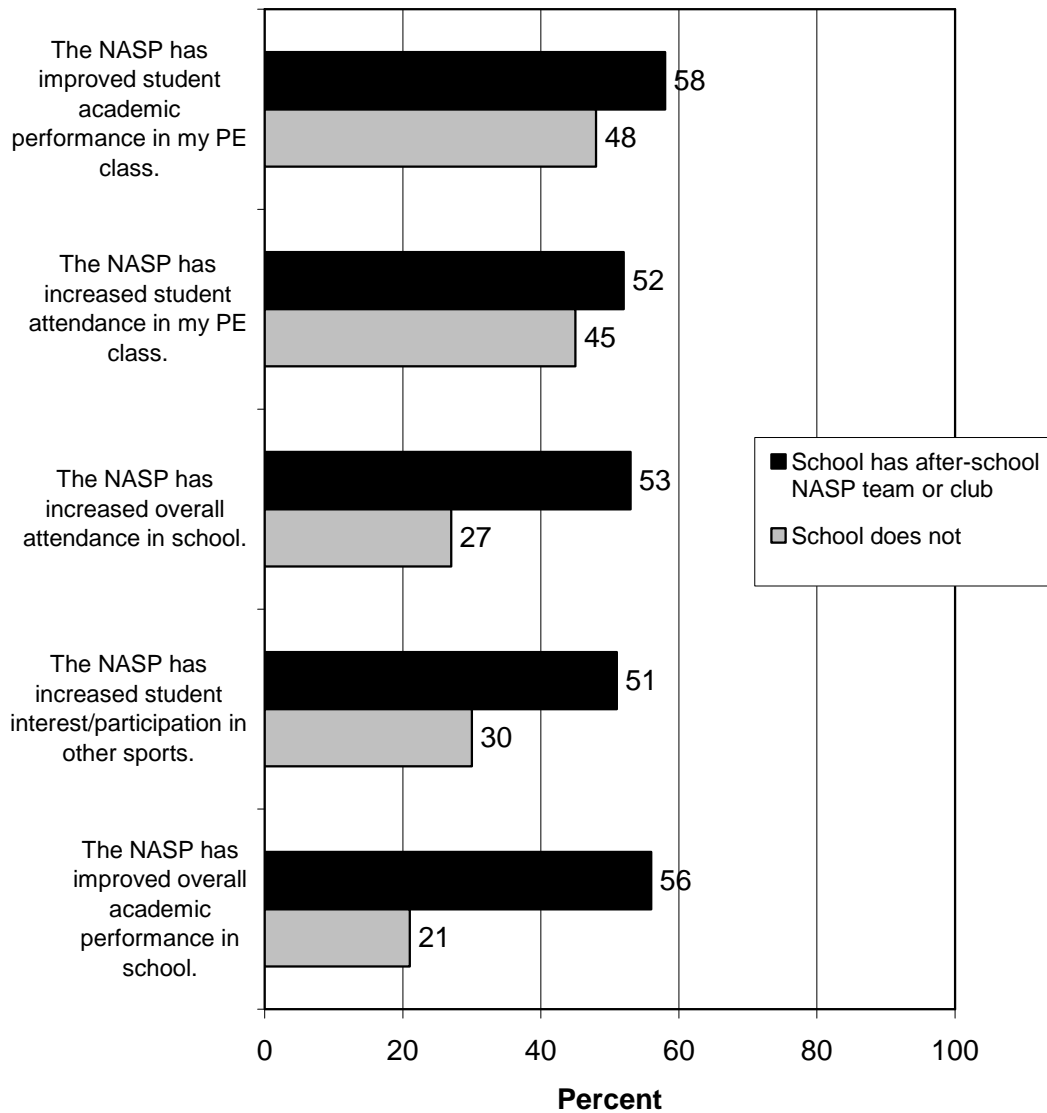


**Figure 48. Ratings of the effect on attendance, performance, and interest in sports by length of NASP unit.**

**Table 19. Ratings of the Effect on Attendance, Performance, and Interest in Sports by Presence or Absence of an After-School Club**

<b>Improvements/increases in:</b>	<b>No club</b>	<b>Club</b>	<b>Significance</b>
Performance in PE class	48%	58%	< .001
Attendance in PE class	45%	52%	< .05
Overall attendance	27%	53%	< .001
Interest in other sports	30%	51%	<.001
Overall academic performance	21%	56%	< .001

**Q15. Percent of instructors who moderately or strongly agree with the following statements, based on their experiences teaching the program.**



**Figure 49. Ratings of the effect on attendance, performance, and interest in sports by presence or absence of an after-school club.**

**Table 20. Significance Level for Combined Factors of Instructor Experience, Length of Archery Training for Students, and After-School Club Offerings on Perceived Positive Effects on Outcomes for Students**

Improvements/increases in:	> 3 years and > 4 wks	> 3 years and club	>4 weeks and club	> 3 years, >4 weeks, and club
Performance in PE class	<.01	<.01	<.01	$p = .062$
Attendance in PE class	<.05	<.05	<.001	<.05
Overall attendance	<.05	<.001	<.01	<.05
Interest in other sports	$p = .082$	$p = .065$	<.05	$p = .106$
Overall academic performance	<.01	<.001	<.001	<.01

**Conclusions About Hypothesis 3: The NASP Affects Student Attendance, Performance in School, and Interest in Archery and Other Sports**

***The NASP Has Improved Student Academic Performance in More Than Half of the PE Classes With More Intense Archery Programs or Experienced Instructors.*** When asked specifically if the NASP has affected student performance in their PE classes, 43% of instructors report that archery has improved student performance. Twenty-three percent (23%) say performance has stayed about the same, and 34% say they do not know. When asked if they agree with a series of statements, 53% of instructors strongly or moderately agree that the NASP has affected student performance in their PE classes. When the data are disaggregated, the percentage of instructors who strongly or moderately agree that the NASP has improved student academic performance in their PE classes increases to 60% for those with more than 3 years of teaching the NASP, 69% for those who teach it for more than 4 weeks a year, and 58% for those who have after-school clubs. Seventy-one percent (71%) of instructors attribute the improvement in performance to students becoming confident that they can learn, that they learn to follow directions (66%), that they learn how to focus (61%), and that they improve their learning skills.

***The NASP Has Increased Attendance in Half of the PE Classes With More Intense Archery Programs or Experienced Instructors.*** As a group, 31% percent of instructors say that attendance in their PE class is better due to the NASP. When asked if they agree with a series of statements, 49% of instructors strongly or moderately agree that the NASP has increased student attendance in their PE classes. When the data are disaggregated, 50% or more for those teaching the NASP 3 or more years (59%), for those who teach more than 4 week long archery classes (58%), and for those who have school clubs (52%) strongly or moderately agree that the NASP has increased attendance in their PE classes. When asked why the NASP affects attendance, 59% say that students are excited to learn something new, 52% say that students feel successful learning archery so they want to learn more, and 51% say that students are interested in learning something they can do outside of school.

***The NASP Has Increased Attendance in Half the Schools With More Intense Archery Programs or Experienced Instructors.*** Twenty-one percent (21%) of instructors report that the NASP has affected attendance in school. Forty-three percent (43%) say they don't know, and 36% say attendance has stayed the same. When asked if they agree with a series of statements, 40% of instructors strongly or moderately agree that the NASP has increased overall student attendance in their school. When data are disaggregated by the same three implementation factors, the percentages go up to 49% for 3 or more years of experience, 52% for more than 4 weeks of use, and 53% for schools with after-school clubs.

***The NASP Has Increased Overall Student Academic Performance in Half the Schools With More Intense Archery Programs or Experienced Instructors.*** Twenty-four percent (24%) say that an effect of NASP is that overall student academic performance has improved. Twenty-seven percent (27%) say it has remained the same, and 48% report that they do not know. When asked if they agree with a series of statements, 38% of instructors strongly or moderately agree that the NASP has improved overall academic performance in their school. Forty-seven percent (47%) of instructors with 3 or more years of experience say that overall academic performance has improved as a result of the NASP. Fifty-four (54%) of the 4-week-or-more group agrees, and 56% of the after-school club group agrees.

***The NASP Has Increased Student Interest in Archery in Most Schools.*** Seventy-nine percent (79%) of instructors say that the NASP increases student interest in archery.

***The NASP Has Increased Student Interest in Hunting and Shooting Sports in Many Schools.*** Instructors say that students are more interested in hunting with a bow and arrow (56%), hunting with firearms such as a rifle or shotgun (27%); target shooting with a gun (22%); shooting BB, pellet, or air guns (19%); or shooting paintball (14%).

***Summary of the Effect of the NASP on Attendance, Performance, and Interest in Archery and Other Sports***

In these data on outcomes, there is evidence that implementing the NASP affects student attendance and performance in PE and overall academically, if the instructors are more experienced, they teach archery for 4 weeks or longer, or they have an after-school club. When any one of these characteristics is present, at least 50% of instructors report a positive effect on outcomes. Offering the NASP definitely increases student interest in archery and in some related hunting and shooting sports.

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*“Some of the students hunt in this area, and they get excited about learning and being taught something that really interests them.”*

~ Kentucky Instructor

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## V. CONCLUSIONS AND RECOMMENDATIONS

This phase of the study on the NASP has collected data on instructors' perceptions of the program and its effects. It was hypothesized that the program would result in outcomes of better attendance as well as in performance and interest in sports. The intermediary variables or outputs were hypothesized to be learning skills and attitudes, student engagement, and instructor satisfaction. The data show that the vast majority of instructors are satisfied with the NASP curriculum and their own training and that they feel competent in teaching it. Their students look forward to coming to class during archery, are able to learn how to do it, and get to be good at it. These results are strong and consistent for the entire group of 408 instructors who were surveyed.

When the data about the effects on learning skills and attitudes and the outcomes are analyzed, the results are positive for the schools where instructors have more experience, teach archery for more than 4 weeks a year, or have an after-school club. About half of these schools, with more intense or experienced implementation, report that the NASP affects learning skills and attitudes, as well as attendance and performance in class and interest in hunting or shooting sports. As expected, three quarters of instructors say that the NASP increases their students' interest in archery.

The student questionnaire data will support additional examination of the extent and conditions under which archery affects student learning skills and attitudes, attendance, performance, and interests. These results suggest that as instructors gain experience they will also see greater effects and find ways to intensify the implementation in their schools.

This phase of the study confirms the first hypothesis, that the NASP engages students and prepares and supports teachers to engage them. The second hypothesis, that students improve their learning skills and attitudes through archery, is confirmed for schools with instructors with more than 3 years of experience, who teach archery more than 4 weeks a year, or have an after-school club. The third hypothesis, that the NASP improves attendance and performance in PE and in school, is confirmed for schools with instructors with more than 3 years of experience, who teach archery more than 4 weeks a year, or have an after-school club. It also confirms that the NASP increases student interest in archery and other hunting and shooting sports.

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*"In the elementary setting, I think it is a fantastic program. I resisted it for 2 years because I didn't know anything about archery. The training prepared me for it, and I was able to teach it. Now that I've done it for 3 years, this is the best program that I run."*

~Minnesota Instructor

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## APPENDIX A: INSTRUCTOR SURVEY

### NATIONAL ARCHERY IN THE SCHOOLS PROGRAM (NASP) ASSESSMENT TEACHER SURVEY

Please provide the following contact information. Information will be kept strictly confidential and will only be used for the purposes of this study; all responses are guaranteed confidentiality and anonymity. Thank you for your willingness and cooperation in completing a survey; we appreciate your assistance on this project.

Name: \_\_\_\_\_

Phone: \_\_\_\_\_

Email: \_\_\_\_\_

#### PROGRAM INFORMATION:

The following questions seek information about National Archery in the Schools Program (NASP) implementation within your current school.

1. How long have you been teaching archery in your current school? (Check only one answer)
  - Over 3 years
  - 3 years
  - 2 years
  - 1 year
  - 6 months
  - This is my first time teaching archery.
  - Other: \_\_\_\_\_
  
2. How long have you been involved in the NASP in your current school? (Check only one answer)
  - Over 3 years
  - 3 years
  - 2 years
  - 1 year
  - 6 months
  - This is my first time teaching the program.
  - Other: \_\_\_\_\_
  
3. Is the NASP a **required** course as a part of the PE curriculum at your school? (Check all that apply)
  - It is a **required** course for every student participating in the PE curriculum at our school
  - It is a **required** course for certain grade levels at our school
  - It is an elective course for students who choose to take PE

- It is offered as an elective after school club or team
- Other: \_\_\_\_\_

4. How long is the NASP taught in your PE curriculum? (Check only one answer)

- Over 1 semester
- 1 semester
- 6 weeks
- 4-5 weeks
- 3-4 weeks
- 2-3 weeks
- Under 2 weeks
- Other: \_\_\_\_\_

5. Approximately how many students are enrolled in the NASP archery course at one time? (If multiple teachers are involved in teaching the NASP, indicate the approximate number of students per teacher; check only one answer)

- 5 or less
- 6-10
- 11-15
- 16-20
- 21-25
- 26-30
- 31-35
- 36-40
- 41-45
- 46-50
- 51 or more

6. Approximately how many students participated in the NASP during the past 3 years? \_\_\_\_\_

7. During what season do you offer the NASP archery course in your school?

(Check all that apply)

- Fall
- Winter
- Spring
- Summer
- Other: \_\_\_\_\_

8. How many years has your school participated in the NASP? (If you don't know, please enter a question mark "?" in the space provided.) \_\_\_\_\_

9. In which grade levels do you teach the NASP archery course in your school?

(Check all that apply)

- |                                       |                                       |
|---------------------------------------|---------------------------------------|
| <input type="checkbox"/> Third Grade  | <input type="checkbox"/> Eighth Grade |
| <input type="checkbox"/> Fourth Grade | <input type="checkbox"/> Ninth Grade  |
| <input type="checkbox"/> Fifth Grade  | <input type="checkbox"/> Tenth Grade  |

- Sixth Grade
- Seventh Grade

- Eleventh Grade
- Twelfth Grade

10. Does your school have an after school NASP archery team or club? (Check only one answer)

- Yes (If you answered “yes,” go to Question #10)
- No (If you answered “no,” go to Question #11)
- Don't know

11. Approximately how many students belong to the NASP archery team or club each year? \_\_\_\_\_

12. Please explain why your school **does not** offer an NASP archery team or club.

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**PROGRAM REACTION:**

The following questions explore your overall satisfaction with the National Archery in the Schools Program (NASP).

13. How would you rate your overall satisfaction with the NASP? (Check only one answer)

- Very satisfied
- Somewhat satisfied
- Neither satisfied or dissatisfied
- Somewhat dissatisfied
- Very dissatisfied
- Don't know

14. How effective is the NASP? (Check only one answer)

- Very effective
- Somewhat effective
- Not at all effective
- Don't know

15. Based on your experience teaching the program, please indicate if you agree or disagree with the following statements about the NASP, in general, in your school (Please give us your overall opinion; these statements may not apply to every student):

<b>The NASP has:</b>	<b>Strongly agree</b>	<b>Moderately agree</b>	<b>Neither agree nor disagree</b>	<b>Moderately disagree</b>	<b>Strongly disagree</b>	<b>Don't know</b>
Increased student attendance in school.						
Increased student attendance in my PE class.						
Improved student academic performance in school.						
Improved student academic performance in my PE class.						
Improved student concentration and focus.						
Improved student self-confidence.						
Improved student motivation.						
Improved student behavior.						
Improved student attitudes.						
Increased student interest/ participation in other sports.						
Improved working with/learning from the PE or archery teacher.						

16. How difficult was the NASP archery course for your students as a whole? (Check only one answer)

- Very difficult
- Somewhat difficult
- Not at all difficult
- Don't know

17. Do you agree or disagree that your NASP training adequately prepared you to teach the NASP course? (Check only one answer)

- Strongly agree
- Moderately agree
- Neither agree nor disagree
- Moderately disagree
- Strongly disagree
- Don't know

18. On a scale of 0-10, with 0 being incompetent and 10 being extremely competent, please rate your competency in teaching the NASP archery course?

\_\_\_\_\_

**PROGRAM EFFECTS:**

The following questions ask about the National Archery in the School's affect on your students' attendance, achievement, self-confidence, motivation, and behavior.

## Attendance, Achievement, and Behavior

19. Did students appear to look forward to going to **school** more, about the same, or less on the days they attended the NASP archery course? (Check only one answer)
- More
  - Same
  - Less
  - Don't know
20. How has the NASP affected student **attendance in school**? (Check only one answer)
- Student attendance has increased
  - Student attendance has stayed the same
  - Student attendance has decreased
  - Don't know
21. How has the NASP affected student **attendance in PE class**? (Check only one answer)
- Student attendance has increased
  - Student attendance has stayed the same
  - Student attendance has decreased
  - Don't know
22. What, specifically, about the program do you think affects student **attendance**? (check all that apply)
- Students are excited to learn something new (attendance increased).
  - Students are interested in learning something they can do outside of school (attendance increased).
  - Students feel successful learning archery so they want to learn more (attendance increased).
  - Students demonstrate little interest in learning something new (attendance decreased).
  - Students feel intimidated about learning (attendance decreased).
  - Students enjoy team activities more than individual sports (attendance decreased).
  - Don't know
  - Other (please describe)
- 
- 
- 
23. How has the NASP affected overall student academic **performance in school**? (Check only one answer)
- Student performance has improved
  - Student performance has stayed the same

- Student performance has worsened
- Don't know

24. How has archery affected student academic **performance in PE class**? (Check only one answer)

- Student performance has improved
- Student performance has stayed the same
- Student performance has worsened
- Don't know

25. What, specifically, about the program do you think affects student **performance**? (check all that apply)

- Students improve learning skills (performance improved).
  - Students become confident that they can learn new skills (performance improved).
  - Students learn how to focus (performance improved).
  - Students learn to follow directions (performance improved).
  - Students feel intimidated about learning new skills (performance worsened).
  - Students have a difficult time focusing (performance worsened).
  - Students have a hard time following directions (performance worsened).
  - Don't know
  - Other (please describe)
- 
- 

26. How has archery affected student **behavior** as a whole? (Check only one answer)

- Student behavior has improved
- Student behavior has stayed the same
- Student behavior has worsened
- Don't know

27. What, specifically, about the program do you think affects student **behavior**? (Check all that apply)

- Students have fewer discipline problems (behavior improved).
  - Students demonstrate better interpersonal relationships among other students (behavior improved).
  - Students exhibit more on-task behaviors (behavior improved).
  - Students ask more questions, demonstrating confidence and interest in subjects (behavior improved).
  - Students have more discipline problems (behavior worsened).
  - Students are less focused (behavior worsened).
  - Don't know
  - Other (please describe)
- 
-

28. Do you think students pay more, about the same, or less attention to what they are doing in the NASP archery course than in other classes? (Check only one answer)

- More
- Same
- Less
- Don't know

29. Please explain your answer.

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30. Do you agree or disagree that student concentration is improved by taking archery? (Check only one answer)

- Strongly agree
- Moderately agree
- Neither agree nor disagree
- Moderately disagree
- Strongly disagree
- Don't know

31. Please explain your answer.

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32. Overall, how would you rate the archery skills of your students as a whole? (Check only one answer)

- Very good
- Good
- Not very good
- Don't know

### Self-Confidence

33. In general, did the NASP give students more, about the same, or less self-confidence in the following areas?

Area	More	About the same	Less	Don't know
Self-confidence about school work				
Self-confidence about other sports and physical activities				
Self-confidence about friendships with other students				
Self-confidence about relationships with teachers				

### Motivation

34. In general, did the NASP give students more, about the same, or less motivation in the following areas?

Area	More	About the same	Less	Don't know
Motivation to attend school				
Motivation to get good grades				
Motivation to stay out of trouble				
Motivation to participate in other sports and activities				
Motivation to be respectful of adults and friends				

### Interest in Sports

35. **After** teaching the archery course, have you noticed an increase or decrease in students' interest in the following sports?

Activity	Increase	Remained the same	Decrease	Don't know
Archery				
Golf				
Soccer				
Basketball				
Volleyball				
Baseball or Softball				
Tennis				

Track or Cross Country				
Target shooting with a gun				
Hunting with a bow and arrow				
Hunting with firearms, such as a rifle or shotgun				
Shooting BB, pellet, or air guns				
Shooting paintball				

36. Based on your overall impression of the program and its affect on your students, please identify the strengths of the NASP.

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37. Based on your overall impression of the program and its affect on your students, please offer any recommendations you have for improving the NASP.

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**DEMOGRAPHICS**

38. Do you consider your place of residence to be in a big city or urban area, suburban area, a small city or town, or a rural area? (Check only one answer)

- Big city or urban area
- Suburb of large metro area
- Small city or town
- Rural area
- Don't know

39. Please indicate all races or ethnic backgrounds that you consider yourself. (Check all that apply)

- White or Caucasian
- Black or African-American
- Hispanic or Latino
- Native American or Alaskan native or Aleutian
- Native Hawaiian
- Middle Eastern
- East Asian
- South Asian
- African
- Other
- Don't know

40. How old are you?

- |                                   |                                      |
|-----------------------------------|--------------------------------------|
| <input type="checkbox"/> Under 20 | <input type="checkbox"/> 35-39       |
| <input type="checkbox"/> 20-24    | <input type="checkbox"/> 40-44       |
| <input type="checkbox"/> 25-29    | <input type="checkbox"/> 45-49       |
| <input type="checkbox"/> 30-34    | <input type="checkbox"/> 50 or older |

41. What is your gender?

- Male
- Female

42. What is the name of your school? \_\_\_\_\_

43. In which county is your school located? \_\_\_\_\_

44. In which state is your school located? \_\_\_\_\_

45. What grade level(s) do you teach? (Check all that apply)

- |   |   |
|---|---|
| <input type="checkbox"/> Pre-Kindergarten | <input type="checkbox"/> Sixth Grade    |
| <input type="checkbox"/> Kindergarten     | <input type="checkbox"/> Seventh Grade  |
| <input type="checkbox"/> First Grade      | <input type="checkbox"/> Eighth Grade   |
| <input type="checkbox"/> Second Grade     | <input type="checkbox"/> Ninth Grade    |
| <input type="checkbox"/> Third Grade      | <input type="checkbox"/> Tenth Grade    |
| <input type="checkbox"/> Fourth Grade     | <input type="checkbox"/> Eleventh Grade |
| <input type="checkbox"/> Fifth Grade      | <input type="checkbox"/> Twelfth Grade  |

## **ABOUT RESPONSIVE MANAGEMENT**

Responsive Management is an internationally recognized public opinion and attitude survey research firm specializing in natural resource and outdoor recreation issues. Its mission is to help natural resource and outdoor recreation agencies and organizations better understand and work with their constituents, customers, and the public.

Utilizing its in-house, full-service, computer-assisted telephone and mail survey center with 45 professional interviewers, Responsive Management has conducted more than 1,000 telephone surveys, mail surveys, personal interviews, and focus groups, as well as numerous marketing and communications plans, needs assessments, and program evaluations on natural resource and outdoor recreation issues.

Clients include most of the federal and state natural resource, outdoor recreation, and environmental agencies, and most of the top conservation organizations. Responsive Management also collects attitude and opinion data for many of the nation's top universities, including the University of Southern California, Virginia Tech, Colorado State University, Auburn, Texas Tech, the University of California—Davis, Michigan State University, the University of Florida, North Carolina State University, Penn State, West Virginia University, and others.

Among the wide range of work Responsive Management has completed during the past 20 years are studies on how the general population values natural resources and outdoor recreation, and their opinions on and attitudes toward an array of natural resource-related issues. Responsive Management has conducted dozens of studies of selected groups of outdoor recreationists, including anglers, boaters, hunters, wildlife watchers, birdwatchers, park visitors, historic site visitors, hikers, and campers, as well as selected groups within the general population, such as landowners, farmers, urban and rural residents, women, senior citizens, children, Hispanics, Asians, and African-Americans. Responsive Management has conducted studies on environmental education, endangered species, waterfowl, wetlands, water quality, and the reintroduction of numerous species such as wolves, grizzly bears, the California condor, and the Florida panther.

Responsive Management has conducted research on numerous natural resource ballot initiatives and referenda and helped agencies and organizations find alternative funding and increase their memberships and donations. Responsive Management has conducted major agency and organizational program needs assessments and helped develop more effective programs based upon a solid foundation of fact. Responsive Management has developed websites for natural resource organizations, conducted training workshops on the human dimensions of natural resources, and presented numerous studies each year in presentations and as keynote speakers at major natural resource, outdoor recreation, conservation, and environmental conferences and meetings.

Responsive Management has conducted research on public attitudes toward natural resources and outdoor recreation in almost every state in the United States, as well as in Canada, Australia, the United Kingdom, France, Germany, and Japan. Responsive Management routinely conducts surveys in Spanish and has also conducted surveys and focus groups in Chinese, Korean, Japanese, and Vietnamese.

Responsive Management's research has been featured in most of the nation's major media, including CNN's *Crossfire*, ESPN, *The Washington Post*, *The Washington Times*, *The New York Times*, *Newsweek*, *The Wall Street Journal*, and on the front page of *USA Today*.

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