



Delaware National Estuarine Research Reserve Education Needs Assessment Results

The Delaware National Estuarine Research Reserve conducted a needs assessment survey to help identify gaps in existing educational programs and to determine what types of changes need to be made to current K-12 and teacher professional development programs to better meet the needs of teachers and students within the State of Delaware. The survey targeted all formal elementary school, middle school, and high school teachers with an emphasis on the science teachers.

RESULTS:

A total of 216 responses were collected from 2,483 email invitations for a response rate of 9%. Of the teachers who responded, 85.4% teach in the public school system, 5.5% teach in charter schools, 3.2% teach in parochial schools, 2.7% teach in non-parochial private schools, 0.5% teach in after school programs, 0.5% teach in environmental education centers, and 2.2 % responded “other” (number of respondents were 216 with 219 responses).

More than half of all respondents teach at the elementary level (Fig. 1). Respondents were allowed to check all that applied so some may have checked more than one grade level (number of respondents were 216 with 243 question responses).

Figure 1: In what educational setting do you teach?

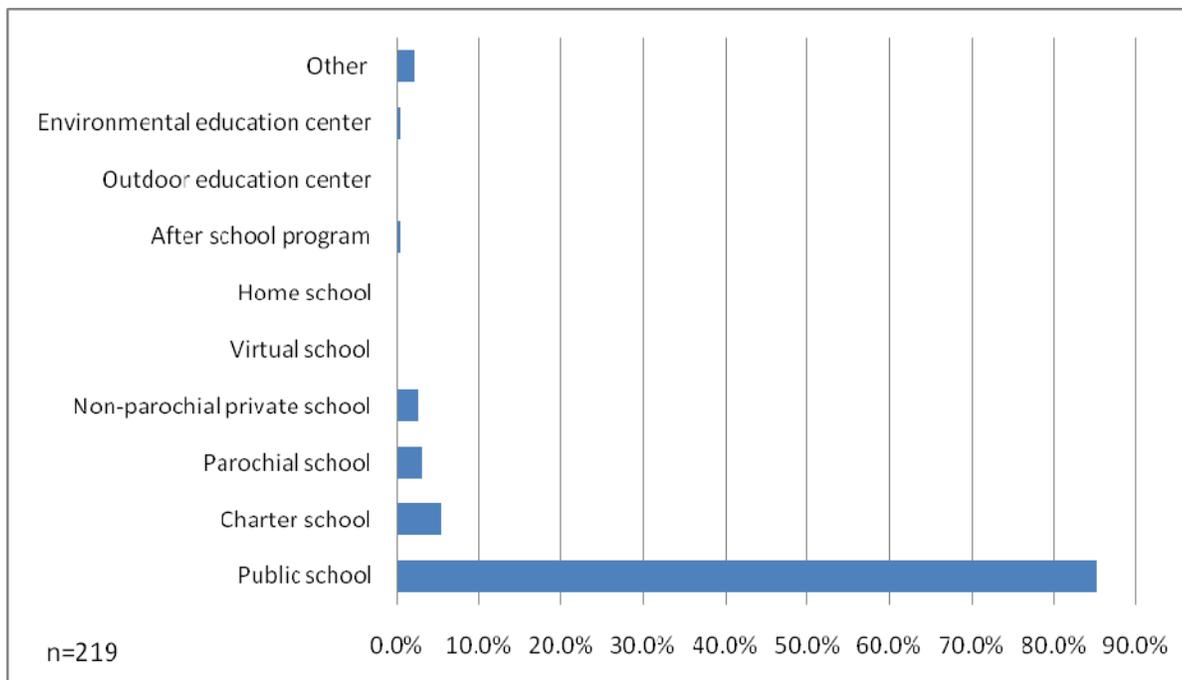
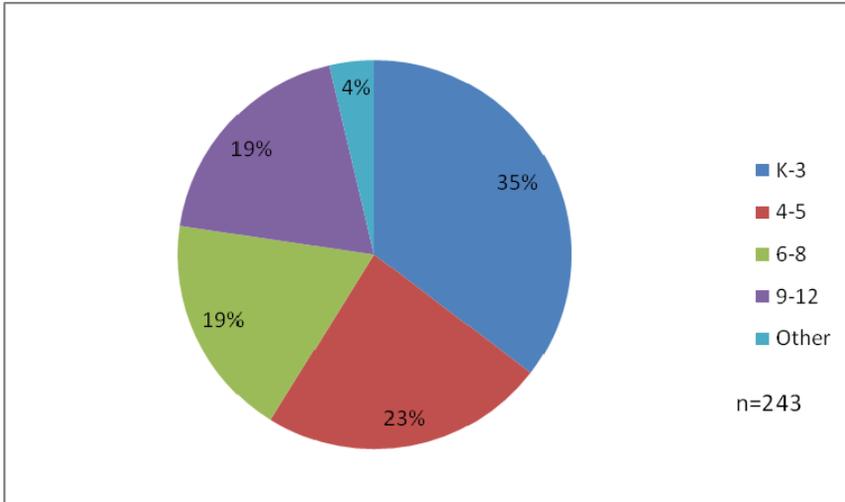
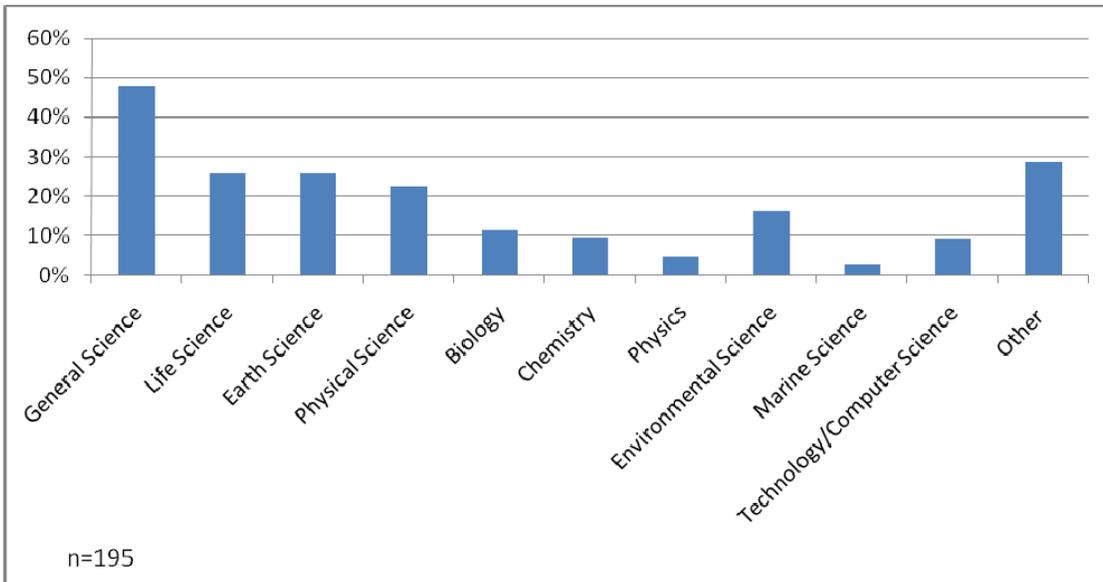


Figure 2: What grade level do you teach? (n=243; more than one response per person)



Of 195 respondents to the question regarding the science subject matter taught, 47.6% teach general science, 25.6% teach life science and earth science, 22.6% teach physical science, 16.4% teach environmental science, 11.3% teach biology, 9.7% teach chemistry, 9.2% teach technology/computer science (Fig. 3). Approximately 28% indicated that they taught other subjects in addition to sciences listed. Considering that the majority of respondents were elementary school teachers, it is not surprising that the more advanced science subjects, such as chemistry, biology, physics, and marine science are under-represented in this sample (Fig. 3).

Figure 3: Which of the following science subject matter do you teach?



Approximately 57.6% of the educators teach 1-3 different classes per year (Fig. 4). The length of the typical science class ranges from less than 20 minutes to more than 80 minutes. The majority of the respondents (75.1%) indicated that the length of a typical science class ranges between 20-60 minutes (Fig. 5). However, 87% of the respondents do not include longer class sessions for labs.

Figure 4: Number of classes taught per year

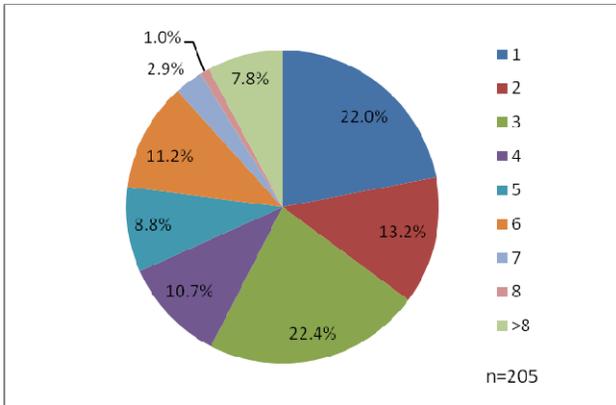
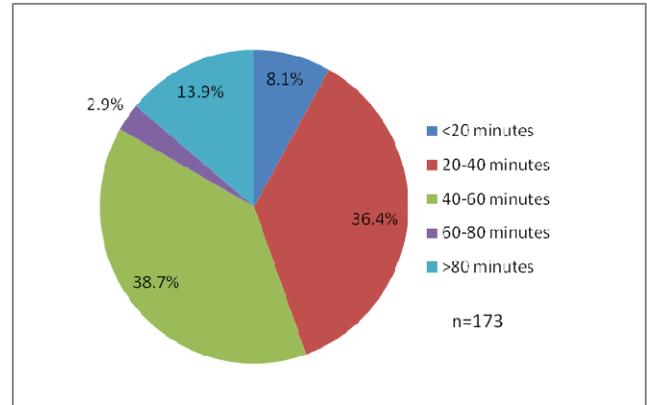


Figure 5: Length of science classes



Of the 185 respondents to the question regarding computer access, 92.4% stated that their students do have access to computers (Fig. 6). All but 2.7% of 188 respondents have computers connected to the internet, with the majority of the respondents having access to DSL, Cable, or T-1 line (Fig. 7).

Figure 6: Do you have access to computers for your students?

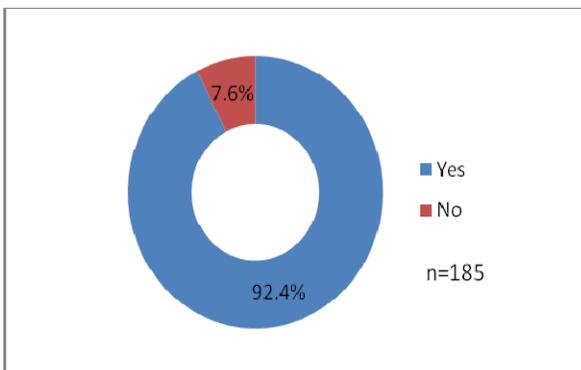
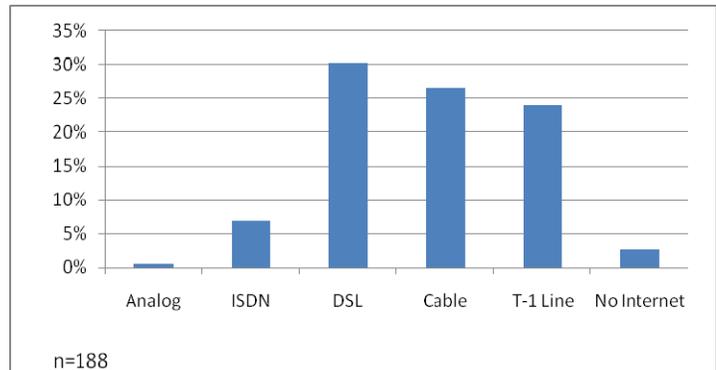


Figure 7: What type of internet connection do you have access to?



Respondent Demographics

Out of the 147 respondents who answered this question, 35% of teachers surveyed have been teaching for over 20 years, however, a wide range of experience exists in this sample (Fig. 8). The majority of teachers surveyed (66%) have a master's degree followed by 30% of respondents had a bachelor's degree (Fig. 9). Approximately 82% of the 145 respondents who answered the question have a degree in science or science education. Approximately 93% are certified to teach in Delaware.

Figure 8: How many years have you been teaching?

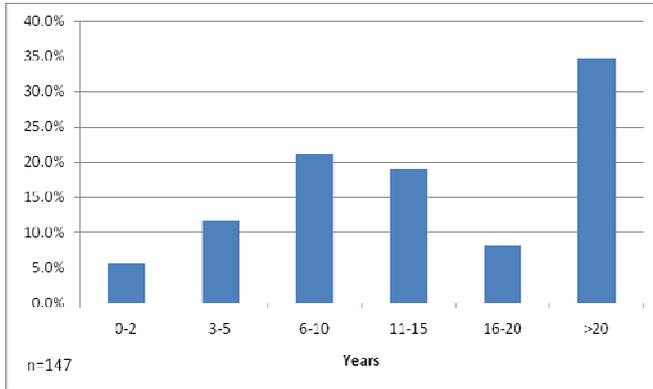
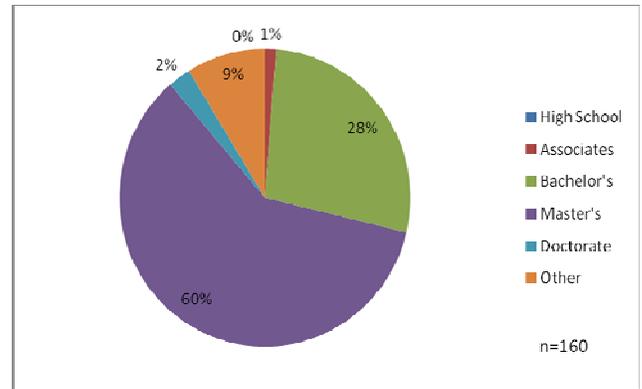


Figure 9: What is your highest academic degree?



Teaching Practices

The preferred modes of teaching for respondents are hands-on, inquiry-based activities and lecture/direct instruction (Fig. 10). The majority of the respondents teach at least one class period per year about estuaries, watersheds, or coastal areas; however 47.7% of the respondents do not teach any class periods on these subjects (Fig. 11). In addition, the majority of teachers responding stated that coastal and estuarine topics were required as part of the state teaching requirements (Table 1). It is interesting to note that when the respondents were asked about their knowledge of the existence of a National Estuarine Research Reserve in Delaware, approximately 65% were not aware that Delaware had a NERR.

Figure 10: Standard mode of teaching (1st choice)

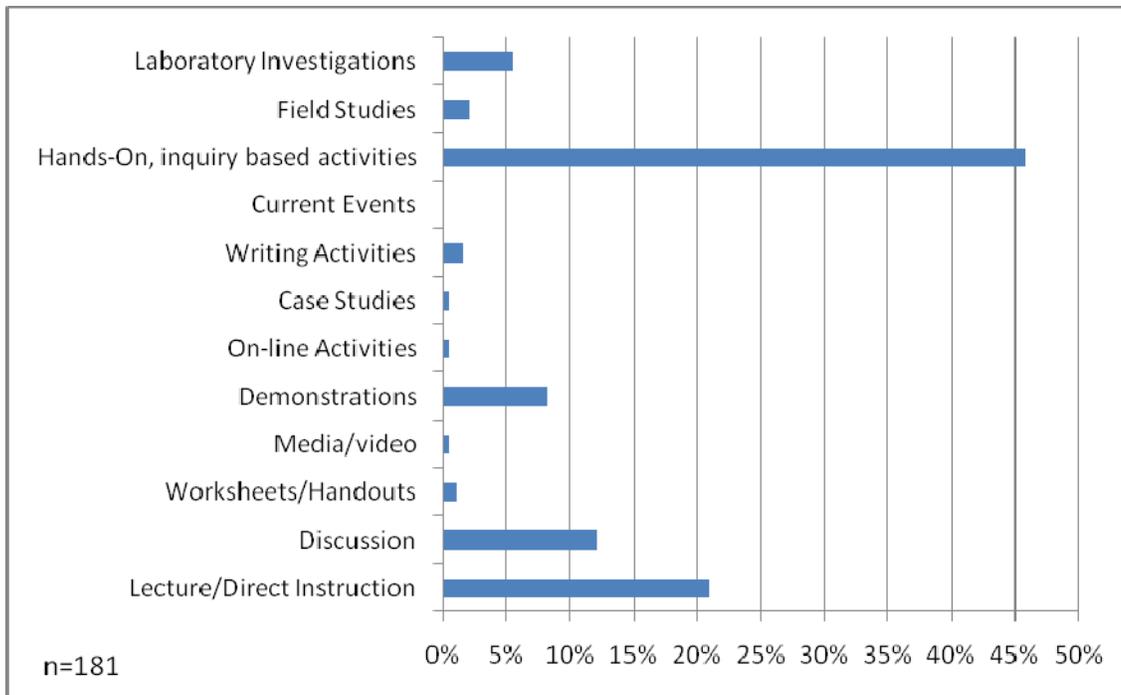


Figure 11: Number of classes per year teaching about estuaries, watersheds or coastal areas

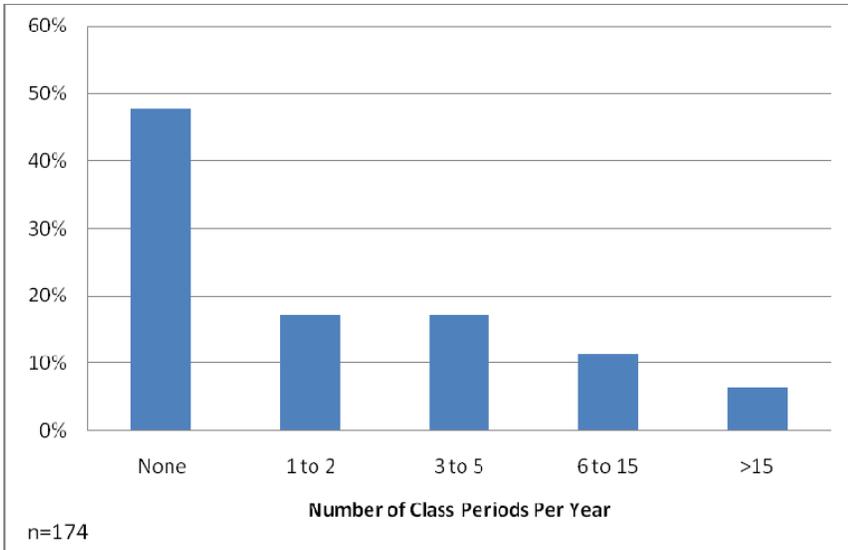


Table 1: Are coastal (areas of land next to the sea or bay), estuarine (areas where fresh water & salt water meet), or marine related topics a required part of your school's/district's/state's science teaching requirements?

Required By	Topic	Yes	No	Don't Know
School	Coastal	36.7%	35.0%	28.3%
	Estuarine	41.6%	32.7%	25.7%
	Marine	26.8%	43.8%	29.5%
District	Coastal	44.8%	22.9%	32.3%
	Estuarine	49.5%	22.0%	28.6%
	Marine	31.9%	33.0%	35.2%
State	Coastal	53.1%	17.3%	29.6%
	Estuarine	56.5%	15.2%	28.3%
	Marine	37.8%	24.4%	37.8%

Field Trips

The majority of teachers (65%) surveyed would be likely or very likely to bringing a group of students on an environmental education field trip (Fig. 12). The number of students teachers would bring on a field trip varied; however, approximately 45% of the respondents would bring more than 50 students (Fig. 13). Of those bringing more than 50 students, approximately 56% of them would be willing to bring the students over a 2-day period (Fig. 14).

Figure 12: Assuming an appropriate topic and activities of interest to your class/grade level were available, what would be the likelihood of you bringing a group of students on an environmental education field trip?

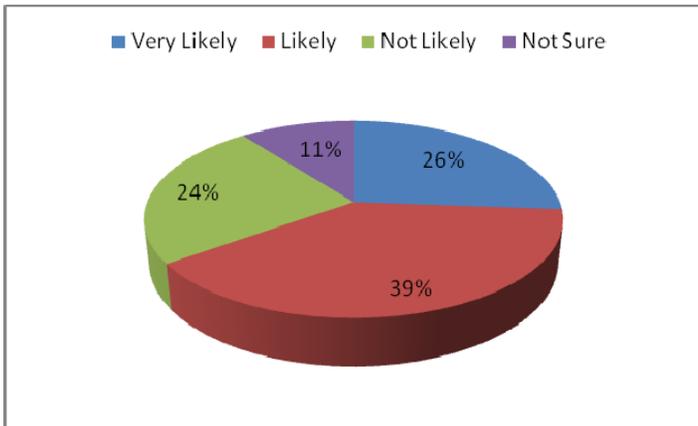


Figure 13: How many students would you be interested in bringing on a field trip?

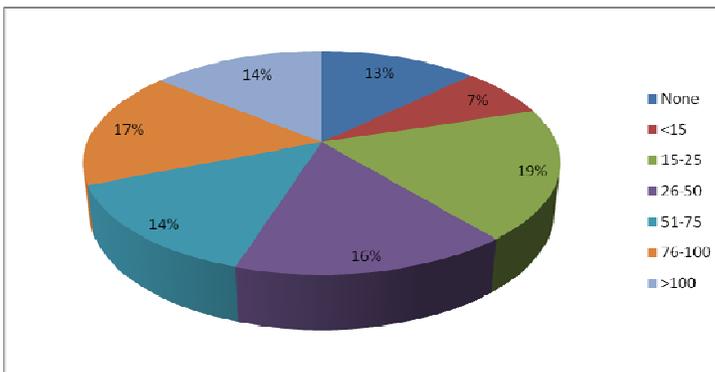
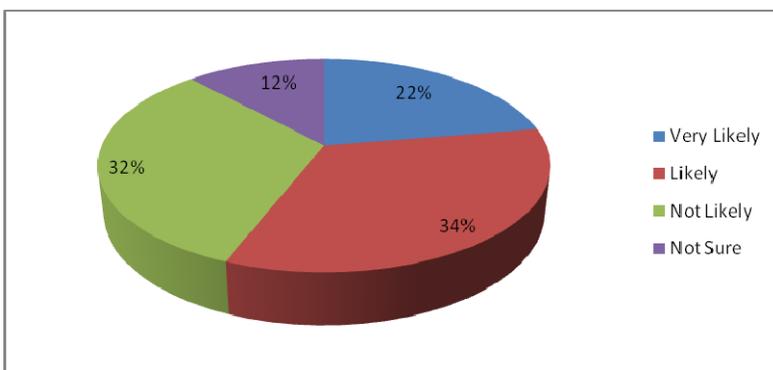


Figure 14: If you would want to bring more than 50 students on a field trip, what would be the likelihood of your ability to divide the group to bring smaller groups on 2 days?



The barriers for taking a class on a field trip are numerous; however, the most common answer was cost and transportation followed by relevance to the curriculum (Fig. 15). Teachers were also asked about their ability and comfort in taking students on an on-school grounds field trip. Approximately 55% of the teachers have an area outside they can utilize for teaching (Fig. 16) and 91% of the teachers would be either comfortable or very comfortable leading their students in an outdoor learning experience if they had the appropriate training (Fig. 17).

Figure 15: Which of the following do you see as significant impediments to your ability to bring a group of students on an environmental education field trip?

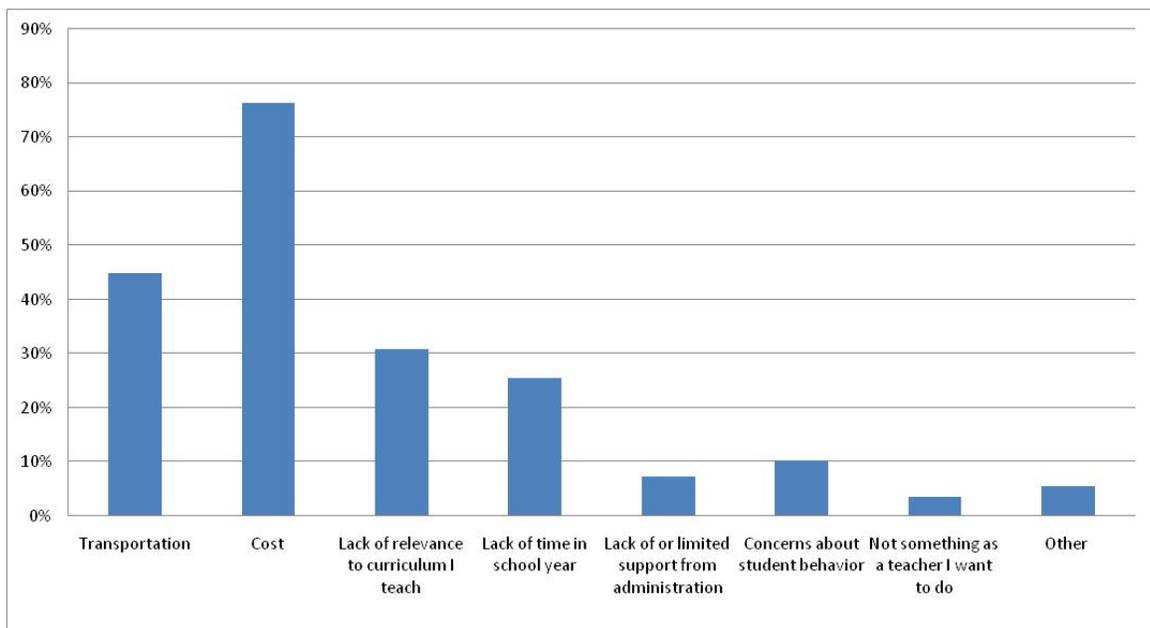


Figure 16: Do you have an area outside which you could use for teaching (for example: schoolyard habitat, wetland, stream, pond)?

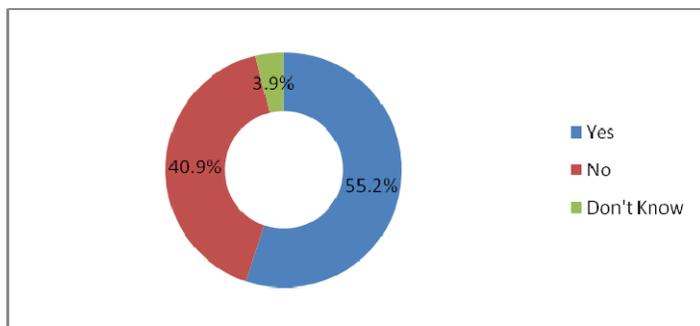
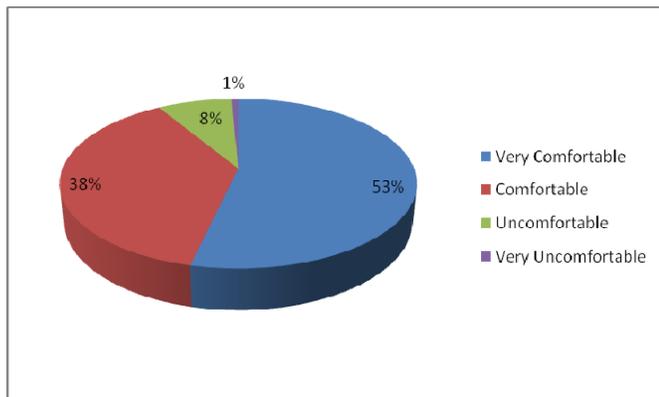


Figure 17: How comfortable would you be in leading your students in an outdoor learning experience if you were trained?



Educational Materials

Teachers expressed interest in a variety of topics on which they would like to be developed into educational materials. The most popular topic was the water cycle with a response rate of 44.6% followed by pollution with a response rate of 39.2%. Figure 18 below lists the topic choices. Almost all of the teachers surveyed would prefer for educational materials to be hands-on activity loan kits (Fig. 19).

Figure 18: Which topics would you like developed into education materials?

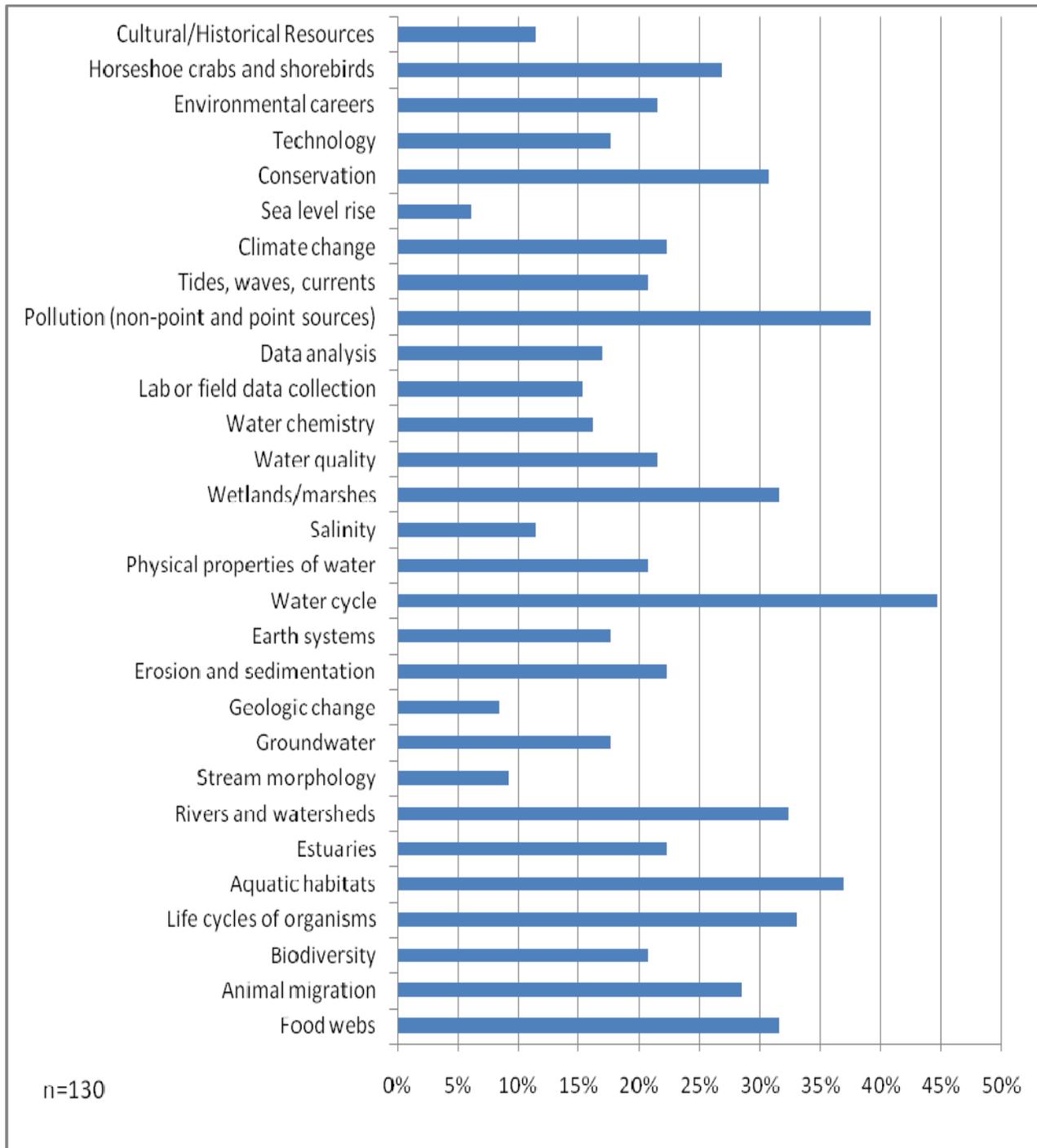
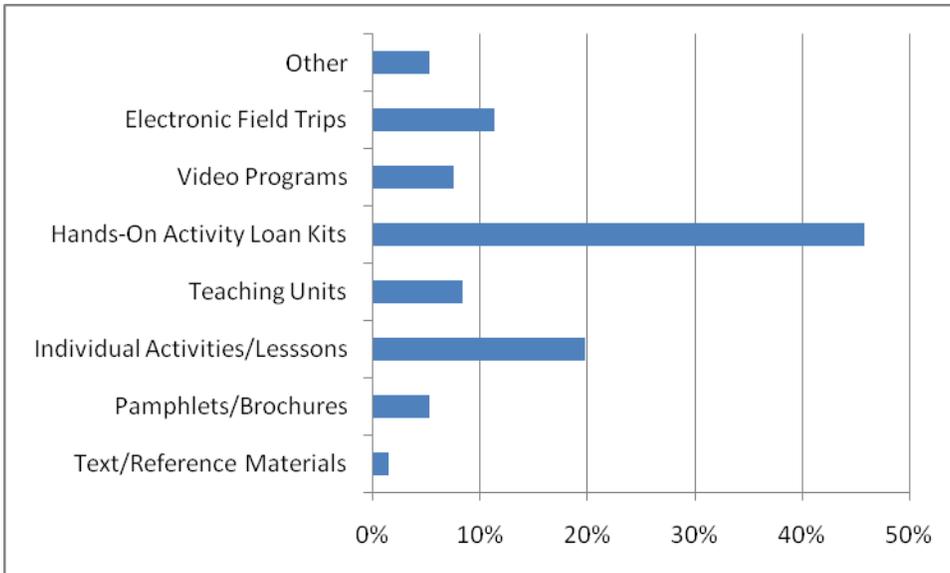


Figure 19: What form would you prefer the information about the above topics to be presented?



Teacher Professional Development

When it came to the question of professional development, most respondents were interested in receiving training on conducting hands-on activities and using new websites (Fig. 20). Other professional development areas include facilitating inquiry activities, incorporating new lab activities into the classroom, and training on science content. Educators would like educational materials to be packaged in kits or downloadable from the web (Fig. 21).

Figure 20: What type of professional development training do you need?

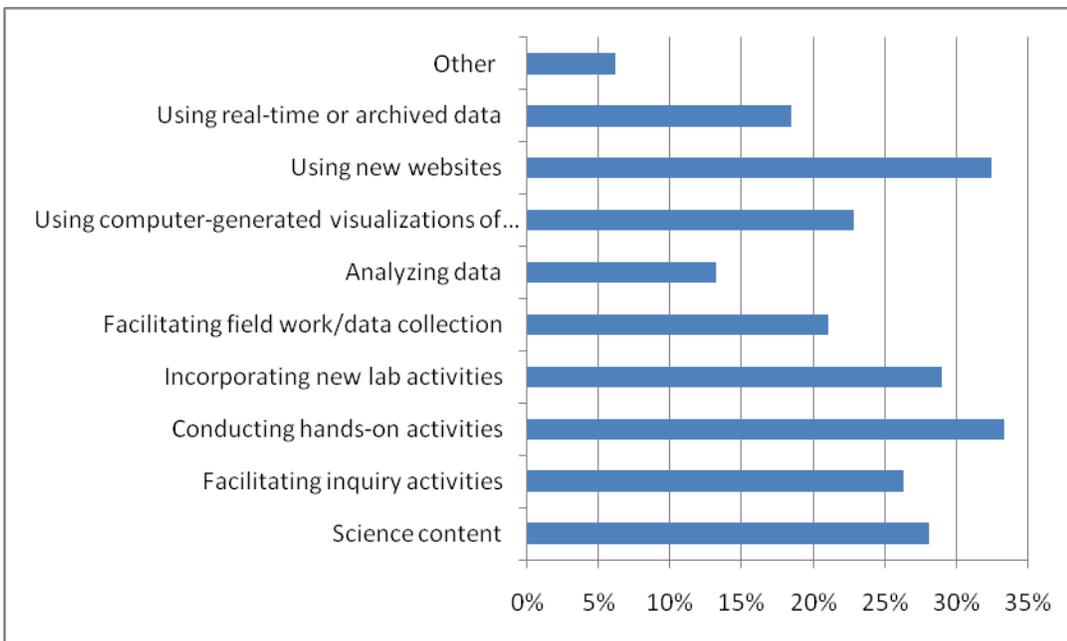
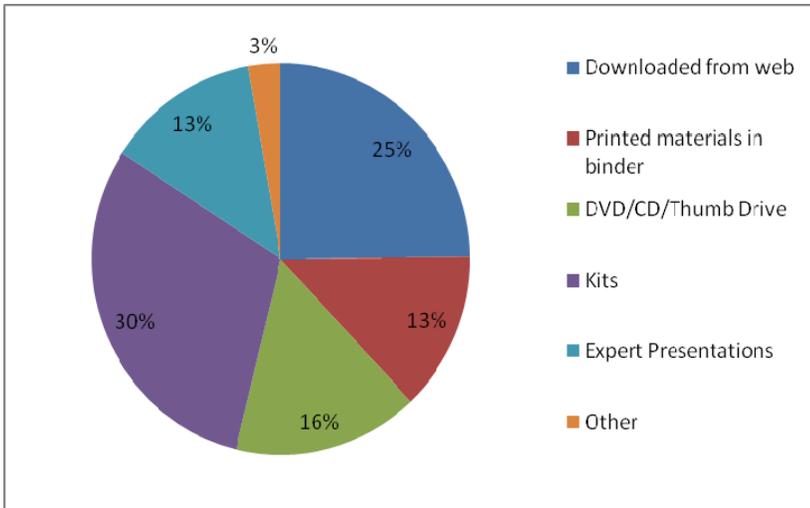


Figure 21: How would you like to receive educational materials?



The two preferred modes of learning among teachers were demonstrations, lecture/direct instruction, and field studies (Fig. 22). The respondents indicated the best time for professional development would be in the summer, on a weekday, and in the morning (Table 2). In addition they stated that the best length for training would be from one-hour to a full day (Table 2). Approximately 37% of teachers would be willing to travel more than 30 miles to attend professional development training (Fig. 23). Only 8% of respondents would be willing to pay over \$50 for a full day of training; although, 17% would be willing to pay over \$25 (Fig. 24). Fifteen percent of teachers responded by selecting “other” and although the details they provided varied, most stated that they would not be willing to pay out of pocket for training. They believe the training should either be free or should be paid for by the school district.

Figure 22: Preferred mode of learning

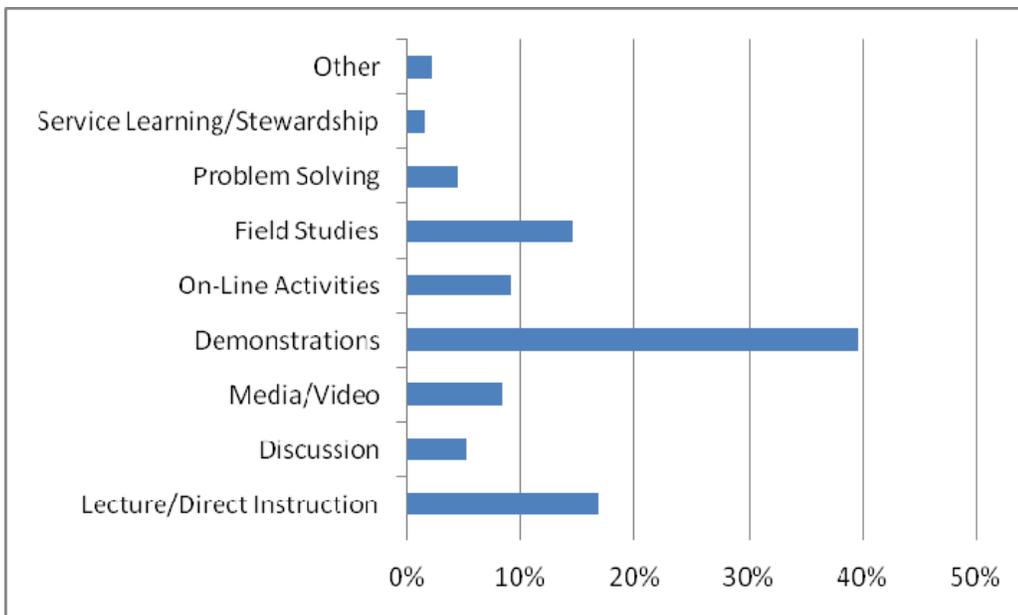


Table 2: When is the best time for you to attend professional development?

Preferred Time for Professional Development					
Season	Spring	Summer	Fall	Winter	Any Season
	28.1%	46.3%	7.4%	1.7%	16.5%
Day of Week	Weekdays	Weekends	Any Day		
	72.7%	10.0%	17.3%		
Time of Day	Morning	Afternoon	Evening	Anytime	
	51.4%	12.1%	15.9%	20.6%	
Session Length	One-hour or Less	One-hour - Half Day	Half Day - Full Day	2 Days or More	Any Length
	7.5%	39.6%	30.2%	0.0%	22.6%

Figure 23: How far would you travel to attend professional development training?

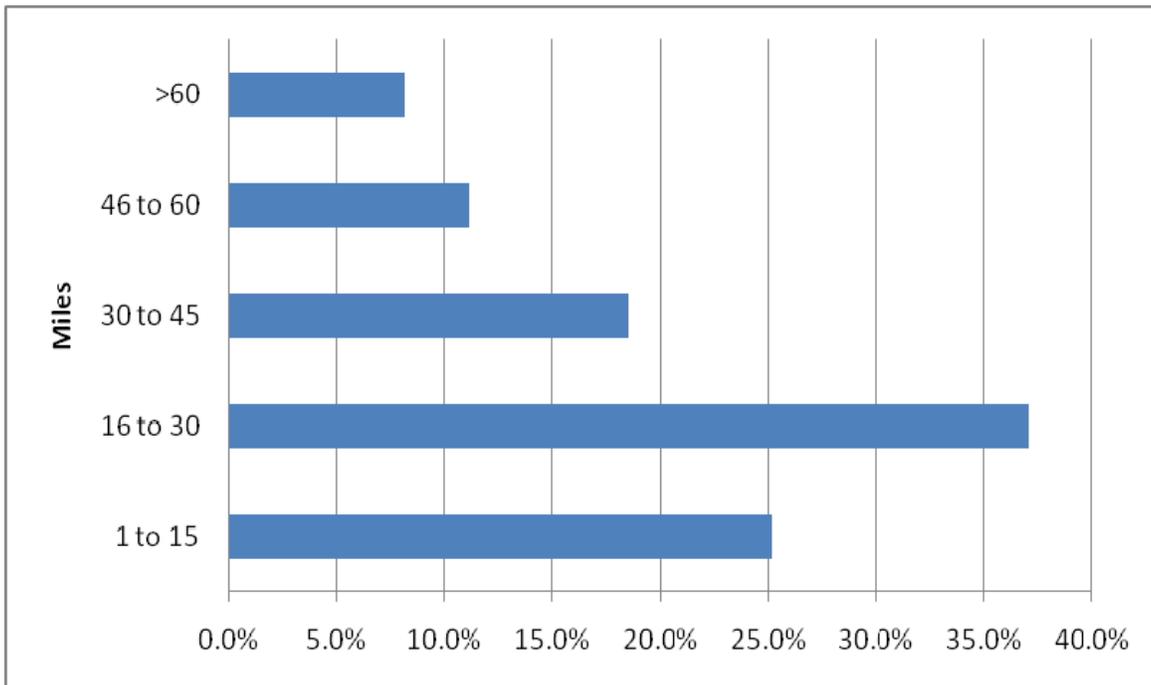
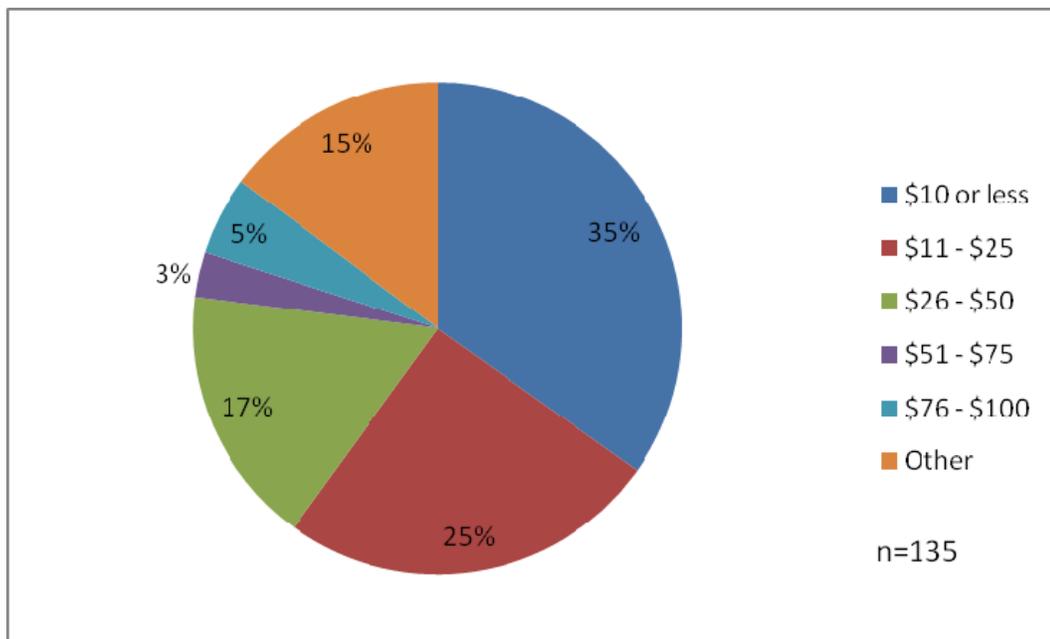


Figure 24: How much would you be willing to pay for a full-day of training?



A large percentage of the teachers find out about professional development from direct e-mail (67.6%), the school principal (46.5%), and through the Delaware Teacher Center Catalog (45%), followed by word of mouth (Fig. 25). The respondents indicated that timing of workshops (65.2%), registration fees (51.9%), and the fact that the trainings are not relevant to what they teach (46.7%) as the three main factors which affect their participation in professional development (Fig. 26).

Figure 25: How do you find out about professional development opportunities?

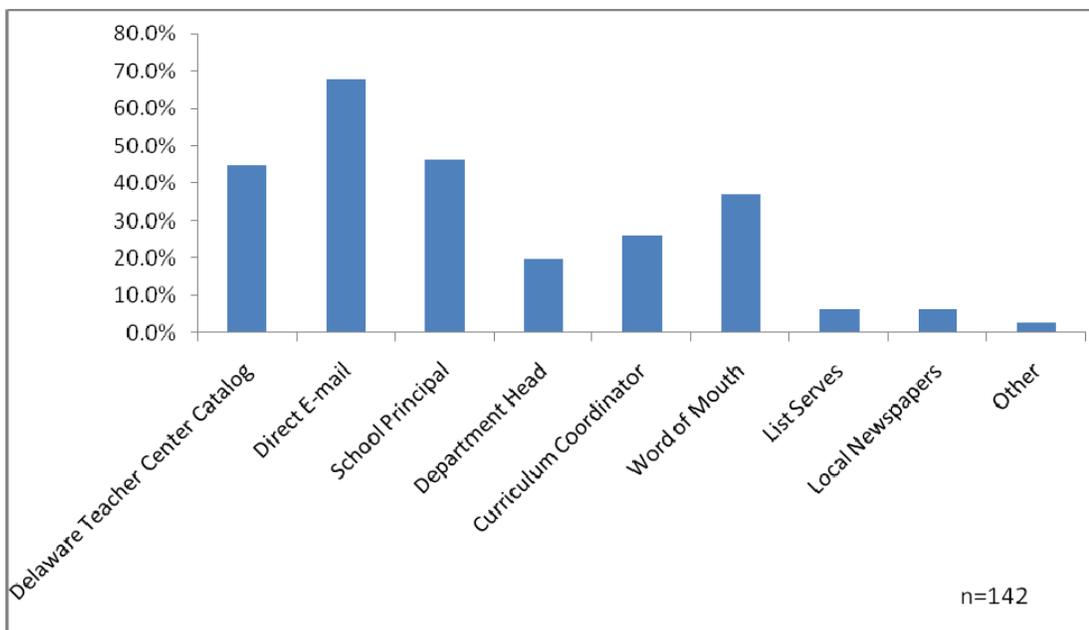
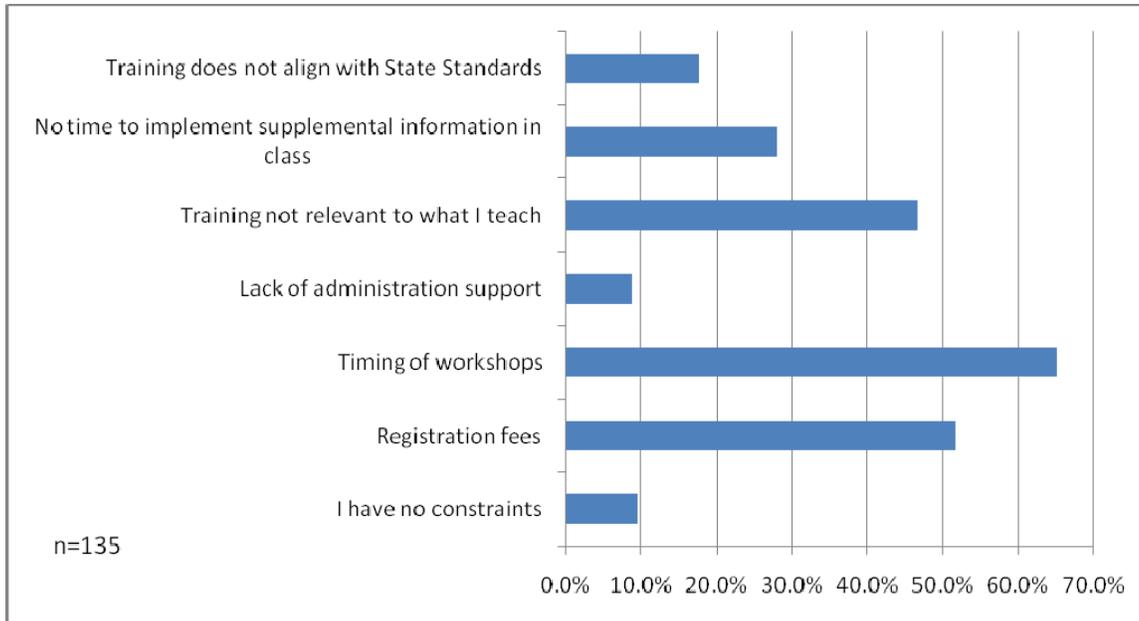


Figure 26: What factors affect your participation in professional teacher development?



Needs Assessment – Survey Instrument

See Appendix A - Reserve Education Needs Assessment Survey.