



2005 Decision Center for a Desert City Water Education Provider Survey Summary

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Introduction

One objective of the education outreach component of Arizona State University's Decision Center for a Desert City (DCDC) is to determine what role we can play in enhancing the Water Education programs already serving the Greater Phoenix Area. To determine that role, in spring 2005 we developed a Water Education Provider Survey to identify water education providers (WEP), and to determine audiences, content, goals, and communication tools used by these local organizations.

We identified WEPs from a variety of organizations including: cities/municipalities, non-profit organizations, museums, government agencies, and private industries. Seventy-seven surveys were sent to these different organizations. The response rate was 28.6% for individuals and 41.7% for organizations, with twenty-two surveys being completed and returned from twenty different organizations (*Table 1*). From the respondents, seven WEPs were asked to participate in face-to-face interviews for more in-depth information.

Table 1. Comparison between organizations receiving and completing water education survey by organization type.

	<i>Identified</i>		<i>Response Totals</i>	
	<i>Individuals</i>	<i>Organizations</i>	<i>Individuals</i>	<i>Organizations</i>
Water Providers	43	18	11	10
Non-Profit	16	15	9	8
Other Government	16	13	1	1
Private Industry	2	2	1	1
Total	77	48	22	20

Survey questions were arranged in four categories: Target Audience, Program Objectives, Communication Tools, and Program Overview. Face-to-face interviewees were asked questions in the same categories as well as questions regarding development and evaluation of their program, collaboration with other educators, and needed areas of improvement within their programs.

Target Audience

The survey asked respondents to identify the geographic region and demographic characteristics of the audience they serve within Arizona. Within geographic characteristics, the most commonly identified geographic regions being served were within the larger cities/municipalities including Gilbert, Phoenix, and Tempe. Second most commonly identified regions were Apache Junction, Avondale, Carefree, Glendale, Goodyear, Mesa, Paradise Valley and The Salt River Watershed (*Appendix D*). The least common identified communities being served included outlying areas that have lower populations including Arlington, Morristown, New River, Tonopah, Tortilla Flat, and Wittman.

For demographic characteristics, WEPs most commonly identified teachers as their targeted audiences, followed by students in grades K-6, grades 7-12, and then the public at large (Appendix 2). Face-to-face interviews also supported these findings.

Program Objectives

The survey listed 31 possible program objectives and asked WEPs to select and rank how the statement related to their organizational objectives. Rankings were based on the following categories: Main Objective, Objective, Objective Currently Unable to Address, Not an Objective and Opposes Objectives.

The survey indicates that WEP’s have multiple program objectives (Appendix 3). Eighty percent of the organizations ranked the seven topics listed in Table 2 as either a main objective or an objective of their organization. Presenting facts about water issues, and promoting indoor and outdoor water conservation were also identified as main objectives by fifty percent of the respondents. Addressing state educational standards through water programs and teaching about drought, were also commonly identified as main objectives for many of the WEPs.

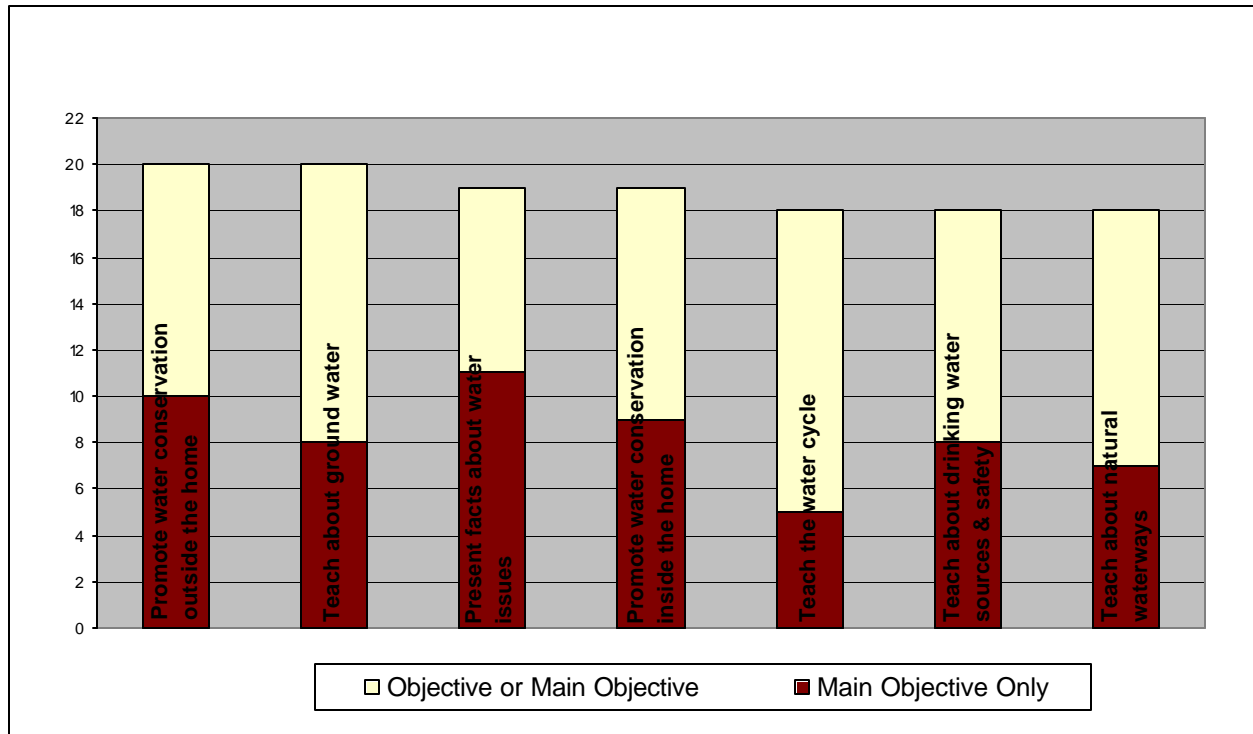
The most frequently identified objectives were not always the top-ranked main objective (Chart 1). Main objective priorities varied according to WEP organization types. These differences were also noted in the face-to-face interviews. Those WEPs associated with cities/municipalities identified indoor and outdoor water conservation to be a main education focus. However, three interviewees, whose main focus was teacher training, felt that the mission of their education programs were to provide teachers with information that focused on Arizona specific topics, with conservation being only a portion of that. This was not a listed objective on the written survey, but was mentioned during interviews.

Table 2. Comparison between most and least frequent objectives

<i>Most Frequent Objectives</i>	<i>Least Frequent Objectives</i>
<ul style="list-style-type: none"> ● Promoting outdoor water conservation ● Teaching about groundwater ● Facts about water issues ● Promoting indoor water conservation ● Teaching about the water cycle ● Teaching about drinking water sources & safety ● Teaching about natural waterways 	<ul style="list-style-type: none"> ● Teaching to lobby for water policy ● Training individuals to restore wetlands ● Teaching water recreation ● Teaching water chemistry ● Building trust in science through water programs ● Encouraging debate about water

Another interesting survey result indicated that explaining water reclamation was considered to be one of the top objectives and a main objective of six WEPs. Interviews with WEPs associated with cities/municipalities suggested that they have attempted to address citizen concerns regarding effluent/reclaimed water but felt their outreach efforts on this subject have not been adequate. One interviewee stated that information on the subject was difficult to locate.

Chart 1. WEP Objectives



Those topics least likely to be an objective of local WEPs are also indicated in Table 2. These included teaching to lobby for water policy (9%), training individuals to restore wetlands (14%), teaching about water recreation (18%), teaching water chemistry (36%), building trust in science through water programs (36%), and encouraging debate about water (36%). These topics were not mentioned in interviews with the exception of one interviewee who felt that teaching about constructed wetlands could be a topic of importance in Arizona.

Communication Tools

The most frequently cited communication methods between WEPs and their audiences (*Table 3*) were water activity books for children and booths exhibiting water issues at community events. Eighty-two percent of WEPs make use of both. Children’s activity books were most commonly distributed through schools and less frequently distributed directly to families and through libraries. Other important communication tools were articles in local/regional media (77%), teacher workshops (73%), television commercials (64%) and newsletters (63%).

Table 3. Communication Methods Used

<i>Communication Type</i>	<i>Total Respondents Using</i>
Booths about water issues at community events	82%
Water activity books and guides for children	82%
Water articles in local/regional print media	77%
Teacher workshops about water	73%
Television commercials	64%
Newsletter about water	63%

WEPs providing teacher workshops/education mainly targeted K-12 educators (81%), with the focus being on K-8 teachers (41%) (Chart 2). A typical workshop educated teachers on water issues, covered multiple topics and provided the teachers with materials and specific water lesson plans, and frequently lasted more than one day (Table 4). Although there are several local WEPs that have created workshops and materials for teachers, interviewees reported that the majority of teacher workshops are done through one provider, Project WET.

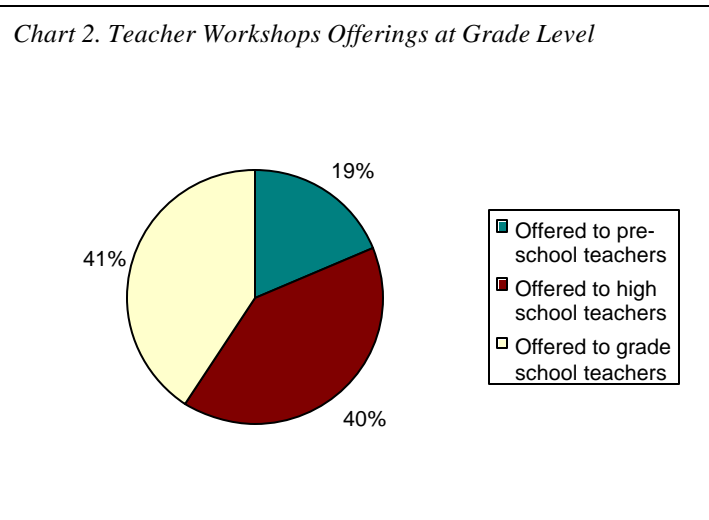


Table 4. Communication Tools Use Overview

Communication Type with Multiple Languages Offered	Total Respondents Using
Newsletter	57%
Television Commercials	50%
K-12 Activity Books	33%
Teacher Workshops about Water	Total Respondents Using
Educated teachers on water issues	75%
Provides specific water lesson plans	75%
Covers multiple topics	62%
Last greater than one day	43%
Communication Evaluation	Total Respondents Using
Newsletter evaluation by survey	50%
Teacher workshop evaluation by follow-up	42%

Effectiveness of communication techniques

During face-to-face interviews, WEPs indicated several formal and informal measures they used to determine the effectiveness of their programs (Table 4). For teacher education programs, fifty percent of all WEPs interviewed indicated using surveys to gain feedback on the attendee’s impressions of programs and resources. Additional approaches for evaluating communication methods mentioned during interviews included contact rate; the number of individuals who contacted the WEP’s office after a particular communication campaign. WEPs had the most confidence in the effectiveness of workshops. Specifically, they identified efforts to include grade school teachers, high school teachers, and include information on water issues to be effective.

Newsletters were also viewed as highly effective. Those that included graphics to explain concepts and topics suggested by water educators were perceived as the most effective components of newsletters. Newsletters were available in print (59%) and online (50%). Regular publishing of newsletters was also indicated to be effective.

The effectiveness of the communication tools might be enhanced by providing more materials in multiple languages especially given the large number of non-English speakers in the Phoenix area. Only a small majority of WEPs using television commercials and newsletters provide them in multiple languages and less than half provide children’s activities books in multiple languages (Table 4).

Program Overview

In program overview WEPs were asked four questions to identify their program’s strengths, challenges, any content needed, as well as give any suggestions for K-12 water education in the Valley. Eighty-six percent of WEPs answered at least a portion of these reflective questions in this section.

Strengths

Fifteen WEPs commented on the quality of their outreach materials and design of their program. Comments mentioned included lesson plans that are “aligned to state standards”, “active, hands on...not canned”, “lessons can be used independently”, “covers a wide range of users”, and “engaging”.

Number of contacts, associations and high visibility was a strength mentioned by five different organizations. Two WEPs noted staff enthusiasm and dedication as strengths. Three WEPs associated with cities/municipalities noted collaboration with other organizations as strengths. The latter strength was also mentioned during interviews.

Table 5. Strengths, Challenges and Content Needed by WEPs

<i>Strengths Identified of WEPs</i>	<i>Challenges of WEPs</i>	<i>Content Needed by WEPs</i>
<ul style="list-style-type: none"> • Lesson plans aligned to state standards • Active, hands-on lessons • Lessons that can be used independently • Lessons that cover a wide range of users • Number of contacts, associations and high visibility • Staff enthusiasm and dedication 	<ul style="list-style-type: none"> • A need for additional staffing • Time for education/outreach purposes • Need for program evaluation • Need for additional and diverse funding opportunities • Population growth • Meeting the needs of diverse population 	<ul style="list-style-type: none"> • Information on climate change/drought, reclaimed water, and urban water issues. • Choices in materials and/or workshops available for their use • Communication between WEPs • Collaboration

Challenges

The most common challenges were identified as: a need for additional staffing or time for education/outreach purposes, mentioned by six WEPs. Five WEPs considered a need for program evaluation as their organization's biggest challenge, and four WEPs mentioned a need for additional and diverse funding opportunities. Population growth was also mentioned as a challenge by one WEP.

Each of these challenges were also mentioned in interviews. The majority of interviewees stated that their programs needed to develop better evaluation tools. Interviewees felt including long-term participant feedback could strengthen their programs.

Concerns relating to meeting the needs of Spanish-speaking, different socioeconomic, and geographically distant populations were also mentioned as a challenge during several interviews as well as on one written survey.

Content needed

Reflective survey responses on content needed by organizations included information on climate change/drought, reclaimed water, and urban water issues. These content challenges were also mentioned in six interviews as the interviewees stated there is a lack of information on these topics in their programs.

Five WEPs also noted a desire to have choices in materials and/or workshops available for their use. As one respondent noted, "there needs to be a program that addresses the information in a fun and interactive way. Currently there is only one vendor that meets that criteria."

Communication between WEPs was another challenge mentioned in the survey and during interviews. Some WEPs felt there is some isolation among water educators and that "collaboration is key if water education is going to be truly successful". Collaboration was also mentioned as being necessary between educators and the Arizona Department of Education in the hopes "to include water education in curriculum and standards."

Discussion

The WEP survey was created, in part, to determine the role DCDC can play in enhancing Water Education programs in the Greater Phoenix Area. An analysis of the survey results suggests that WEPs need assistance with the following areas : information on climate change, drought, reclaimed water and urban water issues, choices in material and program availability, materials in Spanish, program evaluation, and the needs for additional staffing and funding.

DCDC could provide assistance with information on the topics of climate change, drought and urban water issues. As DCDC research primarily focuses on the relationships between climatic conditions and water decision-making, information sharing on these important topics could be valuable. DCDC's education staff could work with researchers to provide current information to WEPs for use in their newsletters and publications. A key characteristic of quality environmental education materials is that materials should reflect well-documented facts about subjects and issues (North American Association for Environmental Education, 2004). Materials

should also be set in a context that includes social and economic as well as ecological aspects (North American Association for Environmental Education, 2004). By DCDC education staff providing the latest research results from DCDC they can assist WEPs in providing the most up-to-date research about the area in which they live. The results can be shared via graphs, short vignettes, the Ecology Explorers web site and other formats that WEPs identify. The DCDC education team could work to translate many of the resources into Spanish. This would allow many more students to be able to share information with their families and receive the information in their primary language. Additionally, DCDC education staff could collaborate with the WEPs providing teacher workshops to develop activities/lessons that address some of the issues based on DCDC research.

DCDC is not in a position to address additional staffing or funding needs of the WEPs, but could potentially play a role in coordinating efforts by WEPs to evaluate their programs. For example, DCDC could assist the WEPs in writing grants to obtain funding for creating assessment tools that could be used by multiple WEPs.

The DCDC education team has organized a forum to address the topics identified by the survey in which they can assist WEPs. This forum will allow WEPs to give further input on the recommendations made above. The forum will also allow for WEPs to meet and talk about possible collaborations.

References Cited

North American Association for Environmental Education. 2004. Environmental Education Materials: Guidelines for Excellence. Washington: NAAEE. 23pp.

Appendix 1. Target Audience by Geographic Range

Location	Total Respondents	Location	Total Respondents
Arizona	22	Litchfield Park	3
Maricopa County	22	Luke Air Force Base	4
Salt River Watershed	6	Mesa	5
Aquila	3	Morristown	2
Anthem	4	New River	2
Apache Junction	6	Palo Verde	3
ASU	7	Paradise Valley	5
Arlington	3	Peoria	7
Avondale	6	Phoenix	9
Buckeye	4	Queen Creek	6
Carefree	6	Rio Verde	3
Cashion	2	Scottsdale	6
Cave Creek	5	Sun City	4
Chandler	4	Sun City West	4
Desert Hills	4	Sun Lakes	4
El Mirage	4	Surprise	5
Fort McDowell	4	Tempe	9
Fountain Hills	5	Tolleson	3
Gila Bend	3	Tonopah	2
Gila Bend AF Auxillary Field	3	Tortilla Flat	2
Gilbert	7	Waddell	2
Glendale	6	Wickenburg	3
Goodyear	5	Wittman	2
Guadalupe	3	Youngtown	2
Higley	4	Other (not specified)	1
Laveen	3		

Appendix 2. Target Audience by Demography

	Total Respondents
Teachers	20
Students, Grades K-6	17
Students, Grades 7-12	16
General Public	15
Parents	9
Water Professionals	9
College Students	8
Public Representatives	7
Spanish Speaking Households	6
Park Visitors	3
Museum Attendees	2
Other (not specified)	2

Appendix 3. Cumulative Responses to Program Objectives

Listed Objective	Objective or Main Objective	Main Objective Only	Unable to Address	Not an Objective
Promote water conservation outside the home	20	10	0	2
Teach about ground water	20	8	0	1
Present facts about water issues	19	11	1	0
Promote water conservation inside the home	19	9	0	3
Teach the water cycle	18	5	2	1
Teach about drinking water sources & safety	18	8	2	1
Teach about natural waterways	18	7	2	1
Address state educational standards through water programs	17	9	1	2
Teach about precipitation	17	6	0	3
Explain water reclamation	17	6	0	3
Teach about drought	17	9	1	2
Teach cultural significance of water	17	4	1	2
Address teacher needs for water lesson materials	16	8	2	2
Foster continued exploration on water issues	16	7	1	3
Improve environmental literacy through water programs	16	7	2	2
Explain the history of municipal water	15	5	2	4
Promote watershed protection	14	5	3	4
Teach about engineered waterways	14	5	3	3
Build community through water programs	14	4	2	3
Teach about the services wetlands provide to humans	11	1	0	9
Recruit volunteers to work on water programs	10	5	1	7
Train individuals in water monitoring and testing methods	10	3	3	7
Teach about aquatic plant & animal life	10	2	2	9
Present opinions about water issues	10	1	1	8
Explain new water policy	9	2	3	7
Encourage debate about water issues	8	2	4	8
Build trust in science through water programs	8	1	2	8
Teach water chemistry	8	3	0	13
Train individuals to restore wetlands	3	1	3	12
Teach about water recreation	4	0	3	11

