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RESEARCH ARTICLE

New approaches to facilitate learning from youth: Exploring the use of Photovoice in identifying local watershed issues

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ABSTRACT

In urbanized areas, incorporating residents' concerns and priorities into the stormwater management debate has focused on adults rather than youth. This study used Photovoice, a tool that includes photographs taken by youth, to uncover youth concerns and perceptions about their local watersheds. This study consisted of a comparative study of two watersheds. Twenty students produced 468 photographs. Although both groups of students shared common themes regarding stormwater and pollution, these themes differed in level of concerns over local environmental issues, sentiments with particular features in their local watersheds, and concerns about local watersheds. From a methodological perspective, Photovoice provided a way of capturing youth perspectives and to identify important features and issues in their respective local watersheds.

KEYWORDS

participatory research; Photovoice; visual methodologies; watershed; youth

Introduction

In environmental education research, student attitudes and factual knowledge tend to be more emphasized than education preferences and experiences (Rickinson, 2001). Rickinson (2001) observed the need for a broader diversity in theoretical and methodological approaches in environmental education research. Briggs, Stedman, and Krasny (2014) suggest that photo-based visual methods could lead to deeper understandings regarding the outcomes of place-based education. Photovoice as a methodology plays a potentially critical role in identifying and highlighting community voices concerning local watershed, particularly stormwater concerns and issues.

Stormwater regulations and issues are driving stormwater management efforts in urban areas. However, improving stormwater management is limited by prioritizing the technical solutions while not adequately incorporating the social dimensions into the planning and decision-making process (Cettner, Ashley, Hedstrom, & Viklander, 2014). Part of this is because community-related watershed concerns often differ from regulatory requirements. For example, community issues related to stormwater may include concerns over flooding, trash, and pollution. In contrast, stormwater regulations focus on managing quantities of nitrogen, phosphorous, and total suspended solids in stormwater runoff and in water bodies.

Barbosa, Fernandes, and David (2012) observe that the key to improving stormwater management is to identify solutions and opportunities at different scales. Incorporating local knowledge and

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community involvement in identifying opportunities may help address these challenges. Research suggests the need to encourage community education and participation and then incorporate these perspectives into stormwater management approaches (Farrelly & Brown, 2011; Söderberg, 2002). Corburn (2003, p. 420) highlights the need for planners to learn new approaches to incorporate local, contextual community knowledge to help planners navigate the various and sometimes conflicting issues from multiple stakeholders while also addressing potentially conflicting pressing community issues.

Despite existing research on the benefits of incorporating adult residents and stakeholders' concerns in stormwater management (Herringshaw, Thompson, & Stewart, 2010; Pahl-wostl, 2005), little is known about engaging youth perspectives of local watersheds. One promising approach to gain youth perspectives is through Photovoice, a method that incorporates multiple perspectives that include participant place experiences and understandings (Annang et al., 2016; Plunkett, Leipert, & Ray, 2013; Wang, 1999; Wang & Burris, 1997; Wang, Morrel-Samuels, Hutchinson, Bell, & Pestronk, 2004).

Although stakeholders in stormwater management policy and planning discussions often include local residents, rarely do they include youth voices and youth perceptions. Several reasons for the need to understand youth perceptions of their local environments exist. Tunstall, Tapsell, and House (2004, p. 182) highlight the importance of understanding how youth perceive their environment given that these perceptions often differ markedly from adult perceptions. In a study comparing how children and adults differed in their perceptions of water in the landscape, Yamashita (2002, p. 3) found that nearsighted elements matter more, whereas mid- to farsighted elements were more important for adults. Mordock and Krasny (2001) observed that engaging students in community research enhances the goals of environmental education that highlight action and change.

In Washington, DC, and in urban parts of Maryland, stormwater management efforts are being driven by the need to save the Chesapeake Bay, thus directly impacting people's neighborhoods. As one part of a larger study examining the social dimensions of stormwater, we developed the Photovoice study to understand youth perspectives associated with their local watersheds. This Photovoice dimension was the one method used by our research team to understand youth perspectives of their local watersheds. This methodology differed from the stakeholder interviews and surveys or residents that focused on barriers and incentives regarding stormwater management. In contrast, for the Photovoice component of the project, we asked youth to simply photograph what was in their local watersheds, rather than focusing on stormwater best management practices. By working with youth in two watersheds, we explored the effectiveness of using Photovoice as a tool for working with youth in identifying pertinent local watershed issues, elements, and places.

The role of Photovoice in environmental education

Two dimensions of broadening environmental education include community-based action research and place-based education around local environments. Mordock and Krasny (2001) observed that engaging students in community research enhances the goals of environmental education that highlight action and change. In their study of students' developing understandings of water in environmental systems, Covitt, Gunckel, and Anderson (2009) recommended that informal and formal educators provide experiences with water systems to reveal invisible landscape connections.

Frequently used in public health arenas (Annang et al., 2016; Wang, 1999; Wang & Burris, 1997), Photovoice consists of first having participants take photos, with the participants selecting what to photograph. The second stage of Photovoice is having the participants discuss the photos. Photovoice is a method that incorporates multiple perspectives that include participant place experiences and understandings (Annang et al., 2016; Plunkett et al., 2013; Wang et al., 2004; Wang & Burris, 1997). The use of participants selecting and taking photographs and telling stories about these photos offers a significant role in place-based education and youth awareness of their surroundings (Briggs et al., 2014; Nykiforuk, Vallianatos, & Nieuwendyk, 2011; Goodhart et al., 2006).

Photovoice has also been used as a tool to give voice to individuals who may otherwise remain silent, including youth (Annang et al., 2016; Palibroda, Krieg, Murdock, & Havelock, 2009; Wilson

et al., 2007; Wang & Burris, 1997). One of the growing uses of Photovoice is a way to learn more about the built and social environments (Nykiforuk et al., 2011). Dennis, Gaulocher, Carpiano, and Brown, (2009, p. 467) propose that everyday knowledge comes from the integration of visual, narrative, and locational forms of knowledge. One method of acquiring everyday knowledge is with the use of Photovoice. Goodhart et al. (2006) found that Photovoice empowered youth to become more aware of their surroundings.

Recent research examining the role of Photovoice and photo-elicitation highlight potential contributions of these methodologies. These visual, qualitative approaches are based on a rationale used to capture how respondents connect unobserved thoughts and feelings and experiences (Richard & Lahman, 2015; Hergenrath, Rhodes, Cowan, Bardhoshi, & Pula, 2009; Patton, 2002). Photo-elicitation, unlike Photovoice, makes the visual data secondary in its analysis (Briggs et al., 2014). Briggs et al. (2014, p. 164) suggest that photo-elicitation reduces or prevents romanticizing children's relationships to place. Briggs et al. (2014) found that photo-elicitation contributes to theorizing and assessing children's sense of place-based education.

Research design

Our research design incorporated a modified Photovoice approach as a method to understand youth perceptions of the watershed. Photovoice is a promising method to explore these perceptions for two reasons. The first is that Photovoice can be analyzed visually through an examination of the photographs and qualitatively through the narratives around each photograph. Frequently used in public health arenas (Annang et al., 2016; Wang, 1999; Wang & Burris, 1997), Photovoice consists of first having participants take photos, with the participants selecting what to photograph. The second stage of Photovoice is having the participants discuss the photos.

Prior to our study, two of our team partners were working with a high school environmental science club in each watershed. Drawing from public health-based Photovoice methods, we developed a modified Photovoice approach that would fit within the limited time constraints of the environmental science clubs. Our university's Institutional Review Board office first reviewed all procedures and consent forms and then approved our application for this research.

Study areas

For this study, we selected two watersheds that drain into the Chesapeake Bay tributaries. The first site is located within a sub-watershed of the Anacostia River Watershed and the second site is located within sub-watershed of the Patuxent River Watershed (Figure 1). These two sub-watersheds share similar watershed characteristics, such as similarities in percentages of residential land uses; they differ in socioeconomic contexts and in population density (Table 1). In addition, the Anacostia sub-watershed site includes paths incorporated along a stream, whereas the Patuxent sub-watershed featured a large lake with a significant greenway and trail system.

Both areas have an active Watershed Stewards Academy (WSA) that works with local residents. Coordinators and educators, WSAs also collaborate with local high school environmental clubs. Two of these high schools, one in each of the two study areas, were selected for this Photovoice project.

Photovoice procedure

We developed our Photovoice procedure for this project by first drawing from several Photovoice sources (Annang et al., 2016; Palibroda et al., 2009; Wang, Morrel-Samuels, Hutchison, Bell, & Pestronk, 2004; Wilson et al., 2007) and then modifying the protocol to fit within the project parameters. Although Photovoice in public health research often lasts approximately two hours per meeting to allow for dialogue and discussion, our study constraints required a modified approach to accommodate the approximately half hour time limit for each meeting with the participants. Rather than having a

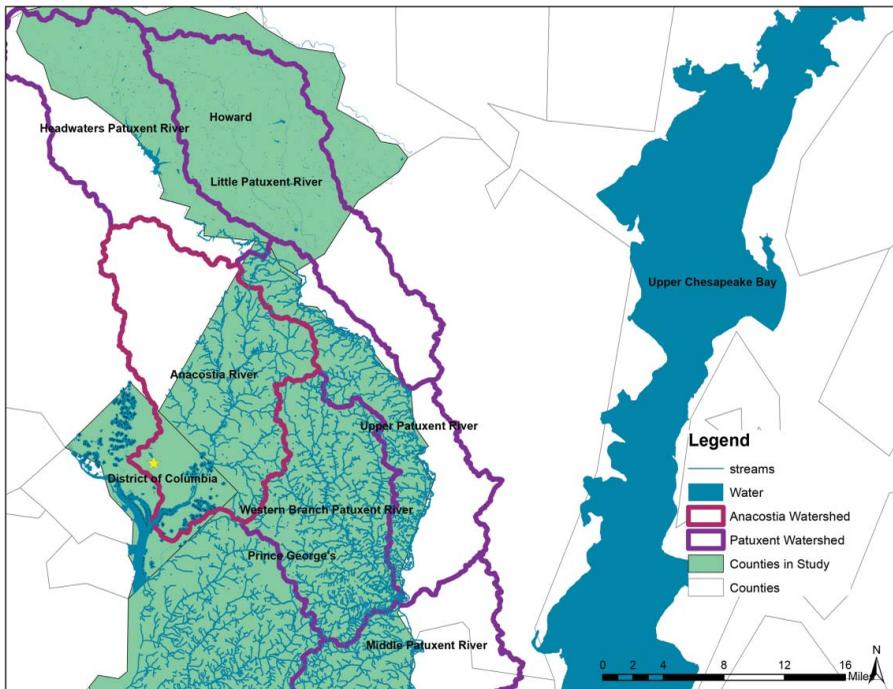


Figure 1. Map of the Anacostia River Watershed and the Patuxent River Watershed.

meeting for discussion of the photos, we instead asked that participants complete the worksheets with their own photographs.

The Photovoice procedure involved several steps at both high schools. The first step was prior contact with the two science club teachers (one per school), including sending the informed consent letters to each environmental science club teacher for the students and their parents to read and sign in advance. During the first meeting with the environmental club students and the environmental club teacher, we introduced participants to the scope of the project, reviewed the consent process, gave each participant one disposable camera, showed them how to use the disposable camera, distributed the youth assent forms and anonymous intake forms, and reviewed the procedures.

Participants were asked to take 25 or more photos of any places or features, including streetscapes, streams, etc., within their local watersheds. We added that these could be elements or places that they liked or did not like. We also suggested that these places be water related. The examples that we

Table 1. Watershed characteristics for each study area.

	Anacostia	Patuxent
Median Household Income (\$1999)	\$45,071	\$70,691
Population Density (mi ²)	7,553	4,309
Predominant Ethnicity	95.2% (African American)	67% (White)
Nitrogen Load (lbs/mi ² /year)	5,400	5,300
Phosphorus Load (lbs/mi ² /year)	730	360
TSS Load (tons/mi ² /year)	93	210
Watershed Size (square miles)	3.8	1.9
Percentage of the watershed that is residential	70	64
Percent Impervious Surfaces	29	32

Sources: Anacostia Watershed Restoration Partnership, 2009; Center for Watershed Protection and TetraTech, 2005; U.S. Census, 2010. *Please note:* The watershed characteristics for each site are for the subwatershed of the Anacostia Watershed and for the subwatershed of the Patuxent Watershed.

discussed as examples were photos of their local streams or lakes. We asked that the students not take photos of people or places outside of their local watershed. An incentive of \$60 for the completed study was offered for the complete set of 25 photos that did not include people or were taken outside of their local watersheds.

Intake forms were used to anonymously collect information about student age, gender, proximity to a stream or lake, and frequency of flooding. Signed parental consent forms, youth assent forms, and anonymous intake forms were collected at the end of the first meeting. Between the first and second meetings at each school, several interim steps were needed to prepare for the second meeting. The cameras were collected from the students by the environmental club teacher and then by a member of the research team. The photographs were developed while keeping each participant's collection of photos separate from other participant photos. Each participant's photos were compiled into a worksheet and coded with that participant's identifying number.¹

During the follow-up meeting at each school, we met with the environmental club participants and the environmental club teacher to learn about the images that participants selected. At this meeting, we explained the follow-up procedure and then distributed each individual worksheet to the respective student who had taken those particular photographs. Participants then completed the worksheets, which were then collected. Although the photos in each worksheet differed, the instructions remained the same.

Participants were asked to select 10 images from the total number of photos that they had taken and to write a brief narrative for each selected image. When we handed the worksheets to the participants, we asked verbal prompting questions such as whether this image was of a place where the participant lived, played, route to school or something else; what is happening in the photo; why the participant chose to take this particular photo; and what the photo is telling the viewer. The actual worksheets included written instructions on each page. These instructions observed that the following pages included all the photos that they had taken and asked participants to select 10 of the photos about which to write. Written prompting questions asked that for each of the 10 selected photos, to describe: (a) whether the photo represented where they lived, played, went to school, or something else; (b) What is happening in this photo; (c) why they decided to take this particular photo; (d) what the photo is telling us; and (e) to select the "thumbs up" or "thumbs down" icons to show whether the participant had positive or negative associations with the photo.

Data interpretation approach

Photovoice analysis includes an examination of the visual and narrative content in order to identify participant issues and priorities to contribute to explaining participant perspectives (Annang et al., 2016; Plunkett et al., 2013; Wang, 1999; Wang & Burris, 1997; Wilson et al., 2007;). Analyzing the visual and narrative data included several iterative stages. The first stage was previewing the data that included examining the photographs, narratives, and participant intents and perspectives. We looked for patterns in the visual images, narratives, and compared the images with narratives. The next stage included categorizing the data by doing a content analysis and by coding the data by themes.

Results

Twenty students produced 468 photographs ($n = 468$). Over half of the participants (64%) were female. The median age of the participants was 16 years. The Anacostia Site consisted of 9 participants and 221 photographs. The Patuxent Site included 11 participants and 247 photographs. A significant attrition was observed between the two meetings at each school since a number of students missed the follow-up meeting at their respective school. In addition, many participants were disqualified either because their photos did not make the minimum benchmark of 15 different photos taken within their local watersheds or because the photos were taken outside of their local watersheds.

Each participant selected at least 10 images to write brief narrations about what the image was about, its significance, and whether that image had a positive or negative association. Twenty-two

Table 2. Student associations to self-selected photographs.

	Anacostia	Patuxent
Positive	62.6%	68.5%
Negative	36.4%	31.5%
Both positive & negative	0.9%	0%

percent of the participants from the Anacostia Site and 36% of participants from the Patuxent Site exceeded the required number of 10 images to narrate. The average number of narratives for the Anacostia Site was 12; the average number for The Patuxent Site was 10.5.

Positive and negative associations

Table 2 demonstrates the percentages of positive and negative associations made for each of the two areas. Both sets of participants had relatively similar ratios of positive to negative associations made with the photos. Positive associations were made for 62.6% of the Anacostia participant photographs; the same association was made for 68.5% of the Patuxent participant photographs.

Figures 2 through 5 demonstrate four representative photos and the type of association attributed to each. Figure 2 is a representative positive image that was taken by an Anacostia participant. The narrative states that, “Pass by sometimes. It was raining and the creek was starting to go. I took [the photo] to show the natural beauty. It’s telling us that we need to try to keep places beautiful and don’t try to change/pollute.”

Figure 3 is a representative image (negative association) that was taken by an Anacostia participant. The narrative for this image reads, “Pass by sometimes. The creek is flowing. To show the trash in the creek. That our trash reaches the water and gets trapped.”

Figure 4 shows a representative image with positive associations that was taken by a Patuxent participant. The narrative for this image reads, “This photo represents a wetland area where I live which I often walk by. Frogs are coming up for the spring in the wetland area. I wished to capture and express the nature and importance of this wetland area. This photo tells us that this area of wetland is scenic, life-sustaining, and important, and should be protected and preserved.”

Figure 5 features a representative Patuxent image with a negative association. The narrative states: “This photo represents an area relatively near where I live where I sometimes walk my dog. [This is a photo of] a storm drain on a road [that] is leading to the Chesapeake Bay. [I took this photo because] I wished to show the storm drain and how easily any pollution on the road could reach the watershed. This photo is telling us that any pollution on a road could easily reach the Chesapeake Bay, and that

**Figure 2.** Anacostia representative photo (positive).



Figure 3. Anacostia representative photo (negative).

some action should be taken to reduce pollution on roads to prevent it from reaching the Bay if possible.”

Word trends in the narrative data

The narratives were reviewed to identify which words were most frequently mentioned. [Table 3](#) shows the frequency of word occurrences in textual trends for the narratives. Frequency was determined by counting word use once per photo change. The words, “water” and “pollute, -ing, -ed,” were mentioned frequently in both participant groups. The word, “water,” was mentioned 38 times for the Anacostia narratives and 47 times for the Patuxent narratives. The word, “Pollute, -ing, -ed” was mentioned roughly the same number of times (Anacostia: 14 times; Patuxent: 13 times).

We then examined the word trends in terms of clusters of words. In terms of water-related issues and features, Anacostia participants used the words, “Water,” (38 times), “Flood, -s, -ing, -ed” (18 times) and Patuxent participants instead most frequently used the words, “Water” (47 times), “Lake” (28 times), “Stream” (23 times), and “Watershed” (18 times).

A greater number of words with negative connotations appeared in the narratives for Anacostia participants than did the ones for the Patuxent participants ([Table 3](#)). Trash, pollution, and sewers dominated the Anacostia participant perspectives, whereas water dominated the Patuxent participants



Figure 4. Patuxent representative photo (positive).



Figure 5. Patuxent representative photo (positive).

(Table 3). Anacostia participants mentioned the word “trash” the most (43 times). In addition to trash, “sewer” was mentioned 18 times and pollution 14 times. In contrast, the Patuxent participants used the word, “water” the most often (47 times) with the word, “lake,” a second runner up in terms of use (28 times).

Overlapping dominant visual and narrative themes

The Anacostia participant narratives had dominant themes concerning trash, pollution, and sewers. This contrasted with the Patuxent participant narratives that had dominant themes regarding water and water-related features, e.g., stream and river.

After analyzing the narratives pertaining to the photographs and the visual content of the photographs, four dominant, overlapping themes emerged between the two groups: (1) water; (2) problems associated with the local watershed; (3) the relationship between the community and the watershed in terms of questions about who is responsible for taking care of the watershed; and (4) features related to stormwater management. The problems associated with the local watershed overlapped with issues of community. These overlapping themes included the identification of trash and pollution, the desire to stop trash/pollution, and the identification of individual(s) responsible.

The theme associated with stormwater management consisted of categories such as built stormwater infrastructure (storm drains, pipes), stormwater signage on storm drains (“Chesapeake Bay Drainage,” etc.), and implemented stormwater best management practices (downspout disconnections, rain gardens). One Patuxent narrative reads, “[This] is a picture of the rain garden. [I took the photo] because

Table 3. Comparison of narrative content analysis.

Anacostia Themes	Word Frequency	Patuxent Themes	Word Frequency
Trash,	43 times	Water	47 times
Water	38 times	Lake	28 times
Flood, -s, -ing, -ed	18 times	Stream, -s	23 times
Sewer	18 times	Nature	21 times
Pollute, -ing, -ed	14 times	Flow, -s, -ing	19 times
Drain, -s	14 times	Tree, -s	19 times
People	10 times	Watershed	18 times
Problem, -s	10 times	River	17 times
Litter, ing-	9 times	Creek	16 times
Community	8 times	Environment, -s, enviros	16 times
		Pollution, -ing, -ed	13 times
		Path	11 times
		Area	11 times

I really love the fact that we planted a rain garden. [This photo is telling us] that it is easy and beautiful to make environmentally friendly changes.”

The theme associated with water pertained to standing water; flooding, habitat, making connections between the water and the Bay, interest in learning more about water or a water-related issue; appreciation of views of water and views within the watershed, wildlife and wildlife habitat, and taking action to protect the water and the Bay. An Anacostia student narrative states, “In this picture, all the water and dirt run off from the construction site is being filtered within the sewer. I took this photo to show private businesses and companies that what they are doing is not right.” A strong sense of appreciation of views of the water and related naturalistic features, such as wildlife and wildlife habitat also exist. One Patuxent participant writes, “I took this photo because I find this lake very fascinating. [This photo] is telling you about how beautiful the lake is.” Another Patuxent participant writes, “[The photo is of] a large creek, flowing throughout the community. I think that it is a very beautiful and serene location.” An Anacostia participant comments, “I love this place [and] look around and see the natural beauty in things.”

One of the major differences between the two groups was the expression—visually and verbally—of pollution. Pollution was characterized differently through what was photographed and through the narratives. Trash was mentioned the most frequently in the Anacostia narratives (Table 3: 43 times). This trend was also echoed by the Anacostia participant photographs that revealed a high volume of trash, including along curbs, in front of stormwater sewer inlets, in fields, and in woods. This corresponds to what we know about the Anacostia Watershed given that trash in the Anacostia is a significant problem (AWS, 2008; NRDC, 2013).

In contrast, the volume of pollution was noticeably much less apparent through the photos and the narratives in comparison with the Anacostia participants. The Patuxent respondents mentioned pollution less frequently than the Anacostia respondents. In addition to the 43 mentions of trash, pollution was mentioned 14 times in the Anacostia. Although trash was not mentioned in the Patuxent, pollution was mentioned 13 times (Table 3). Pollution was also less visible in the photographs for the Patuxent. However, Patuxent participants still expressed concerns about pollution. The volume of pollution was noticeably much less apparent through the photos and the narratives in comparison with the Anacostia participants. One Patuxent narrative reads, “This photo represents an area in the water near where I live [and] where I like to walk. Although it is not obviously visible in the photo, oil is polluting a stream in a woodland area. I wished to show that this stream in this woodland area . . . is polluted by oil, and hopefully eventually result in the removal of the cause of the pollution. This photo is telling us that this stream, which may lead to the Bay, is polluted.”

Relating pollution to taking action was a shared aspect for both participant groups. One Anacostia participant writes, “This photo is telling us that any pollution on a road could easily reach the Chesapeake Bay, and that some action should be taken to reduce pollution on roads or prevent it from reaching the Bay, if possible.” Another example is from a Patuxent narrative: “I wished to bring up the issue of pollution in this stream as a result of litter, and hopefully get it solved. This photo is telling us that litter often collects in this stream and is not cleaned out naturally.”

The community theme included identifying “people” and “community” in terms of responsibility for current state of local environment, perceptions of community members being apathetic about protecting or cleaning up the environment and local watersheds, and strongly-worded expressions about need to clean up the environment. One narrative reads, “there is a lot of trash on the ground and I took this to show how the community mistreats the watersheds. Also took this to show how little people care about watersheds.” A second narrative states, “This [photo] shows trash and other waste build up inside a water sewer. With the buildup, no water is going to be able to get through causing floods. I took this to tell the people if we do not act now something drastic will happen to our ecosystem in the near future.”

Positive and negative associations with each watershed

A comparison between the results of the positive and negative associations (Table 2) to the results of the textual trends (Table 3) reveals what could be interpreted as conflicting results. Despite the differences between the two groups in relation to the mention of trash and pollution, the two groups had

similar ratios of positive to negative associations for the photographs, with roughly more than one third of the selected photos having negative associations (36.4% for the Anacostia youth; 31.5% for the Patuxent group).

Participants from both groups made more positive associations to the photos (Anacostia: 62.6%; Patuxent: 68.5%) than negative. However, in terms of textual trends within the narratives, more negative terminology (trash, sewer, pollution) was used in aggregate for Anacostia participants than the Patuxent participants (Table 3). One interpretation is that despite our classification of certain words as negative, the participants are just using certain words to describe specific features, yet do not have negative associations with these terms.

The role of Photovoice in highlighting watershed features and issues

Photovoice played several roles in expressing youth narratives including: (a) enabling local knowledge by youth; (b) identifying priority issues; and (c) identifying potential opportunities—areas, situations, dynamics—for improving watershed issues. We found our modified Photovoice procedure to be an effective tool in working with participants to identify which features in the watershed mattered and to explain why these features mattered to them. Using individual participant photo worksheets prevented particular students from dominating the discussion and reduced peer influence.

Since participants could select which photos to write about, the photographs expanded the narratives in an exploratory way led by the participant. Part of the success of Photovoice in learning from youth was the interactive, exploratory, open-ended nature of this approach that gave participants the freedom to explore and communicate what was significant within their own local watersheds. Seeing what was photographed and reading about why a certain photograph was selected was useful in understanding issues and places that were significant to the participants.

Within the context of watershed research and education, the visual component of Photovoice in terms of selectively taking photos of water and stormwater features in the built environment lends itself to two implications. The first is the potential to use Photovoice to identify locations of concern in terms of flooding, stormwater runoff, and sources of pollutants. This component has important related implications regarding stormwater management by addressing local watershed issues pertinent to neighborhood residents in contrast to the typical regulatory-driven approach. The second implication relates back to the themes derived from the photographs with the narratives. The role of Photovoice in driving the direction of the written narratives revealed the overlapping connections made by youth in both watersheds to connect the sense of responsibility and community to water elements and stormwater.

Challenges of using Photovoice

Several technological, attrition, and time-related challenges need to be considered in using Photovoice as a tool. We used disposable digital cameras. However, these digital cameras are too old-fashioned given that the youth in our study area had smartphone technology. Several of the participants found using the disposable cameras to be unwieldy or difficult to use given that they could not see the image prior to taking the picture. Numerous photos were excluded. The second and third challenges of this project were high attrition rates and time constraints. Several students were unable to make it to the second and final meeting. In the future, integrating Photovoice into the environmental science club curricula may prove to be more effective.

Conclusions

This modified Photovoice proved to be an extremely effective tool in exploring youth perspectives of their local environments and watersheds. Given the open inquiry nature of Photovoice as a methodology, we broadened and enriched our understandings of youth perspectives of their local watersheds and how they made connections between pollution, the need to take action, storm drainage systems, appreciation of the watershed, and the role of community approaches. We learned that despite the

differences in watershed and demographic characteristics, youth shared roughly similar levels of positive and negative experiences associated with each respective watershed. In the future, these photographs and narratives could be presented back to the community and exhibited. In the future, Photovoice could be used to further inquiry-based research regarding local environmental education.

Note

1. As per our university's Institutional Review Board regulations, the list of names with the identifying numbers was kept in a locked file to which only the one researcher had access. This was done to protect the confidentiality of the youth participants.

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