Editors:
Jaime Almansa Sánchez & Elena Papagiannopoulou

www.arqueologiapublica.es

AP:

Online Journal in Public Archaeology

AP: Online Journal in Public Archaeology is edited by JAS Arqueología S.L.U.

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PARTICIPATORY EVALUATION OF CULTURAL HERITAGE BASED PROGRAMMING TO EMPOWER COMMUNITIES:
A quantitative analysis

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Abstract

A survey conducted on Heritage Monitoring Scouts (HMS) programmes at six Florida regions examines participants' perceptions of public archaeology outreach initiatives on cultural heritage preservation. HMS Florida focuses on tracking changes to at-risk archaeological sites through public outreach programmes. A statistical analysis demonstrated a correlation between participants' perceptions and the effectiveness of certain elements that provide a substantial framework for reaching the public with the message of cultural preservation. The findings show that the Florida Public Archaeology Network is reaching its organisational goal of creating appreciation and awareness for heritage, which helps to sustain the mission and vision for those working in cultural preservation. These survey results will help other public archaeology outreach programmes impact cultural heritage initiatives focused on preserving the past, such as citizen science programmes.

Keywords

Citizen science**,** heritage monitoring**,** cultural heritage preservation**,** assessment**,** public archaeology, empowerment evaluation

Introduction

The Florida Public Archaeology Network (FPAN) was created in 2004 through the University of West Florida with three main goals: public outreach, assisting the local government to preserve and protect regional archaeological resources, and assisting the Division of Historical Resources in its archaeological responsibilities. Its mission statement is "to promote and facilitate the stewardship, public appreciation, and value of Florida's archaeological heritage." (Lees et al., 2015).

This largely takes place through community engagement—outreach programmes with the message of cultural heritage preservation—to the over 20 million residents of the state and the diverse transitory population on the importance of value heritage preservation (United States Census Bureau, 2016).

One such programme is Heritage Monitoring Scouts (HMS), a statewide outreach initiative that focuses on public engagement to track changes to at-risk archaeological sites. The goal of HMS is to advance heritage preservation through public awareness for Florida's archaeology, and to establish monitoring communities to document archaeological sites throughout the state.

FPAN's mission does not encompass traditional archaeological research, but does include the development of education materials with a consistent message of cultural heritage preservation that reaches Florida's diverse population. The creation of sustained appreciation and ultimately, protection of the state's buried past, the network believes, is best served by building relationships that take place around archaeologically-based activities.

While the numbers tell us what, where and how much we are doing, they do not provide information on whether our work is resulting in sustainable improvement on the metric outlined—albeit vaguely so—in our enabling legislation (Lees, Scott-Ireton, & Miller,

2015). Moreover, the assessment of these outreach programmes runs into some issues due to the size and diversity of Florida, with demographics varying dramatically along cultural and linguistic lines. Cultural heritage and the natural environment in these regions of Pensacola, Tallahassee, St Augustine, Crystal River, Tampa, Fort Myers, and Fort Lauderdale—where FPAN's offices are located— are also very unique and provide very different experiences and perspectives for programme participants.

As such, this study investigates the perceptions of participants in FPAN's cultural heritage outreach programmes to help gauge if individuals are being reached with the message of cultural preservation, and if this is having lasting effect on their behaviours. This will help FPAN design, market, and evaluate its future programmes to impact public perceptions on heritage preservation through networks of volunteers and documented data on historical sites.

Public archaeology evaluation

Public archaeology programmes provide information, education, motivation, and entertainment to the public. Programming is also a wonderful way to promote heritage preservation to the next generation. Many children and adults think of Indiana Jones when archaeology is mentioned. Programming provides hands-on experiences that allow programme participants to learn about the work archaeologists actually do on a day-to-day basis. The use of output measures helps identify performance and assess the outcomes of actions, which can be complicated by real-world problems (Van House, 1989). Evaluation and assessment of services and programmes is essential.

The effectiveness of public programmes has been challenged as budgets shrink. The effectiveness measures used by archaeological organisations suggest that a single, operational definition of effectiveness may not exist (Schalock, 2001). Instead, effectiveness is a "multidimensional" construct that applies to meeting organisational standards set for services (Van House, 1989).

Social programmes exist for the sole purpose of doing good for society. Some programmes are developed for improving social conditions or affecting social problems (Rossi, Lipsey, & Freeman, 2004). Most social programmes are extremely inhospitable environments for research, due to the delicate nature of delaminating behaviours such as addiction, difficult decisions evaluators are asked to make, compromises for real-world situations, and the adaptation of research methods to evolving situations and timelines. "The specific form and scope of an evaluation depend primarily on its purposes and audience, the nature of the programme being evaluated, and not least, the political and organisational context within which the evaluation is conducted" (Rossi et al., 2004).

The concept of evaluation

Evaluation informs actions, which involve decisions made based on information. The information drives planning, policy, changes to programmes, whether problems are worth pursuing, and values of professional practice. Many organisations make the mistake of implementing ritualistic evaluation procedures that lose meaning and provide little to no context. Often, evaluations are mandated and only utilised as a measure of compliance, with no intention of using the findings (Rossi et al., 2004).

Evaluations generally address five domains: programme development, programme design, implementation and service delivery, impact and outcomes, and efficiency (Rossi et al., 2004). All evaluations should be useful and used either directly or immediately to contribute to the organisational body of practical knowledge. Evaluation can help shape the general understanding of how to bring social change effects to fruition.

Assessments should occur over the entire duration of a programme. Defining outcomes at the beginning of the planning process can help services achieve set goals (Fiore, 2005). According to Rossi, Lipsey, and Freeman (2004), organisations should conduct pre- and post-evaluations so that the full impact of a programme can be understood. Evaluating at the end of a programme allows organisers to see the accomplishments of the current programme,

as well as begin planning the next (Fiore, 2005). "Outcomes measure the impact that services and programmes have on their target populations" (Gross, Mediavilla, & Walter, 2016).

Developing a perspective that goes beyond tests and incorporates competencies can help participants achieve more dimensions of success (Lu & Gordon, 2008). While benefits and achievements from programmes can differ greatly between individuals, programmes have traditionally been viewed in the context of assessment for learning and achievement. Embracing motivation as a key target for programming has been considered non-traditional (*ibid*.).

Public archaeology programming services aim at cooperating with schools, museums, environmental centres and other agencies to establish community relations focused on providing services and materials (Walter, 1992). Measuring these types of programmes can help provide an indication of how effectively the organisation is building community relationships. One important consideration for programming is the annual number of community contacts (Walter, 1992).

According to Kirkland and Carr (2010), due to the lack of formal education on archaeology, the public often misunderstands the science of archaeology and its goal. While a few public archaeology outreach programmes exist in the US, there is no concise or overarching programming standard for this type of education. Kirkland and Carr (2010) also state that currently, little to no data exist on the effectiveness of these public education programmes.

Public archaeology and community archaeology

While public archaeology provides public service through engagement in archaeological work (Simpson & Williams, 2008), it also encompasses the public values and ideas of the communities served. The terms 'community archaeology' and 'public archaeology' often are used synonymously due to the lack of conceptual definitions for either (Marshall, 2002). Community archaeology and public archaeology both refer to the public as those people outside the profession. While this definition is useful, the ideology that community archaeology is for the people by the

people is something of a fantasy (Simpson & Williams, 2008). "In reality, community archaeology is censored and manipulated, and communication of information and access to the past is controlled through many different agencies" (*ibid*.).

Community archaeology is made up of many motivations that exist within the sociopolitical context associated with the community (Marshall, 2002). Ultimately, addressing the question 'can community archaeology projects create, change, and even increase the value of the heritage outside the profession?' is essential for archaeologists (Simpson & Williams, 2008). The tangible and intangible values that it brings to communities must be evaluated so that notable success can be appraised, and ideally, replicated.

Community archaeology should be viewed from the key characteristics that allow public archaeology to be integrated into sociopolitical as well as economic environments. "It is certainly vital to deconstruct community archaeology, and understand the complex theories that motivate its application" (Simpson & Williams, 2008). Examining the relationship between value and approach helps provide a more concrete concept internally with the archaeologist and externally with the public.

Evaluating public archaeology outreach

The University of South Alabama and fourth graders from John Will Elementary School designed a new public archaeology programme with current Alabama Educational standards (Kirkland & Carr, 2010). The effectiveness of this programme was evaluated using pre-test and a post-test to gauge the retention of the students' knowledge of archaeology. The number of correct answers increased by more than 25 percent. Another unexpected outcome from this programme was that the fourth graders expressed interest and excitement for college, fostering aspirations to continue their education (Kirkland & Carr, 2010). This assessment method examined programme outcomes and how students' appreciation for archaeology was impacted.

Other public archaeology programmes have also utilised pre- and post-test surveys to evaluate effectiveness. It is still being

established if public archaeology programming provides value to the field. To date, however, there has been a lack of research into whether community archaeology projects are achieving the desired and perceived benefits of community dialogue and participation, and whether this translates into real effects on the public's knowledge and perceptions of the past, and subsequently their sense of identity (Simpson & Williams, 2008).

One important that has yet to be answered is whether community archaeology outputs have lasting impact beyond the duration of the project. This question leads researchers to address the issue of what their ideal expectations and achievement changes are for community values and identities due to public archaeology engagement. Besides more research, other methodologies are also needed. "Limited consideration has been given to qualitative and contextual approaches that allow archaeologists to evaluate the effectiveness of community archaeology projects" (Simpson & Williams, 2008).

A quantitative approach only paints a partial picture of the impact public archaeology has in the communities they serve. More members of the archaeological community believe that public archaeology is good for the field, but literature lacks descriptive evidence on how and to what extent public archaeology impacts individuals and communities. These issues are hard to address with quantitative measures.

Defining public archaeology has led to a philosophical move to relativism as an important component of theoretical archaeology in practice. This focus grew out of a sense of pride for community. "The future development of community archaeology will inevitably rely upon a balance between professional archaeological expertise and research agendas on the one hand, and answering the voices of communities themselves on the other" (Simpson & Williams, 2008). Community archaeology is headed towards projects that address proactive and reactive community values (Apaydin, 2016).

With discussions on community archaeology's outcomes to the public being affirmed, the alignment with public archaeology has been advocated. "The discipline should take a more self-reflexive and anthropological approach to the assessment of community

archaeology" (Simpson & Williams, 2008). This type of evaluation will provide sustainability and appropriateness for its future. For archaeology as a field to expand and overcome funding shortages, political agendas and other obstacles, the impact and value of community archaeology in public service must be measurable. Evaluations provide measurable evidence of programme effectiveness that both quantifies and qualifies the reach public archaeology has on individuals.

Public archaeology should have an established set of learning objectives or outcomes for evaluating programming. Often, archaeologists have no expectations when dealing with the public. "Even some archaeologists who work with the public by choice fail to take the endeavour seriously enough to develop a curriculum with objectives, outcomes, and assessment" (Skeats, McDavid, & Carman, 2012).

As public archaeology becomes more recognised in the field, archaeologists serving in educational settings will need training in learning theory and best practices for assessment. Evaluations in archaeology should be implemented in stages: frontend, middle (formative), and programme-end (summative). These types of evaluations function to address different issues. For example, formative evaluations are utilised for programme improvements, while summative are performed for end of the programme accountability. Front-end evaluations address needs in the audience or community.

There is a high level of diversity among types of public archaeology programmes, and there are many types of evaluations. "The use of different methods allows for the creation of comparable and complementary datasets" (Skeats et al., 2012). There is no single way to evaluate educational experiences in public archaeology programming. Collecting data at different stages of a programme allows for triangulation of several data sets. It is imperative that public archaeology programmes have a set of outcomes so that evaluations will have some measure of whether the programme is a success or failure (*Ibid*.).

This data collected in this evaluation of public archaeology outreach programmes supports the need for programmes that

focus on creating environments that are intrinsically motivating for participants. The three major elements to the self-determination theory (competence, autonomy, and relatedness) are all foundational components to FPAN's Heritage Monitoring Scouts programmes. The nature of these programmes allows participatory evaluation to help improve programming over time. The analysis of the data provides some key insight into what elements are important to impacting participants with the message of cultural heritage preservation.

Participatory evaluation

Participatory evaluation is a designed approach that engages participants in the process. The distinguishing characteristic of participatory evaluation is its reliance on non-evaluator stakeholders, which provides answers to pressing social questions. "Discussions thus shifted to benefits of involving stakeholders as a way of better supporting programme decision making, increasing the use of evaluation findings and including social justice perspectives that had been missing up to that point" (Chouinard & Cousins, 2012).

Participatory evaluation uses a three-stage approach to evaluation utilising listening, dialogue, and action. Ilse Brunner and Alba Guzman (1989) define participatory evaluation as "an educational process through which social groups produce action-oriented knowledge about their reality, clarify and articulate their norms and values, and reach a consensus about further action." None of the components of the approach or processes can be considered mutually exclusive. Participatory evaluation is a tool that empowers people. The inquiry gives a voice to those touched for the purposes of educating and affecting social change (Chouinard & Cousins, 2012).

Self-determination theory as a framework for creating programmes

Participatory evaluation focuses on the process rather than the goals. Under this perspective, "evaluation is systematic inquiry leading to judgements about programme merit, worth, and significance, and programme decision making" (Chouinard, &

Cousins, 2012). Judgement requires a comparison of gathered data. The basis for this comparison can be a standard of performance, performance of other programmes, or the performance of the programme in question over time.

Participation in programming is the reason the programme exists—without participants, there is no programme. Yet, approaches to evaluation negate the perspective of the participants. Many participants describe challenges in overcoming and in giving voice to the disenfranchised (McIntyre, 2008). Researchers are narrative interpreters that provide context through a dialogical process; a focus of understanding, listening, and interpreting allows the participant to help make meaning of the interactions. According to David Fetterman, Shakeh Kaftarian, and Abraham Wandersman (2015), this requires openness to what others have to say while understanding our own biases and prejudgments.

Empowerment evaluation strives for participants to foster and facilitate the evaluation process of knowledge discovery. "Empowerment evaluation is the use of evaluation concepts, techniques, and findings to foster improvement and self-determination" (*ibid*.). This type of participatory evaluation is imbedded in self-determination, and redefines the role of the professional's relationship with participants. Professionals see through the eyes of the participants, and their skills are not imposed but utilised as a resource. A key component of participatory evaluation is the collaborative dialogue that takes place with participants.

The evaluator cannot empower anyone; it is about participants empowering themselves. Empowerment evaluation is an invitation to participants to examine programming (Fetterman, Kaftarian, & Wandersman, 2006). Creating an environment that is conducive to meaningful participatory discourse can be difficult to establish. This type of evaluation process does not view knowledge as merely collected information, but rather as jointly constructed through social interaction (Chouinard & Cousins, 2012). Empowerment evaluation is an ongoing process where value assessments become part of the life cycle of the programme. This type of evaluation produces rich data that allows organisations to make complete external assessments of programmes.

Intrinsic motivation

Real-life activities are not always intrinsically motivating. Carol Sansone and Judith Harackiewicz (2000) suggest that intrinsic and extrinsic motivation may be related and work together to impact behaviour. Intrinsic motivation can be susceptible to challenge or failure. The theory of intrinsic motivation does not focus on its cause, but instead looks at the conditions that keep the individual engaged with the motivational activity (Ryan & Deci, 2000).

This can help demonstrate why some find volunteering so rewarding. The relationships between an individual's perceived competence and intrinsic motivation will create more intrinsically motivated desire for an activity. For this to happen, the activity must be challenging to the person; activities that are too easy are not expected to be intrinsically motivating, even if the person is extremely competent. Any activity that is intrinsically motivated is pleasurable within itself or as part of activities that are also pleasurable in the substantive sense (Sansone & Harackiewicz, 2000).

Edward Deci (1975) defines intrinsic motivation as the desire for self-determination and proficiency in an environment. Self-determination is a key to intrinsic motivation. Intrinsic motivation can be defined in terms of behaviour exhibited without external pressure to do so, even when alternatives are available. It is the conceptualisation of an individual's need for competence and self-determination (Deci & Ryan, 1985a). According to Sansone and Harackiewicz (2000), intrinsic motivation is the propensity of individuals to engage in activities that interest them, and to learn, develop, and expand their knowledge. Intrinsic motivation primarily focuses on how we learn and create enjoyment for that learning.

Some studies suggest that intrinsically motivated activity is grounded in the need for self-determination, because this—"freedom from control"–is essential for intrinsic motivation to function (Deci and Ryan, 1985a). The outcomes of intrinsic motivation reveal the values and regulatory processes that result in high-quality learning, conceptual understanding, personal growth, and adjustment to the environment (Deci, Vallerand, Pelletier, & Ryan, 2011). The theory has implications for public archaeology's ability to increase

involvement in cultural preservation activities. Understanding how intrinsic experiences create a desire to leave and expand knowledge is key to helping programme participants appreciate and become aware of the importance of cultural heritage preservation.

Methods

HMS is one of the newer FPAN programmes. It asks participants to help monitor archaeological sites, which involves uploading pictures taken at specific angles to a database. The Division of Historical Resources and land managers benefit from the documentation of these sites. While the overarching mission of the programme is to help document sites impacted by animals, humans, and the environment—specifically sea level rise—those tasked with heritage preservation also benefit from these volunteers doing the legwork. Changing participants' perceptions directly relates to programming facilitating a love for archaeology. Creating educational programmes that focus on meaningful learning correlates with this change of perception. These three components provide context for how FPAN can successfully reach their programme goals (it is also important to note that all archaeologists working for this organisation have at least a Master's-level education or are currently enrolled in such programmes).

HMS programming focuses on the incorporating the public into cultural preservation of archaeological sites in Florida. In 2017, case studies were undertaken in the Northwest, Northeast, Central and West Central regions of Florida, and two in South Florida. With the exception of one case study, the programmes saw participation from the general public. The demographic information from these surveys reveal that the majority of the participants were largely over 50. The West Central Florida case study had participants that worked in several of the local state and federal parks. These participants wanted to implement the programme to help monitor public lands containing significant archaeological sites.

This study examines if the programme changed participants' perception of archaeology and helped them to appreciate the field.

This will in turn help FPAN design, market, and evaluate future programmes, which will have an impact on public perceptions of heritage preservation in the state. A quantitative analysis utilising surveys was carried out addressing the following research question: What are programme participants' perceptions of public archaeology programmes?

The surveys, which took less than two minutes to complete, were self-administered. Short statements were presented to participants in which they were asked if they agreed or disagreed using a Likert-type scale and one open-ended question. The open-ended question was analysed for themes that were not found in other questions on participants' favourite part of the programme. Such surveys are an inexpensive way to collect data quickly right after the programme ends, while the experience is fresh in the participants' minds.

Quantitative statistical analysis

Questions with Likert-type responses produce categorical data. We can test the relationship between two categorical factors using a chi-squared test (Ott & Longnecker, 2016). In particular, we are interested in controllable factors of the programme. With evidence of this relationship, we can begin to investigate the most effective way to communicate the message of cultural heritage and how to preserve it.

Chi-squared is a common test and can be used in a variety of situations, although there are assumptions at play. In particular, we assume that the expected cell count is greater than five; this translates to having an adequate sample size in each response. When this assumption is broken, or we have a low response rate with particular categories, Fisher's exact test should be used. Fisher's exact test directly computes a p-value, rather than a test statistic (Agresti, 2007; Ott & Longnecker, 2016). We note that the Fisher's exact test is valid for all sample sizes, however, it is computationally intensive and computations take considerable time and resources, even when computing with a computer. Thus, when assumptions are met for the chi-squared, we should elect to employ it.

Another quantitative method used in this study is generalised linear modelling (GLM). This allows us to create a model that quantifies the relationship between two factors. We note that with the chi-squared or Fisher's exact, we can only determine that a relationship exists, however, we cannot quantify the relationship. By creating a GLM, we now are able to give direction and strength of the existing relationship. Further, when we have sufficient sample size, we can include other factors in a multivariable, or adjusted, model. Modelling is extremely versatile and can be used to determine the impact of any one factor on an outcome of interest.

In this study, we focus on binomial logistic regression, a type of GLM used to model a binary response, which has only two possible values. We note that linear regression using the normal distribution is not appropriate for binomial responses. When using linear regression, the resulting prediction equation allows for predictions less than 0 or greater than 1, which are not possible responses given the binary data. Thus, binary logistic regression is the method of choice for binary outcomes.

When analysing data, it is imperative that appropriate methods are employed to answer the research question and provide evidence for decision making. Dependence testing and modelling can be powerful tools for understanding large and complex sets of information. These methods can be done relatively quickly and easily. In this study, we looked at the HMS programmes' impact on the participants' appreciation and perceptions of archaeology. Further, we make an argument that these methods should be used more often to substantiate claims made by researchers in social sciences.

Data

In this study, 60 participants volunteered to filled out surveys after the HMS programming. Participants were informed about and completed activities related to recording archaeological site data. The questions regarding the content and the environment of programmes that are controllable were focused on for determining the motivations of the participants to invest in archaeology and their community. Numbers are associated with responses to keep

with best practices of SAS programming and 'no answer' responses were removed for analysis. With the coding scheme, we assume each response interval shown in Table 1 is equivalent.

Survey question titles	Possible answers
Explanation of title	Numerical value
Educational Did the participant find the programme educational?	Yes-1/ No-2/ No answer-3
Fun Did the participant find the programme fun?	Yes-1/ No-2/ No answer -3
Responsive Did the participant find the staff responsive?	Strongly disagree-1/ Disagree-2/ Nuetral-3/ Agree-4/ Strongly agree-5/ No answer-6
Perceptions Did the participant find the programme changed their perceptions of archaeology?	Strongly disagree-1/ Disagree-2/ Nuetral-3/ Agree-4/ Strongly agree-5/ No answer-6
Appreciation Did the participant find the programme enhanced their appreciation of archaeology?	Strongly disagree-1/ Disagree-2/ Nuetral-3/ Agree-4/ Strongly agree-5/ No answer-6
Use information Did the participant perceive themselves likely to use the information in the future?	Very unlikely-1/ Unlikely-2 / Nuetral-3/ Likely-4/ Very likely-5 / No answer-6
Recommend Would the participant recommend the workshop?	Yes-1/ No-2/ No answer-3

Table 1: Variables used for dependence testing

Chi-squared

A chi-squared test is used to determine the relationship between two categorical factors. However, it does not determine the strength of relationship, only that one exists. In the current study, the sample size is such that the chi-squared does not provide a reliable estimate. As such, we employed the Fisher's exact test. According to Aaron and John Hess (2017), the major limitations of the Fisher's exact test include computational intensity and traditional usage for small samples with 2 x 2 tables, however, computer analysis has made this test easier to apply to a variety of table sizes. Because our sample size is not large, there are no difficulties applying the test in this study.

To begin analysis, numerical values were assigned to the Likert–type scale survey responses. The surveys provide information about the degree to which participants agree or disagree with a statement. The results of Fisher's exact test on factors as related to the variable 'perceptions' are given in Table 2. The outcome, 'perceptions', examines if the participants' experienced a change in their view of archaeology due to being part in this programme. Factors with low p-values show a statistically significant relationship between the variable 'perceptions' and the factor of interest.

The level of significance, or p-value, of the Fisher's exact test is the weight of evidence suggesting that the two factors are dependent. The p-value gives the probability of an event equal to or greater than the event observed; a small p-value shows stronger evidence that there is a relationship present (Ott & Longnecker, 2016). In this study, $p<0.05$ is deemed statistically significant.

Factor	Frequency of response			p-value
	Strongly agree/ Yes/ Very likely	Agree/ Likely	Other/ No	
Educational	49	11	-	0.009
Fun	48	-	11	0.1272
Responsive	54	6	-	0.2671

Factor	Frequency of response			*p*-value
	Strongly agree/ Yes/ Very likely	Agree/ Likely	Other/ No	
Safe environment	55	5	-	0.7145
Appreciation	29	31	-	0.0008
Useful information	46	13	-	0.3705

Table 2: *p*-values showing dependence to the variable perceptions

Using binomial regression

After using Fisher's exact to determine which factors of the survey are dependent on the participant's perception of archaeology, regression models were constructed to quantify their impact on the dependent factor, or response. As mentioned previously, binomial logistic regression is used to model a binary response variable where only two possible values exist.

Because the answers 'strongly agree' and 'agree' are the most important responses regarding perceptions, the responses from 'agree' and 'strongly agree' will be combined into one response, titled, 'agree.' Similarly, another variable will be created for those responses that do not fall into the category 'agree,' titled 'do not agree.' This creates only two possible values for perceptions of archaeology: the participant either agreed, strongly or otherwise, with the workshop changing their perceptions of archaeology or the participant did not agree in any fashion, including 'neutral,' 'disagree,' or 'strongly disagree.' Variables that have a significant association with the variable Perception, taken from Table 2, were used as explanatory variables in the binomial logistic regression.

Educational	Appreciate	Perception	Frequency
Strongly agree	Strongly agree	Agree	27
		Do not agree	1
	Agree	Agree	14
		Do not agree	7
Agree	Strongly agree	Agree	1
		Do not agree	1
	Agree	Agree	3
		Do not agree	6
		Total	60

Table 3: A frequency table of participant responses

Using the model obtained by SAS software:

$$lllllllll(YY) = \mathrm{ee}{-0.9575+1.7607xx1+2.0659xx2}$$

The odds of an outcome are determined. The binary explanatory variables (xx_1 and xx_2) model the odds and probability based on whether a participant Strongly Agreed with the factors 'educational' ($xx_1 = 1$) and 'appreciation' ($xx_2 = 1$) or not ($xx_1 = 0$ and $xx_2 = 0$ respectively). The odds of an event are given by the model when the appropriate values for xx_1 and xx_2 are used. For example, if a participant responded 'strongly agree' to both factors, then $xx_1 = 1$ and $xx_2 = 1$ and the model would suggest that the participant's odds of answering 'agree' to the question regarding their changed perception are 18 times the odds of an answer of ''neutral', 'disagree', or 'strongly disagree'. In this example the odds ratio is roughly 18:1. Using the odds ratios we can interpret the likelihood of events based off the binary response variables.

After modelling the binary outcome, we can predict the probability of a participant selecting at least 'agree' on a survey, based on their response to the factors 'educational' and 'appreciation'. Each scenario, illustrated in Table 4, describes a different combination

of participant answers on the survey provided at the end of the programme. In addition, it shows the predicted probability that the scenario will result in an answer of at least 'agree' for the question regarding a changed perception of archaeology for the participant. As the factors increase in agreement, from 'agree' to 'strongly agree' the predicted probabilities increase as well.

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Appreciation	Strongly agree	Strongly agree	Agree	Agree
Educational	Strongly agree	Agree	Strongly agree	Agree
Predicted probability	0.946	0.752	0.691	0.277

Table 4: Modelled probabilities of a participant selecting at least 'agree'

Ethical consideration

The entire survey consisted of 13 questions. Those that addressed participants' programme content, demographic information, and marketing or development information were not included in this study. Survey methodology was used to provide a quantitative description of participants' perceptions of public archaeology programming.

The study consisted of six case studies in Florida. At each of the public archaeology programmes adults of different ages attended. All participants attending programmes during that day were solicited to participate in the study by announcing the study at the beginning of the programme. Participants are defined as adults over 18 who attend programming on the day that surveys were administered. Specific information on participants' education, zip code, age, and income was collected. In this study, participants were not assumed to have the same demographic information as the community in which the programme took place. All participants were from Florida, but some drove over an hour to participant in the programme.

Data was collected in each programme during a day when there were no holidays or special activities. The public archaeology staff leading the programme spoke to participants at the beginning of the programme about the survey. After the program, the researcher gave a short description of the consent form and survey. Participants who attended the programme were invited to participate in the survey, and immediately following the program, paper surveys were handed to participants who were willing to be a part of the survey. Participants took the survey either in the programme room or outside near the archaeological site visited as part of the programme.

Participants were informed that they did not have to take the survey, and there was no penalty for not participating. Also, participants could stop the survey at any time without penalty.

Finding implications

The quantitative results examined how participants perceive programming. Archaeology provides of evidence of our past. Public archaeology has a difficult task in making the past relevant and meaningful to individuals in the present. The goal of FPAN's programmes are to first and foremost help people appreciate archaeology and make them aware of cultural heritage. The results from this study provided data that the goals are being reached and they are being created by educational programmes lead through the efforts of FPAN's responsive staff.

What are programme participants' perceptions of public archaeology programmes?

Educational programming that provides meaningful context into cultural heritage requires highly skilled archaeologist that are responsive to the needs of the public. Programmes utilise activities and hands-on experiences with real archaeological sites. Quality educational programmes take time, money, and a high-level of expertise to create learning opportunities that are fun and meaningful. The programmes facilitate a feeling in participants

that they are helping archaeologist. Participants learn about how humans and nature are causing damage to archaeological sites. As participants go through the educational process of the programme they learn how they can make a difference in preserving cultural heritage in Florida.

The impact that many participants are experiencing is specific to the actual programme activity of documenting sites. Participants enjoy being part of heritage preservation and feeling like they are making a difference. Many retirees note that this programme helps to improve their condition or quality of life in during their retirement years. Land managers note that their condition is improved because they are given help in monitoring at risk sites that in some cases maybe lost in just a few months.

The programme survey data was analysed using binary logistic regression, a type of generalised linear modelling. The results show that the educational value of the programme and love for archaeology has a distinct impact of the participants change in perception about archaeology. Thus, if the programme can educate participants and help them love and appreciate archaeology, their perceptions and attitudes about archaeology and heritage will change. One key component to the FPAN's mission is helping the public to appreciate archaeology. Making programmes educational will help individuals to appreciate culture and heritage, and the change in attitude about cultural preservation is the ultimate goal for any programme that FPAN offers.

Using Fisher's exact test demonstrations that participants who experience perception change love and appreciate archaeology. This means that there is a correlation between the two variables. Participants who have a perception change about archaeology find the programme educational, the staff responsive, and the environment of the programme safe, supportive, and friendly. If we want to change participants' perceptions of archaeology such that they will appreciate and love archaeology, then programmes should have the following qualities: be educational, have a responsive staff, and have a safe, supportive, and friendly environment.

Conclusion

HMS programming has been successful in impacting the public with an awareness and appreciation for public archaeology. The autonomy, relatedness, and competence work to help promote intrinsic motivation in participants to keep engaging in the efforts to preserve archaeological sites across Florida. The relationship/engagement, activity, and information help to change perspectives on the public by creating appreciation and awareness of these valuable cultural resources that are being lost to climate change, development, and other issues. While this programme is not an original idea (learning from the Loss Project funded by the Scottish Universities Insight Institute), it is the first of its kind established in the US.

The citizen-science type programme helps the public make a difference for heritage preservation. The theory utilised in this programme evaluation was success in creating a framework for assessment. The success of these programmes stems for responsive, knowledgeable staff that create quality educational programmes for the public that allow autonomy and task accomplishment. The statistical analysis shows how the participants are moving across a spectrum of experiences created by a framework focused on autonomy, competence, and relatedness. These elements help to build a lasting impact measured through volunteer hours.

The volunteers demonstrate intrinsically motivated behaviours through monitoring and recruiting other volunteers. The community created by the HMS programme allow people with similar interest to support each other and build relationships around issues such as climate change and the need to preserve out cultural heritage. Most of the documentation the scouts collect are in the form of photos, notes, and artefacts. This information provides evidence to others on the important work individuals are doing to help preserve our heritage.

Acknowledgements

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