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Richard W. Harper[a], Emily S. Huff[b], David V. Bloniarz[a], Stephen DeStefano[a], Craig R. Nicolson[a] and Michael Davidsohn[c]

[a]Department of Environmental Conservation, University of Massachusetts, Amherst, MA, USA; [b]Department of Forestry, Michigan State University, East Lansing, MI, USA; [c]Department of Landscape Architecture and Regional Planning, University of Massachusetts, Amherst, MA, USA

ABSTRACT

To build deeper knowledge regarding urban forestry issues and familiarity with programming audiences, a multi-year needs-assessment was conducted by initiating qualitative stakeholder research interviews with professional urban foresters (i.e., tree wardens) and volunteer urban tree committee chairs. An objective of this exercise was to inform the implementation of relevant university-based continuing education (i.e., extension) opportunities, that led to the development of deliverables that included online urban forestry programming, the initiation of an urban tree committee census, and the development of a street tree selection guide. Findings indicate that qualitative stakeholder research interviews are a reliable needs assessment methodology and have widespread applicability among education professionals.

Introduction

For university-based continuing education (i.e., Extension) programming to be relevant, it must meet the needs of the target stakeholder audience. There are a range of ways to assess audience needs from informal conversations, to formal assessments. In recent years, University of Massachusetts Extension faculty and administration concluded that both professional and volunteer urban forestry stakeholder audiences required further engagement in the continuing education programme development process. To reliably inform these programming needs, the recently-appointed Extension faculty needed to acquire a deeper understanding and familiarity with urban forestry issues and audiences, using an approach that would be rigorous, yet not overly technical and unfamiliar to audience members. A review of the literature revealed that continuing education stakeholder audiences prefer face-to-face interaction with a single university Extension professional (Kelsey & Mariger, 2002). This was further confirmed in participatory discussions with key faculty, agency specialists, and select members of Massachusetts' urban forestry constituency.

A number of qualitative research approaches (Dodd & Abdalla, 2004; Elmendorf & Luloff, 2001) were explored and it was decided that our research approach would

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employ qualitative research interviews (Diehl et al., 2017; Elmendorf & Luloff, 2006), with both tree wardens and volunteer urban tree committee chairs. It was believed that this approach would:

(i)   Foster two-way communication and build rapport (Creswell, 2007, p. 123) between university-based urban forestry Extension personnel and key off-campus urban forestry audiences;

(ii) Facilitate the building of knowledge of critical urban forestry issues in Massachusetts (i.e., assess need);

(iii) Inform the creation of relevant urban forestry Extension programming opportunities.

Denzin & Lincoln (2005) define qualitative researchers as individuals that:

" … study things in their natural settings, attempting to make sense of, or to interpret, phenomena in terms of the meanings people bring to them." (p. 3)

Creswell (2007, pp. 53–75) identifies five accepted qualitative research approaches:

(1) Narrative Study – focused on a single individual.

(2) Phenomenological Research – the meaning or experiences of several individuals relative to a concept or phenomenon.

(3) Grounded Theory – the generation of an explanation (a theory) of process, action or interaction of typically larger numbers of individuals.

(4) Case Study – the study of an issue through the examination of one or more cases.

(5) Ethnography – the study of cultures or people groups (i.e., teachers, social workers); strives to answer how a culture or group "works".

Within each of these approaches, a variety of accepted qualitative data collection methods can be employed including participant observation, documentary analysis, narrative analysis, and in-depth qualitative research interviews (Rubin & Rubin, 2012). Research interview methodologies may range from being scripted with standardised questions and subject-areas, to being flexible, open-ended and in-depth (Fontana & Frey, 2005). Between the extreme of the structured interview and the unstructured interview, is the semi-structured interview, that according to Brinkmann and Kvale (2015), obtains highly detailed and descriptive data via a sequence of themes and suggested questions, along with probing questions for follow up.

Here we detail our specific approach of employing qualitative semi-structured stakeholder research interviews with Massachusetts tree wardens and volunteer urban tree committee chairs as a means of fostering audience familiarity, acquiring a deeper understanding of urban forestry issues (i.e., assessing need), and reliably informing university continuing education programming. Additionally, we outline key impressions experienced by the interviewer and generalise conclusions applicable to other education professionals who may wish to also employ qualitative stakeholder research interviews.

Methods

Interviews with tree wardens

From the autumn of 2013 through the spring of 2016, fifty qualitative research interviews were conducted with active Massachusetts tree wardens (Harper, Bloniarz, DeStefano, & Nicolson, 2017) in their professional (i.e., naturalistic) setting (Lincoln & Guba, 1985). This was done with the aid of an eight-question interview instrument (see Table 1) that had been constructed with input from academic and agency urban forestry specialists, and pre-tested (Dampier, Harper, Schwartzberg, & Lemelin, 2015).

Interview candidates were selected based on the following criteria:

(a) They could provide expert knowledge regarding the functions and responsibilities associated with the position of tree warden,
(b) They could provide expert input concerning the management of urban trees in Massachusetts,

Interviews ranged from 15 to 30 minutes. If the tree warden was not available in-person, the interview was conducted over the telephone. Community visitations typically involved a post-interview tour of the municipality and its parks, green spaces, and select urban trees. To obtain a representative sample, tree wardens were selected in a stratified, purposive manner from urbanised centres, as well as rural communities in both the eastern and western regions of the Commonwealth (see Table 2).

Interviews with chairs of volunteer urban tree committees

During the spring of 2017 a twenty-one-question interview instrument (see Table 3) was constructed with input from academic and agency urban forestry specialists (Harper, Huff, Bloniarz, DeStefano, & Nicolson, 2018). During the summer of 2017, telephone interviews with 13 Chairs representing 13 distinct urban forest tree committees across Massachusetts were conducted (see Table 4), ranging in duration from 15 to 30 minutes.

Interview candidates were selected based on the following criteria:

(a) Participants could provide general information regarding their urban forest tree committee in Massachusetts,

Table 1. Interview questions with MA tree wardens.

Interview Questions
(1) What best describes the position of Tree warden in your community and how long have you occupied this position?
(2) Highlight the essential resources (staff, technical equipment, etc.) you have to help you do your job?
(3) What sort of groups (i.e., organisations, municipal departments) do you interact with regarding community tree-related issues?
(4) Are you currently monitoring for pest-related problems?
(5) What are three educational/training needs?
(6) How could this information best be disseminated to you?
(7) What time of the year is training or programmatic information best made available?
(8) Would you be willing to share any of your local success stories with others?

Table 2. Tree wardens from the following Massachusetts municipalities participated in semi-structured, naturalistic interviews.

Central-Western MA		Eastern MA	
Municipality	Population	Municipality	Population
Worcester	183,016	Cambridge	109,694
Springfield	153,991	Fall River	88,712
Chicopee	55,300	Newton	88,287
Amherst	37,819	Brookline	58,732
South Hadley	17,514	Plymouth	58,271
Greenfield	17,456	Medford	57,437
Belchertown	14,649	Barnstable	45,193
Athol	11,584	Everett	44,231
Sturbridge	9,268	Chelsea	38,861
Lenox	5,025	Watertown	34,127
Cheshire	3,235	Andover	33,201
Stockbridge	1,947	Natick	32,786
Ashfield	1,737	Needham	28,888
Granville	1,521	North Andover	28,352
Whately	1,496	Wellesley	27,982
Pelham	1,321	Walpole	24,070
Chester	1,308	Wilmington	22,325
Petersham	1,234	Acton	21,929
Goshen	1,054	Sandwich	20,675
–	–	Newburyport	17,926
–	–	Duxbury	15,059
–	–	Dennis	14,207
–	–	East Bridgewater	13,794
–	–	Bedford	13,320
–	–	Lynnfield	11,596
–	–	Wrentham	10,955
–	–	Dighton	7,086
–	–	Orleans	5,890
–	–	Rochester	5,232
–	–	Avon	4,356
–	–	Plympton	2,820

(b) They could offer in-depth, first-hand knowledge regarding the operations and functions of their respective urban forest tree committee,

(c) They could provide information about the variety of ways in which their urban forest tree committee would interact with local residents and community stakeholders.

Based on local agency data (Massachusetts Department of Conservation and Recreation, unpublished) and a further searching of listed contacts and municipal websites, it was broadly estimated that there are no less than forty active, volunteer urban tree committees in Massachusetts.

In both interview scenarios, the total number of interviews conducted was determined by the point at which no new analytical insights were forthcoming (Ritchie & Lewis, 2003, p. 336). It was determined that these requirements were satisfied after obtaining interviews with fifty tree wardens and thirteen urban tree committee volunteers. All interview candidates were purposively selected (Dampier et al., 2015; Lemelin, Dampier, Harper, Balika, & Bowles, 2017). Data generated from these interviews were imported into the Computer-Assisted Qualitative Data Analysis Software (CAQDAS) NVivo 11 (2015; QSR International, Melbourne, AUS), and participant responses to questions were coded (Saldana, 2013) to generate a thematic framework. A theme

Table 3. Interview questions with MA urban tree committees.

Interview Questions
(1) Briefly tell us about your local TC and your involvement
(2) Briefly outline your background and your motivations for participating on your local TC
(3) When was the TC formed?
(4) Does your TC have a charter?
(5) Does your TC have a mission?
(6) Is the TC advisory only, or is there an authority (regulatory) component?
(7) Please outline the number of members on your TC and the typical term length?
(8) How is an individual ratified (formalised) as a TC member?
(9) When does your TC meet?
(10) How are meetings run and how are they evaluated?
(11) What sort of operational guidance (i.e., annual plan of work, budget) does your TC have?
(12) Briefly identify key programmes or initiatives your TC carries out?
(13) Briefly identify some key collaborating groups – why have these partnerships been successful?
(14) Briefly identify some examples of some unsuccessful collaborations. Why?
(15) Is there a means of evaluating a programme's or an initiative's success?
(16) How does your TC interact with the public (i.e., Facebook page, town meetings, etc.)
(17) Identify the steps taken by your TC to maintain volunteers & recruit new participants?
(18) Briefly describe the nature of your TC's interaction with the local Tree warden
(19) Briefly describe the nature of your TC's interaction with local municipal officials (i.e., mayor's office, select board, councillors)
(20) Briefly describe the nature of your TC's interaction with local (municipal) agencies, organisations and/or associations?
(21) Has your TC helped to develop, shape or implement policy in your community – how?

Table 4. Semi-structured interviews were conducted with urban forest tree committee representatives from the following MA communities.

Municipality	Population
Fall River	88,712
Brookline	58,732
Arlington	42,844
Chelsea	38,861
Amherst	37,819
Saugus	26,628
Greenfield	17,456
Newburyport	17,450
Lynnfield	11,596
Great Barrington	7,104
Mattapoisett	6,045
Marion	4,907
Lanesborough	3,091

was considered legitimately emergent upon its occurrence on three (n = 3) different occasions (Berg & Lune, 2012). To ensure consistency, codes were checked with collaborating authors. All interviews were conducted by the first author, a university Extension faculty member.

Results

Interviews with tree wardens

A substantive number of the fifty tree wardens reported that their position was located in the "department of public works (DPW)" (n = 26) or "highway department"

(n = 8). They also indicated that their position was often associated with terms like "director" (n = 13) or "superintendent" (n = 11). Tree wardens indicated that the resources available to carry out their duties included individuals that comprise a "tree crew" (n = 28), a variety of water, dump, bucket and pickup "trucks" (n = 22), and "chipper(s)" (n = 21). Organisations that tree wardens interact with on a regular basis included "municipal departments"(DPW; highway; water; parks) (n = 29), "shade tree committees" (n = 13), "commissions" (historical; cemetery; open-space) (n = 13), "conservation groups" (n = 9), and "garden clubs" (n = 6). Tree wardens indicated that they routinely monitored for urban tree pests like Asian longhorned beetle ("ALB", n = 31), emerald ash borer ("EAB", n = 29), "winter moth" (n = 15), "gypsy moth" (n = 6), and Dutch elm disease ("DED", n = 4). Training and educational needs for tree wardens included subject-matter related to "safety" (n = 13) such as "electrical hazard awareness" (i.e., EHAP, n = 3) and "hazard or risk trees" (n = 3). Other topics tree wardens identified as requiring further education about included urban forest "pests" (n = 12), urban forest "inventories" (n = 4), and urban "tree planting" (n = 4). Desirable educational delivery mechanisms included "in-person" (n = 31) programmes or meetings, "electronic" media (n = 27), and "web-based" (n = 19) methodologies. Tree wardens indicated that "winter" (n = 15) and "summer" (n = 14) were the most popular times to engage in professional development activities, compared with other less popular times of the year (i.e., spring, autumn).

Interviews with urban tree committee volunteer chairs

Introductory questions (1–8, see Table 3) with urban tree committee volunteers were designed to acquaint the interviewer with the individual and their respective community. Interviewees identified their committee "position" (n = 10) and discussed their "duration" (n = 6) as well as points about local "history" (n = 8) and tree committee origin. Interviewees indicated that they served in response to a deep "personal interest in trees and greening" (n = 10). Individuals also identified themselves as professionals (n = 5) in related "horticulture", "forestry", "naturalist", "landscape architecture/design", or "planning" sectors. The "origin" (n = 13) of the local tree committees spanned ranges from less than 10 years (n = 4) up to 30 years' (n = 3). Nearly all of the 13 tree committees (n = 10) represented in the interviews featured a "charter" and "mission statement" and indicated they worked in an "advisory, educational" (n = 11) capacity with municipal staff on urban forest issues. Typical committee membership size ranged from '4-6' (n = 3) to '7-9' (n = 3) individuals, who are most likely serving a "3-year" (n = 6) term limit. Successful candidacy for an urban forest tree committee in Massachusetts may be a multi-step process potentially involving a "personal invitation" (n = 3), a screening "interview" (n = 3), a completed "application" (n = 4), participation in an "initial meeting" (n = 3) and final placement onto the urban tree committee through an "election" (n = 5) by committee members and/or formal "appointment" (n = 9) by the municipality.

Operational interview questions (9–12, see Table 3) related to the mechanical aspects of a functioning urban tree committee. Interviewees identified that meetings were often "monthly" (n = 10), may be run by a "chair" (n = 3), almost always follow an "agenda" (n = 12) and document meeting "minutes" (n = 11). A substantive number of interviewees indicated "yes" (n = 5) their urban tree committee has a municipal budget,

though nearly just as many indicated "no" (n = 4) they did not. Interview data also indicated that urban forest tree committees may have some form of a "plan of work" (n = 4) guiding their activities. Urban forest tree committees might carry out a number of initiatives including "Arbor Day" (n = 6) activities. They may also be engaged in assisting with a local "urban forest inventory" (n = 3), "urban tree planting" (n = 7), and/or some form of direct "outreach, education" (n = 6) like staffing an "events booth, display" (n = 3), or generating "printed media" (n = 3) for handout.

The final segment of the interview (questions 13–21, see Table 3) related to understanding the urban tree committees and their community relationships. Interview data indicated that there were a variety of critical collaborators including municipal "DPW" (n = 6), and various "town committees, commissions" (n = 6) that included the "conservation commission" (n = 3) and "town planning board-committee" (n = 3). A variety of NGO's (n = 8) were identified as important collaborators including local "garden clubs" (n = 3) and "environmental groups" (n = 3). Many urban tree committee representatives indicated that "no" (n = 6) they did not perform a formal programme evaluation as part of standard programme follow-up. Public interaction took place through "in-person interaction" (n = 7) at a "table or booth" (n = 3) display. Some urban tree committees employed some form of "electronic recruiting" (n = 4) that included "email" (n = 2), "Facebook" (n = 1), and a "website" (n = 1) to attract volunteers. Interviewees felt there was an ongoing "need for volunteers" (n = 4) and that some committees strove to "foster camaraderie & interest" (n = 5) to maintain current volunteer capacity. Urban tree committees reported that they generally had a "positive relationship" (n = 7) with their community tree warden and that there was "regular communication" (n = 6) between the two parties. Interviewees typically described the relationship with local officials as being "positive" (n = 10) and indicated that there was "regular interaction" (n = 7) with their community decision makers. Local agencies and organisations of importance that were identified included local "municipal departments" (n = 7), "committees, commissions, administration" (n = 4), and "NGOs" (n = 5). Among these emerged the "planning department-board" (n = 4), as well as references to parks and recreation, the department of public works and other garden clubs. Urban forest tree committees indicated "yes" they are often actively involved (n = 8) in policy development related to "local tree by-laws" (n = 4) and "local tree ordinances" (n = 4).

Discussion

The university educator as the interviewer

Research interviewing is a distinctive method of qualitative data collection that incorporates technique and skill, aimed at generating knowledge through the context of social practice (Brinkmann & Kvale, 2015). In contrast with other methodologies – like mail-based surveys (Rines, Kane, Kittredge, Ryan, & Butler, 2011; Rines, Kane, Ryan, & Kittredge, 2010) – this approach permits the researcher and the interviewee to directly investigate and discover matters with varying considerations and complexities. It facilitates an information exchange that produces data that is deeply contextualised, and that may convey a rich depth of story (H.J. Rubin & Rubin, 2012).

In this instance, the qualitative stakeholder research interviews conducted by the university Extension faculty member provided an important experience and opportunity. The role of educator was exchanged for that of a "neutral collector of information" (Morton, 2002) whose primary function was to collect information (i.e., data) from stakeholders. The interaction, documentation, and analysis built knowledge related to the practice of urban forestry in Massachusetts from both urban forestry professional (i.e., tree wardens) and volunteer (i.e., urban tree committee chairs) viewpoints. It also fostered learning related to the practice of planning, conducting, and formally documenting social science research that could reliably inform future continuing education programming initiatives.

Tree wardens in Massachusetts

Massachusetts tree wardens are generally housed in a municipal department (highway or public works), often in a senior management capacity. To successfully utilise urban forest resources to manage public shade trees, tree wardens typically interact with local municipal departments, commissions, and citizen volunteer groups. Tree wardens expressed the desire to receive continuing education, both in-person and web-based, preferably in the summer or winter months. Training content might include information pertaining to urban forest pest management, safety, tree inventories and urban tree planting. Tree wardens overwhelmingly indicated that they routinely monitored for urban forest pests.

Urban tree committee volunteers in Massachusetts

Urban forest tree committee volunteers in Massachusetts are typically passionate, committed individuals who care deeply about urban trees and their proper management. To ensure viability in this sector of volunteerism, committee members could be equipped with resources related to the use of social media, as well as strategies to engage and broaden the base of individuals potentially willing to serve on their urban forest tree committee. Successful urban tree committee volunteers require the capacity to work constructively and cooperatively with a wide number of stakeholders, decision makers and audience members, with special attention being given to the community tree warden – a position pivotal to the success of urban forest management at the local level in Massachusetts.

Conclusions

Recommendations

In response to qualitative feedback from Massachusetts tree wardens, University of Massachusetts Extension faculty developed the monthly noonhour "Urban Forestry Today" continuing education webcast series. The hundreds of urban foresters and arborists that tune-in to these monthly hour-long broadcasts, view presentations from university researchers and other professionals who discuss the latest science and practice on a variety of urban forestry-related topics, at no cost. They are also eligible to obtain continuing education credit for each hour-long session. The Western Chapter of the Massachusetts Tree Wardens was founded so that tree wardens in more rural areas

of the state could attend regular, in-person programming. This scenario facilitates face-to-face networking, as well as the opportunity to obtain continuing educational credit from a variety of guest-lecturers. Finally, as a result of interviewer feedback, a street tree selection guide (McElhinney & Harper, 2019), was developed to aid tree wardens and arborists with the appropriate selection of urban trees under potential future climate change scenarios.

In accordance with results from interviews with urban tree committee volunteers, a census was initiated to identify and update urban tree committee presence, membership, and activity across the 351 communities of Massachusetts. The creation of an urban tree committee volunteer handbook is also planned, to assist communities with the development and operation of a local urban tree committee. Consideration is also being given to the formation of an urban tree committee association so communities may share resources, exchange information, and develop peer-to-peer volunteer mentorship programmes.

Summary

This qualitative research exercise both increased the visibility of University of Massachusetts Extension throughout the Commonwealth of Massachusetts and helped to foster camaraderie between university Extension faculty and urban forest stakeholders. To address emergent and critical issues, Extension professionals must understand and align programming audience needs with appropriate information delivery methods (Conner, Dev, & Krause, 2018). As with many audiences in other disciplines, the dynamic state of urban forestry in Massachusetts necessitates ongoing interaction with tree wardens and urban tree committee volunteers to maintain communication and facilitate familiarity, and to routinely assess educational needs and Extension programming priorities (Elmendorf & Luloff, 2001). Though qualitative interviews are time-intensive, the organised and systematic manner that this research approach demands, provides a much higher likelihood of generating reliable data, compared to informal stakeholder interaction. Other needs assessment approaches – such as mail-based surveys – often suffer from low response rates and do not provide the rich detail that an interview yields. Qualitative stakeholder research interviews are a reliable needs assessment methodology and have widespread applicability among education professionals that desire to effectively reach audiences with continuing education programming.

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Disclosure statement

No potential conflict of interest was reported by the authors

Notes on contributors

Richard W. Harper, PhD., is an extension associate professor of Urban and Community Forestry in the Department of Environmental Conservation, University of Massachusetts Amherst. He teaches courses and administers an applied integrated research and extension programme in urban forestry.

Emily S. Huff, PhD., is an assistant professor in the Department of Forestry at Michigan State University. She is interested in the effect of humans on natural resources availability and quality. Her research uses self-reported and observational data on human behaviour, specifically on attitudes, values, preferences and intentions that may (or may not) lead to behaviour. Her stakeholders and subjects range from private landowners, to natural resource managers, to the general public. Her work focuses most on forested systems, both rural and urban.

David V. Bloniarz, PhD., is a faculty member in the Department of Environmental Conservation at the University of Massachusetts Amherst. His primary work involves technology transfer and research initiatives related to urban natural resource structure, function and value. He works on the development of new tools and technologies that can be utilised by planners, managers and researchers, which are the primary areas of focus of the work undertaken by the Urban Natural Resources Institute (UNRI), where he serves as its project director.

Stephen DeStefano, PhD., is an adjunct research professor in the Department of Environmental Conservation, University of Massachusetts Amherst, and was the leader (1999-2019) of the U.S. Geological Survey's Massachusetts Cooperative Fish and Wildlife Research Unit. He has worked on a variety of wildlife species and topics related to population dynamics, habitat relationships and wildlife–human interactions, with a focus on the influence of anthropogenic factors (development, disturbance) on wildlife and landscape conservation.

Craig R. Nicolson, PhD., is a lecturer in the Department of Environmental Conservation, University of Massachusetts Amherst. He studies the sustainability of ecological-social systems, addressing questions relating to how ecosystems change through time, and how people interact with natural resources. He predominantly works in two domains: sustainable urban systems, and water resource management, in collaboration with teams of scientists and stakeholders to develop holistic understandings of complex system dynamics.

Michael Davidsohn is the director of the Stockbridge Landscape Contracting Programme and a senior lecturer II in the Department of Landscape Architecture and Regional Planning at the University of Massachusetts Amherst. He teaches courses in landscape contracting including landscape design, surveying, construction materials and business management

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