Title
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The Challenges in Training Energy Efficiency Program Evaluators

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ABSTRACT

The energy efficiency services sector is an increasingly important part of the global economy, with an increased need for trained evaluators to foster energy efficiency program accountability and improvement. Organizations are experiencing difficulty in finding people who are knowledgeable about and experienced in the evaluation of energy efficiency programs. Accordingly, there is a need to assess the training needs of the energy efficiency evaluation community (for both new and "experienced" evaluators). This paper presents the results of a recent survey conducted by the International Energy Program Evaluation Conference (IEPEC) on energy efficiency evaluation training needs, and contrasts those findings with findings from a survey conducted by the American Evaluation Association on young evaluators (those people in the field less than 5 years).

Introduction

The energy efficiency services sector (EESS) is poised to become an increasingly important part of the U.S. economy (Goldman et al. 2010). For example, in one analysis of a "high growth scenario," the EESS may grow to 1.3 million individuals, a four-fold increase in jobs between 2008 and 2020; and in the "low growth scenario," a two-fold increase in jobs may occur (*ibid*). At the same time, the field of energy efficiency program evaluation has grown in prominence, due to an array of factors, such as increased regulatory requirements and review, the use of energy demand forecasts and bids by independent system operators, and the crediting of energy efficiency in air quality programs and carbon-trading markets. With the increased activity in the energy efficiency arena and the need for trained evaluators, organizations are increasingly experiencing difficulty in finding people who are knowledgeable about and experienced in the evaluation of energy efficiency programs[1]. Accordingly, there is a need to assess the training needs of the energy efficiency evaluation community (for both new and "experienced" evaluators).

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[1] This statement is not based on a scientific survey or analysis, but on informal discussions with experts and practitioners in the field of energy efficiency evaluation (Khawaja 2012; Rosenberg 2012; Violette 2012). In fact, this problem seems to be more challenging for the evaluation community than the rest of the energy efficiency industry: after the regulated energy efficiency industry as a whole declined from 1995-2005, people with evaluation skills migrated out of the field and none came in to replace them (Rosenberg 2012). As a result, most consulting firms specializing in the evaluation of energy efficiency programs are hiring young, smart, enthusiastic, and inexperienced staff and conducting their own in-house evaluation training (Cooney 2012; Peters 2012; Violette 2012; White 2012).

This paper presents the results of a recent survey conducted by the International Energy Program Evaluation Conference (IEPEC) on energy efficiency evaluation training needs. The IEPEC is a non-profit, educational corporation that organizes conferences on the evaluation of energy efficiency programs every two years in the United States - and now annually when including the conferences held outside the U.S. (Vine et al. 2010). IEPEC offers workshops and training the day prior to the conference on topics ranging from introductory statistics, to planning and managing evaluations, and to measuring greenhouse gas emissions. While other organizations have offered multi-day trainings (separate from conferences) and workshops associated with their conferences (e.g., Association of Energy Services Professionals and the Electric Power Research Institute), the IEPEC remains a principal source of practitioner exposure to energy program research. The educational elements of the conferences go beyond formal workshops to include peer-sharing, refereed papers, poster sessions, expert panel discussions, and the all-important informal networking. The Educational Subcommittee of the IEPEC recognized the need to assess the training needs of the energy efficiency evaluation community (not evaluation broadly or energy efficiency broadly), and conducted an energy efficiency evaluation training survey in 2011.

IEPEC Survey

In 2011, the IEPEC sent an online survey[2] to its database, which IEPEC considered to be the best, readily available database targeted toward the survey's prime audiences.[3] The survey included mostly close-ended questions targeted to help IEPEC direct training efforts in the field of energy efficiency program evaluation. The survey was sent to 5,300 e-mail addresses around the world that the IEPEC had collected over the years – of this number, 785 opened their email and 211 answered the survey (~28% response rate), but many key questions, such as course preferences, generated answers from fewer than 50 respondents, since many were not interested in evaluation training at the time of the survey (see below). In addition, some responses for specific questions were low due to skip patterns in the survey.

This sample was a self-selected group of people. However, this list included more than people who had attended an IEPEC conference. The list also included names from other organizations, suggestions from evaluators, etc. And the list went beyond "evaluators" as it included regulators, program administrators, etc. As noted in footnote #2, we feel that the survey was targeted to the right group of people. Furthermore, the goal of the survey effort was to provide general scoping information and to serve as the first step in the research process. We realized that the survey had limitations, but we were not prepared to spend a much larger budget to hire a consultant to conduct a more robust survey effort. Accordingly, we can draw conclusions from those involved with energy efficiency programs, but not the wider evaluation community.

The survey respondents were associated with many types of organizations, but consulting firms proved the most common (almost 29%) (Figure 1). The second largest category was
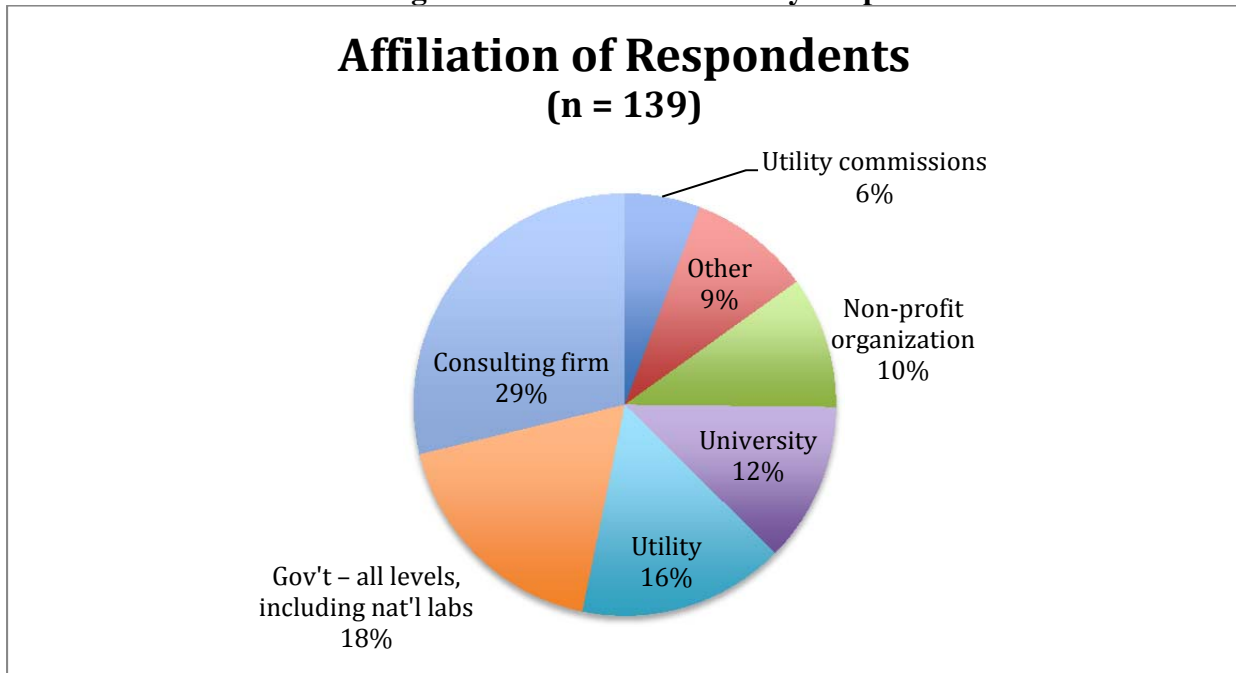
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[2] The online method was chosen due to its lower cost (compared to mail or phone), the format of the database (already formatted for email; phone numbers and postal mail addresses were lacking for most people on the list), and because all of the people on this list had access to the internet.

[3] Potential candidates for the proposed training would generally be limited to those involved with energy efficiency programs, so that is why the survey was sent to IEPEC email addresses. Evaluators in the education field, for example, would likely have limited interest in studying energy billing analysis techniques.

government (about 18%), followed by utility companies (16%) and four other affiliations each representing 12 percent or less. The diversity of the affiliations highlights a challenge to meeting the training needs of the evaluation community. A consulting firm implementing energy program evaluation may, for example, have a strong interest in obtaining training for new employees in survey design techniques and statistical analysis. On the other hand, regulators, policy makers, and utility managers may have an interest in training to further a basic understanding of evaluation results; effective management of evaluation-related consultant contracts; and enhanced skills for communicating evaluation results to the public.

The diversity of evaluation approaches, needs and expertise for many evaluation activities introduces an additional challenge. Evaluation of energy efficiency programs requires knowledge and expertise in multiple overlapping areas including evaluation approaches, statistics, energy engineering, econometric modeling and sociology, to name a few. As a result, energy evaluation professionals come from a wide variety of disciplines, and while they may be an expert in one area, they may have knowledge gaps in another. Many of these experts may also have little or no exposure to energy programs, the energy industry, or basic energy terminology.

Figure 1. Affiliations of Survey Respondents

Affiliation of Respondents
(n = 139)

Utility commissions 6%
Other 9%
Non-profit organization 10%
Consulting firm 29%
University 12%
Utility 16%
Gov't – all levels, including nat'l labs 18%

The majority of the respondents had attended two IEPEC conferences or less. And in terms of evaluation experience (as reflected in the metric, "years in energy program evaluation"), evaluation experience took on a barbell shape with most respondents falling in the 0-3 year range or the 10 years+ category. This does not reflect the number of evaluations worked on per year or the size of their firm's energy evaluation practice. And we expected most experienced evaluators to be less interested in training than those newer to this field.

About 62 percent (130 responses) were interested in energy program evaluation training now for themselves or for their staff, while the remaining were not interested in training "at this time." More than one-half of respondents interested in training agreed with statements identifying the lack of evaluation training opportunities, costs and travel as barriers. Agreement

with the lack of training opportunities as a barrier was highest and was higher (statistically significant at the 95% level) than costs (Figure 2). It is important to note that if training was provided within their country, more people would be able to obtain training from senior management, since it is easier to get approval within one's country, compared to obtaining approval for out-of-country training, and the costs are lower (there was a statistical difference at the 90% level between cost and travel). As discussed later in this paper, the travel barrier is probably an important motivation for seeking other opportunities for obtaining training. This barrier may have been further aggravated by a generally weak economy in the United States and in many parts of the world. Frequently, public and private organizations curtail expenditures in discretionary areas such as non-essential travel.

Figure 2. Barriers to Training
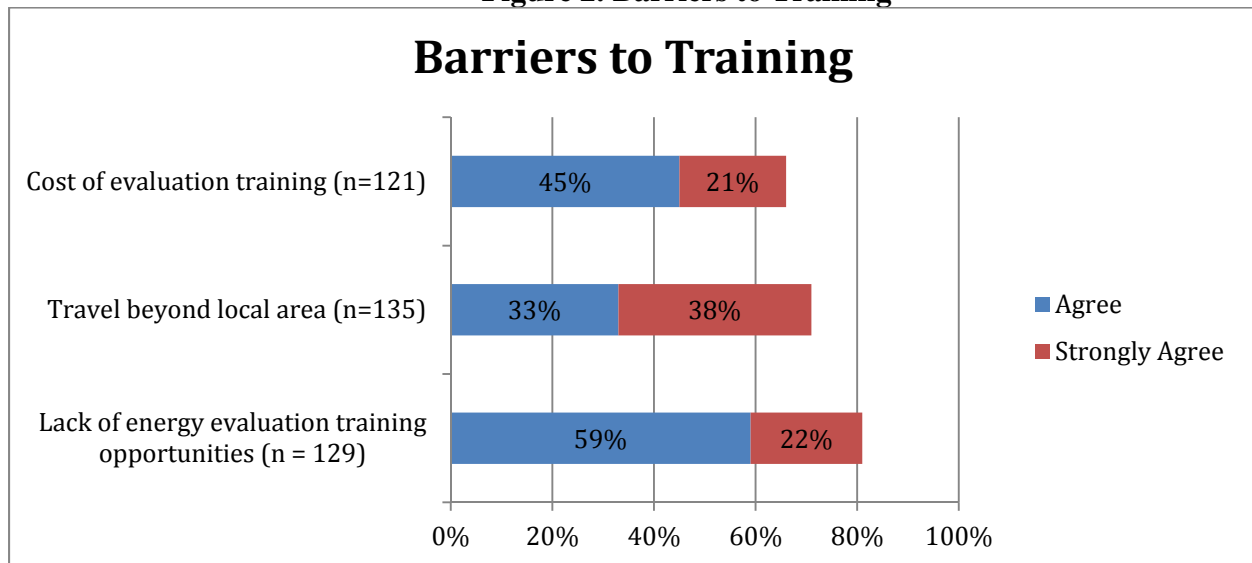
Respondents indicated the preferred course level for possible evaluation courses (beginner, intermediate, advanced). They were also asked about potential evaluation topics to be taught: impact evaluation, process evaluation, market evaluation, survey data collection, monitoring and verification (M&V) on-site analysis and metering, market assessment and statistics for evaluators.[4] For respondents interested in training for themselves, the level of interest in all the major course topics (e.g., process, impact) was roughly equal (Figure 3). Also, there was strong interest in all three levels of evaluation courses (i.e., beginner, intermediate, advanced).

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[4] These topics were a subset of a longer list of evaluation topics that the IEPEC Education Subcommittee chose to be on the survey.

**Figure 3. Interest in Training Options for Self**
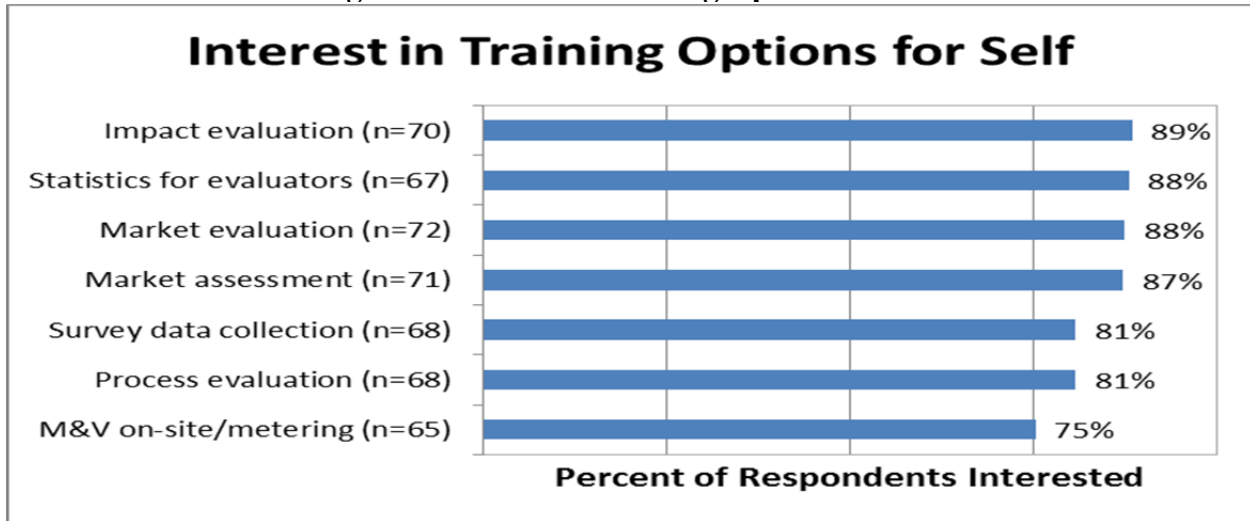
A closer look at the results shows some distinctions among the course types. For impact evaluation, there was a preference for the beginning and intermediate levels, but for M&V metering, the intermediate's level was the clear choice (Figure 4). Clearly, there was relatively little interest in advanced courses, although those interested in market assessment and process evaluation had a greater interest in such advanced courses (compared to other courses).

**Figure 4. Preferred Course Level for Respondent**
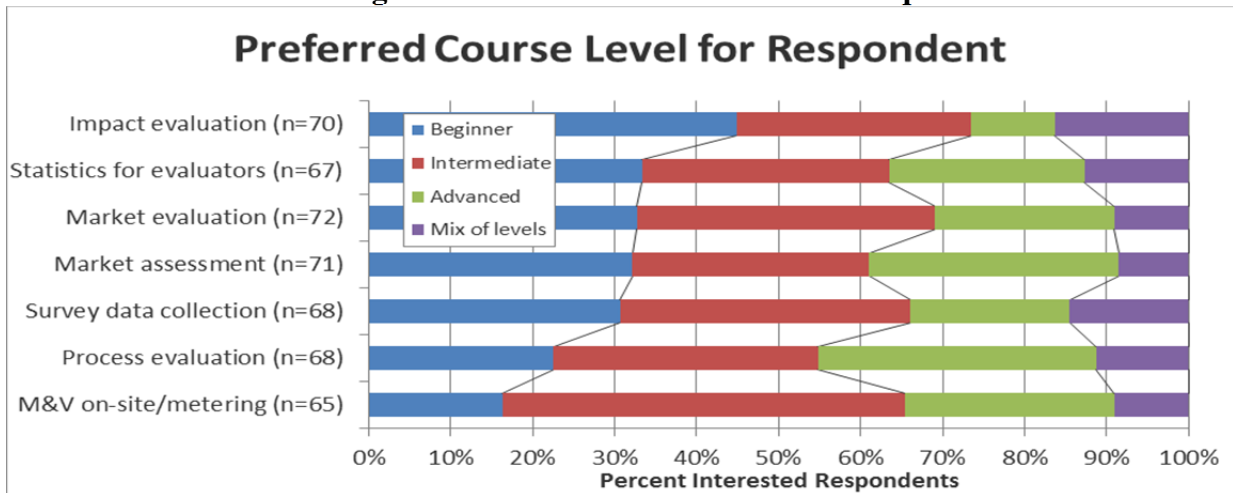
Respondents were asked about the type of evaluation training venue that *they preferred*: as part of the IEPEC conference, a webinar or online presentation, in-person training at various locations, or video course. By a wide margin, webinar/on-line was the preferred venue for providing training with in-person training a distant second (Figure 5). Including training as part of the IEPEC was the least popular option. This may well reflect the barriers mentioned above, particularly the cost of training and the difficulties in traveling beyond the local area.

Figure 5. Preferred Course Location
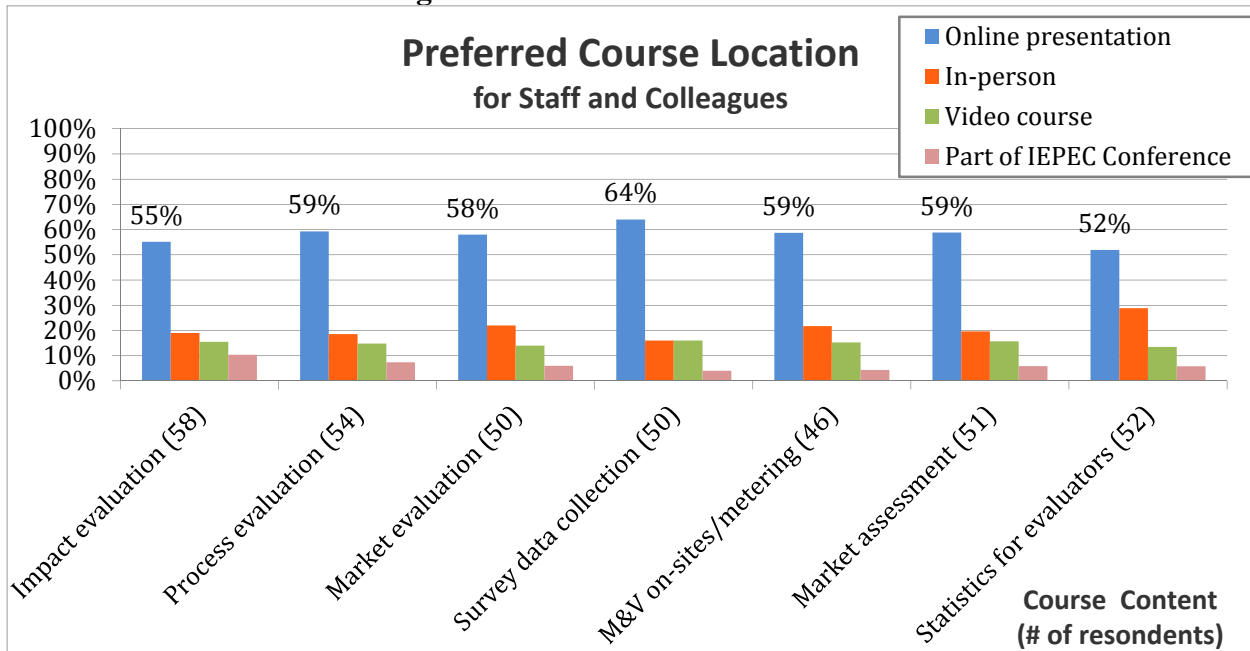
When the respondents were addressing the *training needs of their colleagues and staff within their company*, all the major course topics (e.g., process, impact) generated interest, with impact evaluation generating the most interest and M&V metering, the least (Figure 6).

Figure 6. Preferred Course Level for Evaluation Topics for Colleagues and Staff
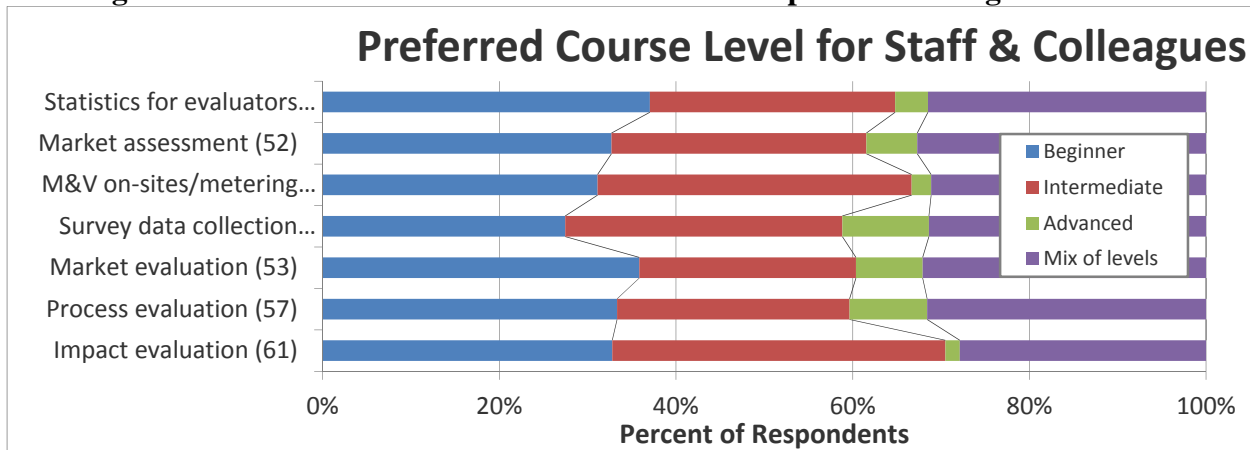
There was a strong preference for beginner and intermediate level courses. Again, by a wide margin, webinar/on-line was the preferred venue with in-person training a distant second for their colleagues and staff (Figure 7). One respondent noted a need for video courses about more advanced evaluation topics, since most training that was accessible to this respondent was on basic evaluation ideas. For this person, cost was a barrier because the respondent would have to travel, mostly out of country, to take advantage of in-person training. Thus, the respondent would like to see more on-line courses with a robust content.

Figure 7. Preferred Course Location for Evaluation Topics for Colleagues and Staff
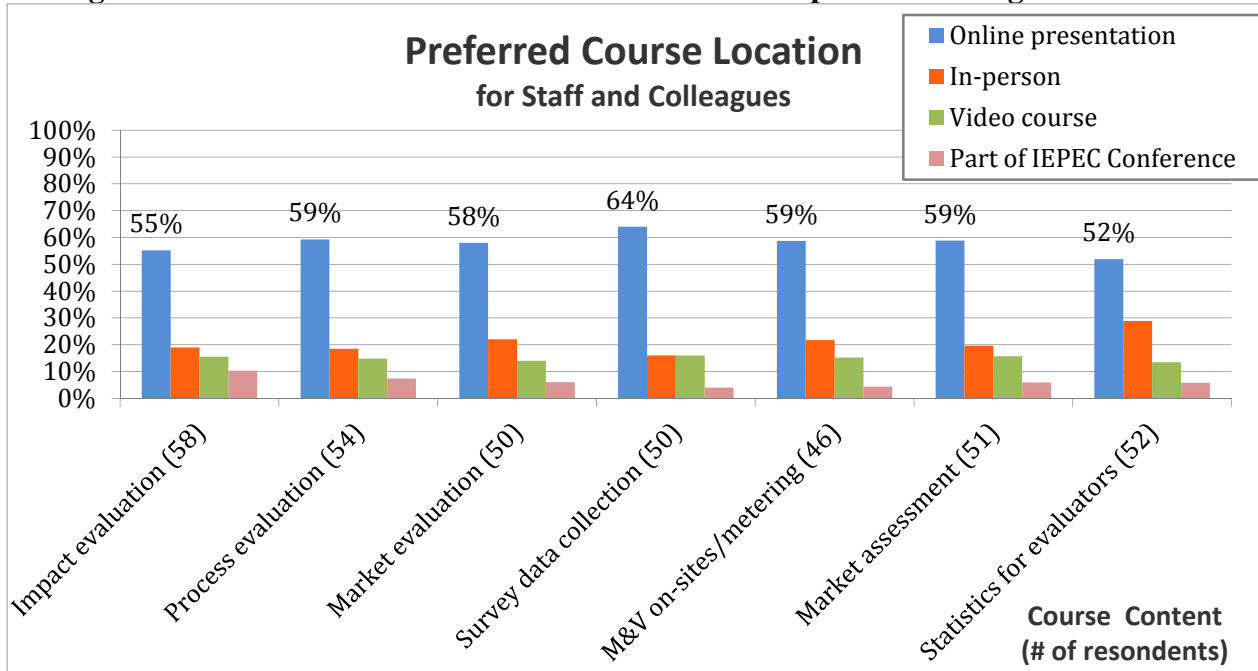
Speaking for themselves and colleagues/staff within their company, respondents were asked about their interest in each of the more focused course topics related to evaluation practices and regulatory policies, and evaluation methods. (Table 1):

**Table 1. Interest in Specific Course Topics**

Topic	Count	Percent (N=211)
Evaluation and Regulatory Practices		
1. Best practices in evaluation	60	28
2. Developing an evaluation plan for one program	56	26
3. Communicating evaluation results to stakeholders	55	26
4. Developing a strategic plan for evaluating multiple programs	52	25
5. Evaluation and regulatory policy	50	24
6. Pros and cons of deemed EM&V databases	48	23
7. Analyzing evaluation data on regional or national basis	47	22
8. Selecting and managing an evaluation contractor	45	21
9. Developing a RFP for a program evaluation	44	21
Evaluation Methods		
1. Use of logic models	49	23
2. Billing analysis	49	23
3. Use of non-parametric tests	42	20
4. Developing a deemed EM&V database	41	19
5. Applications of geographic information systems	41	19
6. Use of logit models	41	19
7. Developing a technical reference manual	40	19
8. Verifying and certifying greenhouse gas emissions from energy-efficiency projects	39	18
9. Developing fixed effects models	38	18

For courses related to evaluation and regulatory practices, the lowest rated was developing a RFP for a program evaluation with 44 (21%) votes, and the most popular course was on best practices in evaluation with 60 (28%) votes – not a large difference. For courses related to evaluation methods, the counts were somewhat lower than the first set of courses: the lowest rated was "developing fixed effects models" with 38 (18%) votes, and the two most popular courses, logic models and billing analysis, receiving 49 (23%) votes – again, not a large difference. In summary, while the topics are quite diverse, there was interest in all of these topics, so that training in evaluation should not be limited to one or two subject areas.

The survey explored less traditional forms of communication (e.g., social media, video-sharing (such as YouTube), a blog), and respondents indicated the least interest in social media (such as Facebook and Twitter) and more interest in YouTube and blogs (Figure 8).[5] Since there are few evaluation training offerings via distance-learning, this represents an important opportunity for the evaluation community. Despite years of rave reviews for IEPEC, interest in having the conference every year in the US was also mixed.

Figure 8. Interest in Program Evaluation Activities
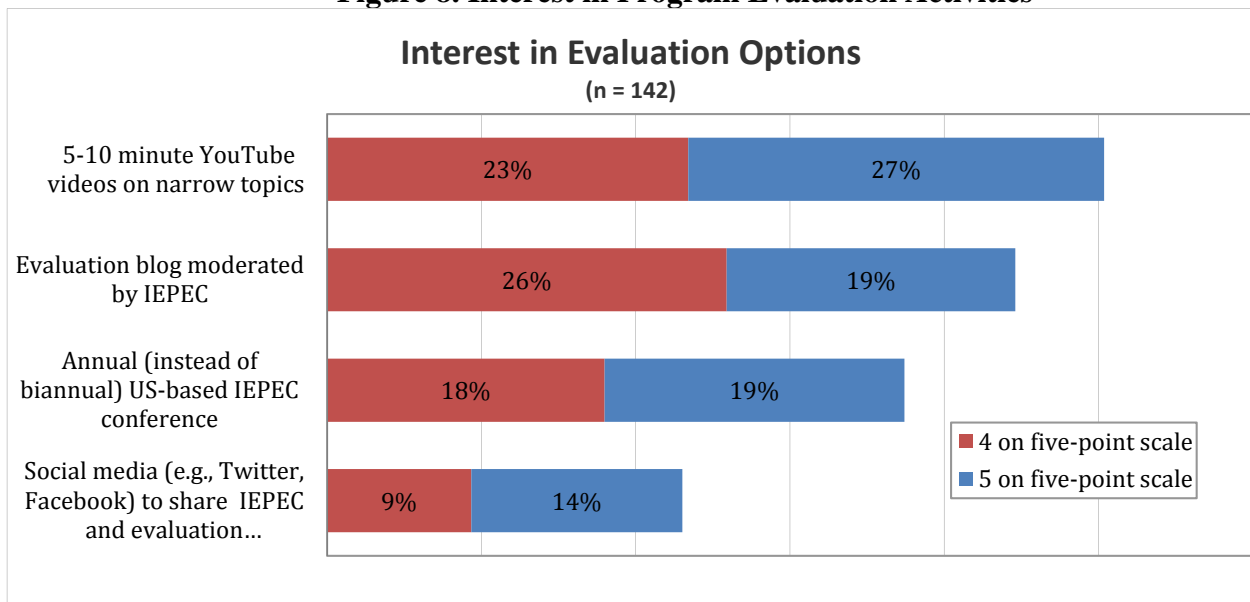
AEA Survey

In a survey sponsored by the American Evaluation Association (AEA)[6] in 2010, young evaluators (those people in the field less than 5 years and from all disciplines) were invited to share what matters to them, theoretically, conceptually and practically, as they began their professional lives as evaluators (Mathison 2011). From this call, the AEA received 139 proposals, and they found that young evaluators wanted to talk about their evaluation practice, to explore the ideas that they encounter in their education, and to contribute to the evolving discipline of evaluation. The most frequent focus of the proposals were issues in evaluating

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[5] One respondent suggested http://homeenergypros.lbl.gov as a social site to add evaluation threads and blogs.
[6] The AEA is an international professional association of evaluators devoted to the application and exploration of program evaluation, personnel evaluation, technology, and many other forms of evaluation. For more information, go to www.eval.org

particular evaluands (i.e., the subject of an evaluation – e.g., youth programs, professional development, international programs, and so on); elaborations or examples of using evaluation models (e.g., culturally responsive evaluation, evaluation capacity building, etc.); and descriptions of good teaching and learning of evaluation. Other topics included evaluation methods and techniques, evaluators' roles, evaluation use, evaluation influence, conceptual ideas in evaluation, evaluation within organizational contexts (including internal evaluation), how evaluation can benefit from other disciplines, the use of technology in evaluation and the evaluation of technology, and topics in research on evaluation.

As noted above, while there was some overlap with IEPEC's evaluation training survey, there were several categories that highlighted some important concerns by young evaluators that were not present in the IEPEC survey. These concerns were later reflected in the following questions by a young evaluator when trying to choose an evaluation method from the "candy store" of methods where "*everything* looks good, all feature common, enticing ingredients, yet the flavors are distinctly different" (Robinson 2011):

- How much do methods matter and, ultimately, do I choose them or do they choose me based on the evaluation questions and plan?
- Should I choose an approach that is participatory, democratic, utilization-focused, empowering, collaborative, real-world, responsive, goal-driven, or goal-free?
- What if my approach is determined by the information needs of the client and the nature of the evaluation questions?
- Is it truly incumbent upon *me* to *choose* an approach, or does the approach emerge from the developing evaluation itself?

The author notes that, "for the novice, there exists a most unfortunate degree of tacit knowledge in evaluation, some perspicacity that escapes my grasp, and an overall dearth of understanding of evaluation in practice." She concludes her article by quoting Michael Quinn Patton: "There is no one best way to conduct evaluation" (Patton 2010).

But should we be comforted by Patton's words? Should we strive to do more in offering guidance and evaluation training? Or should we leave it to the person who learns evaluation on the job? In 2006, IEPEC and the Association of Energy Services Professionals (AESP) conducted an online survey of energy evaluation and market research professionals to characterize the energy evaluation and market research profession (Bensch et al. 2006). The evaluators noted that most of them learned their trade (evaluation) on the job – either they took an evaluation job (38%) or evaluation was a component of their non-evaluation job (29%). For others, evaluation was a topic in their academic field (9%) or they studied evaluation as an academic field (9%).

While on-the-job experience will remain critical for adding new people to the field of evaluation, training on the *ethics* of conducting evaluations may not be available via "on the job training." The AEA has led the way in promoting this type of training. I 2004, they published the *Guiding Principles for Evaluators* (AEA 2004) to promote and guide ethical practice in evaluation, and they have developed a training package organized around these principles for beginning level evaluators. The Guiding Principles focus on five principles:

1. Systematic Inquiry: Evaluators conduct systematic, data-based inquiries.
2. Competence: Evaluators provide competent performance to stakeholders.

3. Integrity/Honesty: Evaluators display honesty and integrity in their own behavior, and attempt to ensure the honesty and integrity of the entire evaluation process.
4. Respect for People: Evaluators respect the security, dignity and self-worth of respondents, program participants, clients, and other evaluation stakeholders.
5. Responsibilities for General and Public Welfare: Evaluators articulate and take into account the diversity of general and public interests and values that may be related to the evaluation.[7]

For international audiences, it is important to note that the Guiding Principles were developed in a western cultural context, particularly that of the United States. As such, the principles and materials reflect the values and approaches of evaluators in the United States. Since evaluation training cannot simply be moved from the U.S. context into a foreign context, different cultural perspectives on evaluation itself, as well as on training, necessitate different training components and approaches. This is particularly important for countries where there is no systematic evaluation training and, as noted by one respondent, where there is not much room for open and independent evaluation.

Conclusions

The findings from the above research indicate that the training of evaluators (both new and experienced) is a high priority for a significant segment of the evaluation community. While there is a clear need to develop an array of evaluation opportunities (via workshops, webinars, videos, etc.) for educating evaluators on a variety of evaluation topics related to evaluation methods and services and evaluation methods, most respondents were interested in webinars and YouTube videos on specific topics in responding to the barriers to training. The training will also need to serve a wide range of interests including regulators, policy makers and evaluation practitioners. However, a great deal of the training will come on the job, and there will be a need for more types of general guidance and principles in educating the new evaluation workforce in the energy efficiency arena.

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[7] The last principle is one that is closely followed by energy program evaluators, as they are often required to be responsive to various guidelines and requirements of policy makers and regulators for conducting evaluations.

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