

Assessment of the Evaluation Competencies Needed for Extension Professionals at the University of Connecticut: Implications for Designing Professional Development Curriculum in Program Evaluation

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Abstract

Needs assessments serve a pivotal role in identifying the diverse competency needs of adult learners, particularly in the Cooperative Extension System (CES). While previous studies have found that an evaluation competency gap exists among Extension professionals (EPs), little is known about how to prioritize and sequence evaluation competency needs when designing curricula in program evaluation. This study aimed to assess the competency needs of a sample of EPs from the University of Connecticut and to identify and prioritize gaps in their program evaluation competencies. Data was collected through an online survey on self-perceived (a) abilities and (b) the importance of those abilities. The Ranked Discrepancy model (RDM) was employed to identify and prioritize competencies. Findings confirmed an evaluation competency gap across all assessed areas among EPs, consistent with those of earlier research. This study extended previous research by employing the RDM to prioritize and sequence competencies, representing one of the first applications of this approach to assessing evaluation competency needs within the context of CES. To support curriculum design, competencies were organized based on their Ranked Discrepancy scores, then structured into six groups, and sequenced in an order that aligned with specific phases and tasks of the evaluation process. This strategy offers practical guidance for instructional designers of curricula, particularly in selecting and organizing content, for in-service professional development initiatives. This study further provides a strategy for designing a program evaluation curriculum tailored to the CES context.

Introduction

Program evaluation is an intentional and structured process for generating evidence about the design, implementation, outcomes, and impact of an intervention (Organization for Economic Cooperation and Development [OECD], 2010, 2022). Within the Cooperative Extension System (CES), program evaluation efforts are crucial for identifying opportunities to enhance programs and to inform decision-making of key stakeholders (Duttweiler, 2008). Furthermore, evaluation in CES plays a pivotal role in communicating the public value of its initiatives (Chazdon & Paine, 2014), highlighting their contributions to the public good alongside the private benefits to their program participants (Franz, 2011, 2013, 2015; Kalambokidis, 2004, 2011). As such, program evaluation is a core task of the CES work.

EPs play a pivotal role in contributing to and engaging in evaluation efforts (Franz & Archibald, 2018), thereby helping to communicate the value of the CES. When a gap in evaluation competencies exists among EPs, this workforce is at risk of failing to support evaluation efforts effectively. One identified solution to address this gap is to offer in-service professional development as a component of evaluation capacity-building (ECB) interventions (Preskill & Boyle, 2008; Taylor-Powell & Boyd, 2008). According to Preskill and Boyle (2008), evaluation capacity building (ECB) interventions involve intentional

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organizational efforts to develop the capacity to engage in, conduct, and utilize evaluation at both the individual and system levels, thereby developing in-house evaluation capacity. The ECB's efforts have evolved and expanded into initiatives to build individual, group, and organizational capacity for doing and conducting program evaluation (Labin et al., 2012). ECB models are not limited to developing knowledge and skills but also aim to change attitudes (Preskill & Boyle, 2008). ECB strategies may include various components, such as the assessment of the evaluation competency needs at the planning phase (Ghimire & Martin, 2011; Norton et al., 2016), and offering in-service professional development, technical assistance and instructional resources, as well as creating an organizational environment conducive to building an evaluation culture, among others (Norton et al., 2016; Taylor-Powell & Boyd, 2008). Additionally, a synthesis of the ECB literature by Labin et al. (2012) identified that the most frequently used strategies are training, technical assistance, and experiential learning, with training being the most employed. Although several studies have provided ECB models with a professional capacity component in program evaluation, the specific content of the evaluation curriculum remains unclear. Additionally, developing one customized to the needs of EPs remains a challenge. Without a needs assessment (NA), the design of the evaluation curriculum may be of limited value to EPs, as it may default to a one-size-fits-all strategy that fails to account for their competency needs and learning priorities.

Although several studies have investigated competency gaps using NA approaches, most focus solely on identifying the gaps, with few examining their priorities. In the CES, a similar methodological gap exists, making it particularly important to identify competency priorities using NA approaches, especially since time for in-service training may be limited, due to the demanding job responsibilities (Russell et al., 2019). Additionally, previous studies have employed quantitative approaches for NA, such as the Borich model, which generates ordinal data and analyzes it using the mean. However, the appropriateness of calculating means from ordinal data has been subject to debate (Boone & Boone, 2012; Carifio & Perla, 2008; Norman, 2010; Sullivan & Artino Jr., 2013). Concerns about the appropriateness of calculating means from ordinal data underscore the need for further research in NA employing novel alternative approaches, such as the Ranked Discrepancy Model (RDM) by Narine and Harder (2021), which offers a solution to this methodological issue.

Conceptual Framework

Adult learners have diverse needs that warrant consideration when designing and facilitating educational content (Knox, 1974; Knowles, 1978). A key distinction in adult education, according to Knowles (1984), is that curriculum design should be informed by the learners' experiences, so that it is shaped by what the learners bring to the learning experience, as well as their perceived needs. In alignment with these principles, research on ECB best practices highlights the importance of identifying the competency needs of the target audience through a NA (Norton et al., 2016; Preskill & Boyle, 2008).

NA is a crucial step in designing interventions that consider the target audience's needs. NA informs about needs and guides the definition of their priorities (English & Kaufman, 1975; Witkin & Altschuld, 1995). Needs are the gaps between the current and desired results or states (Kaufman et al., 1993). In the context of instruction, NAs provide information to inform curriculum development (English & Kaufman, 1975). Importantly, NA helps ensure that interventions are relevant to the target audience's context. The responsiveness of a program to meet the needs of its target audiences is a key aspect to be evaluated (Watkins & Kavale, 2014). For evaluating an intervention, the OECD relevance evaluation criterion refers to the assessment of the alignment between the needs and priorities of the target audience and the goals of the intervention and its implementation (i.e., the quality of the intervention design) (OECD, 2021). Notably, this criterion emphasizes that the information produced by NA is fundamental to designing relevant interventions.

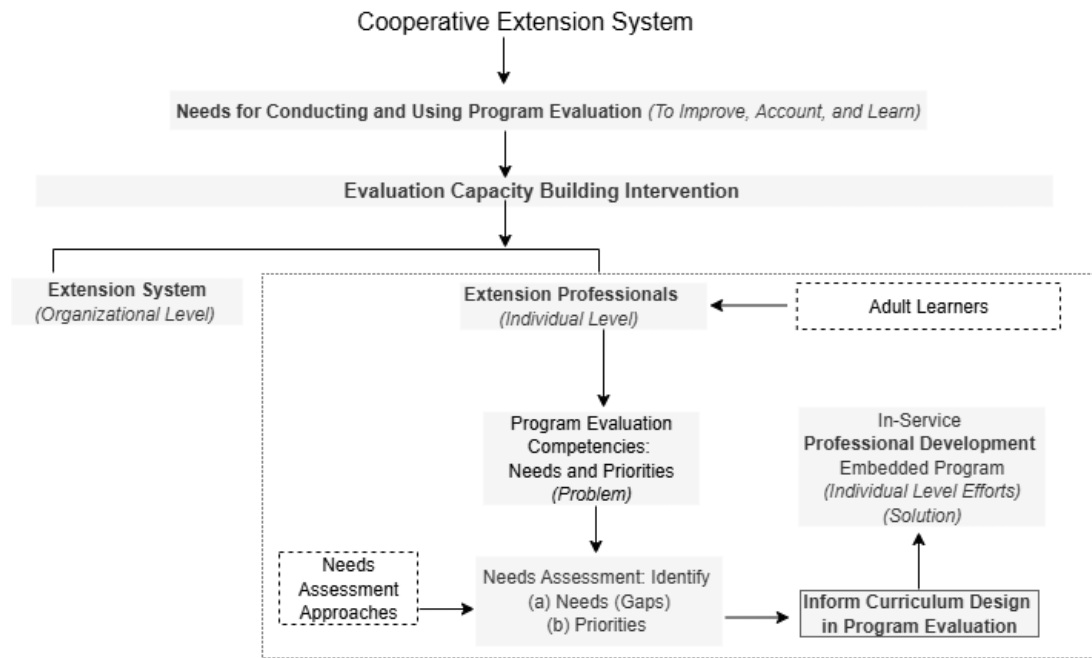
What approaches are relevant for conducting a NA? The research literature suggests various qualitative and quantitative approaches. Among the quantitative options, Choi and Park (2024) highlighted four core approaches informing the design of learning interventions through NA: the Borich model, the RDM, the Delta N method, and the weighted total index approach. Narine and Harder (2021) introduced the RDM as an alternative to the Borich model, as they stated. Unlike the Borich model, which relies on mean scores, the RDM analyzes frequency distributions and generates standardized scores. For these authors, the RDM overcomes key methodological concerns by avoiding the use of means with ordinal data.

Why is it relevant to engage in NA of evaluation competencies? The effective role of EPs requires showcasing the value of programming through evidence-based evaluation, making evaluation competency a core professional requirement. Several authors (Cooper & Graham, 2001; Diaz et al., 2020; Dromgoole, 2007; Ghimire & Martin, 2011; Harder et al., 2010; Rodgers et al., 2012) have described key competencies needed to conduct Extension work effectively and highlighted evaluation competency as a core one. However, EPs are primarily recruited for their subject matter expertise (Chaudhary et al., 2020),-and they may enter their roles without possessing the required skill set in program evaluation (Lamm et al., 2020).

This practice creates a misalignment between the competencies these workforce members bring to their role and those required to perform it effectively. Norton et al. (2016) noted that the limited competencies of EPs in program development and evaluation are common at the time of hire. In-service professional development training can help address this gap (Diaz et al., 2020; Narine & Ali, 2020; Labin et al., 2012), and NA results are central to informing the development of such efforts, thereby ensuring the relevance of their design. A key aspect in designing professional development interventions for adult learners is to offer a relevant curriculum that meets their needs. The relevance of curriculum lies in its fundamental role in organizing the teaching and learning process (Stabback, 2016). This relevance applies not only in formal education but also to informal settings, such as professional development for adults. Figure 1 illustrates the conceptual framework, which includes the key concepts and their relationships that provide structure to this study.

Figure 1

Conceptual Framework: Needs Assessment of Evaluation Competencies for Designing Professional Development Curriculum



Purpose and Research Objectives

The purpose of this study was to assess and prioritize the evaluation competency needs of EPs from the University of Connecticut (UConn), using the RDM as a methodological alternative to the Borich model. Specifically, this study addressed two research questions: (1) What are the evaluation competency needs among EPs at UConn? (2) How can the results of an evaluation competency NA based on the RDM inform the content and sequencing of the evaluation curriculum for the professional development training? The findings aim to offer practical guidance for conducting NAs that generate actionable data for informing curriculum design in the CES context, and to contribute empirical evidence by ranking evaluation competency needs among EPs using RDM scores.

Methodology

This cross-sectional study employed a descriptive survey design and the RDM (Narine & Harder, 2021). A survey provided a picture of the competency needs in program evaluation, as it measured the perceived ability and importance of each competency. The RDM was selected as a methodological alternative to other approaches, such as the Borich model, because it analyzes ordinal data using frequency distributions and standardized scores, avoiding the use of means with ordinal data and employing non-parametric tests for non-normally distributed data (Narine & Harder, 2021).

The focus of this study was the CES at UConn, known as UConn Extension, which is part of the College of Agriculture, Health, and Natural Resources. The target population comprises EPs, including all statewide Extension educators and faculty with partial appointments at UConn Extension. Administrative personnel were excluded. A census approach was used to recruit prospective respondents (N = 65). A response rate of 49.23% (32/65) was obtained. One case was omitted because it lacked all competency items. Missing data were treated with listwise deletion, as complete cases were required for the analysis.

Among respondents, most identified themselves as Extension faculty (93.10%; 27/29), while a smaller proportion identified themselves as educational program coordinators (6.90%; 2/29) (*missing* = 2). The results are representative of UConn Extension EPs, which restricts the generalizability of the results beyond this population.

The survey instrument was developed based on a desk review of the literature, including the 2018 American Evaluation Association (AEA) evaluator competencies. The instrument focused on assessing the evaluation competencies in two domains: (a) knowledge (cognitive), and (b) skills (behavioral), excluding affective aspects. These cognitive, skills, and affective objective domains of ECB efforts correspond to those of Preskill & Boyle (2008). Content validity was supported through expert review by one evaluation expert. The final instrument consisted of 36 components. It included seven multiple-choice questions that gathered preferences about the delivery of the training and the role of EPs. Additionally, there were 29 matrix-format items, designed to assess evaluation competencies and structured according to the evaluation phases. Each matrix-format item included two parallel measures: (a) the perceived importance, and (b) the perceived ability of a competence, in parallel (Borich, 1980). The items followed a unidirectional five-point Likert response format to measure self-perceived (a) abilities (*none, below average, average, above average, and essential*) and (b) the importance of those abilities (*none, below average, average, above average, and exceptional*). Additionally, one open-ended item asked respondents to identify competencies not covered in the survey, allowing for an exploration of competencies not included in the study. This study was limited to self-reported quantitative data from EPs, which may introduce bias in terms of the accuracy and objectivity of responses. However, self-assessment data can be valuable in supporting self-reflection on professional growth, as seen in this case, where the EPs self-assessed their evaluation of competencies.

The survey instrument was administered from November to December 2024 and was conducted online via Qualtrics (<https://www.qualtrics.com>). Recruitment followed the Tailored Design Method (Dillman et al., 2011), which included a pre-notice e-mail, an invitation to respond, and three reminders spaced one week apart. Descriptive statistics and the Wilcoxon signed-rank test were computed using IBM SPSS Statistics (Version 29) to estimate ranks, and the subsequent steps for estimating the ranked competency scores were performed using Microsoft Excel (Microsoft Corporation, 2024). This study received a determination of non-human subject research from the UConn-Storrs HRPP-IRB Office, protocol #NHSR24-0374.

Findings

RQ1. What are the Evaluation Competency Needs among University of Connecticut Extension Professionals?

Data analysis involved estimating the ranked discrepancy score (RDS) using the RDM proposed by Narine & Harder (2021). The analysis process followed the same steps described by these authors, as outlined in the subsequent text. Descriptive statistics consisted of frequencies for each competency. The Wilcoxon signed-rank test was performed using SPSS to estimate negative ranks (NR), positive ranks (PR), with zero representing equilibrium or a tied rank (TR). Then, the ranks were imported into Microsoft Excel, assigned weights as follows: NR% (-1), PR% (+1), and TR% (0). The weighted ranks were then converted into percentages to produce a standardized score, ranging from -100 to 100. Finally, the rank discrepancy scores were estimated as the sum of the values of the three percentage ranks corresponding to each competency item.

All assessed evaluation competencies had a negative RDS, with RDS spanning from -74.19 to -41.94 (see Table 1), indicating areas where competency gaps existed. Therefore, all assessed competencies were to be included in the professional development training aspect of the ECB intervention as topics for the program evaluation curriculum content. A higher negative RDS indicates a greater need for in-service

training. The most needed competencies were related to planning the evaluation endeavor, including linking program design and evaluation, as well as reporting, such as conducting qualitative analysis and utilizing data visualization techniques; the lowest were related to the execution and reporting phases, including conducting observations and interviews, and analyzing quantitative data using Excel.

Table 1*Ranked Discrepancy Scores: Extension Professionals' Competency Needs in Program Evaluation*

Rank	Topics: Competencies	Evaluation Phase	<i>n</i>	NR%	PR%	TR%	RDS
1	Analyze qualitative data using In Vivo software	Reporting	31	74.19	0.00	25.81	-74.19
2	Identify theories of behavior change	Planning	31	70.97	0.00	29.03	-70.97
2	Implement strategies to link program design and evaluation	Planning	31	70.97	0.00	29.03	-70.97
2	Develop an evaluation matrix or framework	Planning	30	73.33	3.33	23.33	-70.00
2	Utilize data visualization tools and techniques to present data effectively	Reporting	31	80.65	9.68	9.68	-70.97
3	Define targeted strategies to boost survey response rates	Planning	31	70.97	3.23	25.81	-67.74
3	Define a quality assurance plan for data collection	Planning	31	70.97	3.23	25.81	-67.74
3	Develop an IRB proposal	Planning	31	67.74	0.00	32.26	-67.74
3	Develop an evaluation budget	Planning	31	67.74	0.00	32.26	-67.74
3	Conduct needs assessments	Planning	31	70.97	3.23	25.81	-67.74
3	Conduct evaluation-risk analysis	Planning	31	67.74	0.00	32.26	-67.74
3	Analyze quantitative data using SPSS software	Execution	31	74.19	6.45	19.35	-67.74
3	Develop evaluation recommendations	Reporting	31	74.19	6.45	19.35	-67.74
3	Define an evaluation dissemination strategy for sharing results	Dissemination	31	70.97	3.23	25.81	-67.74
4	Design indicators	Planning	30	70.00	3.33	26.67	-66.67
4	Formulate a mixed-methods research design	Planning	30	70.00	3.33	26.67	-66.67
5	Create a comprehensive final evaluation report	Reporting	31	74.19	9.68	16.13	-64.52
6	Design questions for data collection instruments	Planning	30	66.67	3.33	30.00	-63.33
6	Design an evaluation work plan	Planning	30	66.67	3.33	30.00	-63.33
7	Identify the key stakeholder groups	Planning	31	58.06	6.45	35.48	-51.61
7	Conduct focus group discussions	Execution	31	58.06	6.45	35.48	-51.61
8	Develop evaluation questions	Planning	30	56.67	6.67	36.67	-50.00
9	Develop a logic model	Planning	31	51.61	3.23	45.16	-48.39
10	Define program goals and objectives	Planning	31	45.16	0.00	54.84	-45.16
10	Conduct interviews	Execution	31	51.61	6.45	41.94	-45.16
10	Utilize the Qualtrics online tool	Reporting	31	58.06	12.90	29.03	-45.16
11	Differentiating between input, outputs, outcomes, and impact	Planning	30	46.67	3.33	50.00	-43.33
12	Conduct direct observations	Execution	31	48.39	6.45	45.16	-41.94
12	Analyze quantitative data using Excel	Reporting	31	54.84	12.90	32.26	-41.94

Note: NR = Negative Ranks, PR = Positive Ranks, TR = Tied Ranks, RDS = Ranked Discrepancy Score.

RQ2. How can the Results of an Evaluation Competency Needs Assessment Based on the Ranked Discrepancy Model Inform the Content and Sequencing of the Evaluation Curriculum for a Professional Development Training?

The needed competencies were quantitatively grouped based on their RDS (see Table 1). Second, the rankings were structured into six groups based on sharing the same or similar ranks, and these groups mirror their priorities (see Table 2). The first group encompassed the five top competency needs, each with a range of RDS values from -74.19 to 70.00. The second group comprised nine competencies with the same RDS value of -67.74. The third group included five competencies with RDS values ranging from -66.67 to -63.33. The fourth group comprised four competencies with RDS values ranging from -51.61 to -48.39. The fifth group comprised seven competencies with the same RDS value of -45.16. The last and sixth group included three competencies with RDS values ranging from 43.33 to -41.94.

Because some competencies had the same RDS or very similar RDS (see Table 1), a second criterion was considered to determine their order for inclusion as topics in the program evaluation curriculum. This second criterion consisted of the sequence of evaluation phases as follows: (a) planning, (b) execution, (c) reporting, and (d) dissemination (see Table 2). Thirdly, within each phase, the order of the tasks within the evaluation process was considered. Therefore, within each RDS-ranked group, the identified competencies were organized according to the evaluation phases and the sequence of tasks.

Table 2*Priority Topics to Include in the Evaluation Curriculum for Professional Development*

Group	Topics: Needs in Evaluation Competency	Evaluation Phase	RDS
Group 1	Identify theories of behavior change	Planning	-70.97
	Implement strategies to link program design and evaluation	Planning	-70.97
	Develop an evaluation matrix or framework	Planning	-70.00
	Analyze qualitative data using In Vivo software	Reporting	-74.19
	Utilize data visualization tools and techniques to present data effectively	Reporting	-70.97
Group 2	Define targeted strategies to boost survey response rates	Planning	-67.74
	Define a quality assurance plan for data collection	Planning	-67.74
	Develop an IRB proposal	Planning	-67.74
	Develop an evaluation budget	Planning	-67.74
	Conduct needs assessments	Planning	-67.74
	Conduct evaluation-risk analysis	Planning	-67.74
	Analyze quantitative data using SPSS software	Execution	-67.74
	Develop evaluation recommendations	Reporting	-67.74
Define an evaluation dissemination strategy for sharing results	Dissemination	-67.74	
Group 3	Design indicators	Planning	-66.67
	Formulate a mixed-methods research design	Planning	-66.67
	Design questions for data collection instruments	Planning	-63.33
	Design an evaluation work plan	Planning	-63.33
	Create a comprehensive final evaluation report	Reporting	-64.52
Group 4	Identify key stakeholder groups	Planning	-51.61
	Conduct focus group discussions	Execution	-51.61
	Develop evaluation questions	Planning	-50.00
	Develop a logic model	Planning	-48.39
Group 5	Define program goals and objectives	Planning	-45.16
	Conduct interviews	Execution	-45.16
	Utilize the Qualtrics online tool for data collection	Reporting	-45.16
Group 6	Differentiate input, outputs, outcomes, and impact	Planning	-43.33
	Conduct direct observations	Execution	-41.94
	Analyze quantitative data using Excel	Reporting	-41.94

Curriculum Content, Structure, and Sequence of Topics

The NA results informed decisions about the topics to include in the curriculum, as well as their sequence. These topics comprised the design of the curriculum content for the professional development component of an ECB intervention for UConn Extension EPs (see Table 2). The NA results served as the basis for selecting curriculum topics and provided the foundation for designing content. In addition, one organizational contextual factor influenced the order of training delivery, the timing of the reporting cycle in which the professional development component of the ECB intervention was launched, which created

urgency for offering specific topics as part of the training. Thus, the first two training sessions addressed topics such as the design of data collection instruments and strategies to boost survey response rates.

Conclusions, Discussions, Recommendations

This study aimed to identify the program evaluation competencies needs among EPs at UConn Extension and define their priorities through a NA to inform content and sequencing of a program evaluation curriculum. The results revealed a competency gap across all assessed evaluation competency areas, consistent with early research in the Cooperative Extension field in the United States (Narine & Ali, 2020). One factor that may explain this evaluation competency deficit is that the recruitment of EPs is primarily based on subject expertise, an issue identified by Chaudhary et al. (2020). This deficit warrants immediate action at the organizational level, which involves continuing efforts to offer professional development training as a core component of ECB interventions, as suggested by Preskill and Boyle (2008) and Taylor-Powell and Boyd (2008). The organizational-level efforts are designed to achieve individual-level outcomes, ultimately having an impact on the organization. Additionally, research suggests that the program evaluation competency of EPs has been identified as a key component of their job responsibilities (Cooper & Graham, 2001; Harder et al., 2010; Diaz et al., 2020; Ghimire & Martin, 2011; Rodgers et al., 2012).

Significantly, this study supports the use of NA to inform the planning of in-service professional development training as a key component of ECB efforts, as previously suggested by Cooper and Graham (2001), Ghimire and Martin (2011), Labin et al. (2012), Norton et al. (2016), and Preskill and Boyle (2008). In adult education, understanding the diverse needs of learners is crucial for tailoring in-service training to their specific needs, as noted by Knowles (1978), particularly in the context of ECB. Additionally, the results of this study raise important practical implications about the key role of NA in identifying competency priorities, particularly when the demanding work responsibilities of EPs, an issue previously identified by Russell et al. (2019), may limit their participation in the in-service professional development efforts.

Methodologically, one important contribution of this study is the novel application of the RDM in the context of the CES, presenting an account of the process for assessing needed competencies and defining priorities using the RDM (Narine & Harder, 2021), and providing a structured method for determining the order and priorities of topics for inclusion in the evaluation curriculum as part of professional development efforts. This study addressed the methodological limitations of previous ranking approaches previously described by Narine and Harder (2021), such as the Borich model, which relies on calculating means from ordinal data. The RDM utilizes frequencies to generate standardized scores, providing a more robust methodological approach for analyzing ordinal and non-normally distributed data. This work also provided a benchmark for conducting NA using this approach to identify competency priorities, particularly with a wide range of CES audiences and locations, as suggested by Harder and Narine (2024).

The insights from this study may be of assistance to professional development instructional designers as part of ECB efforts in CES, informing decisions on which quantitative approaches to use for NA, such as the RDM, and how to organize the interpretation of the findings based on the evaluation phases. By integrating the RDM results with the evaluation phases, this study provides a replicable process for curriculum design that directly responds to the needs of adult learners engaged in professional development efforts as part of major ECB interventions.

This study aims to shed new light on the decision-making process when defining priorities, particularly when evaluation competencies identified share the same ranking. One reasonable approach to tackling this issue is to combine the NA results with criteria related to the phases of the evaluation process. In doing so, the content of the evaluation curriculum for in-service professional development efforts can be organized around identified needs, and the sequence determined by a combination of priorities and the

evaluation phases. In such a case, the competencies are sequenced according to the phases of the evaluation process, mirroring the order in which those involved in the evaluation typically conduct their evaluation endeavors. This implication extends the views of Knowles (1978), who suggested that adult education curricula should follow a problem-centered orientation, “organized around problem areas” (p. 48). In this case, the identified needs and the phases of the evaluation process are the problem areas to consider when planning professional development efforts. Notably, this study offers valuable insights into decision-making for organizing the NA process, from data collection to the interpretation of results, a strategy that other NA efforts could utilize. Additionally, the process of defining the sequence of topics in the curriculum accounted for contextual factors influencing the feasibility of implementation, suggesting that the design of ECB interventions should also account for the uniqueness of the context, as noted by Franz and Archibald (2018).

This study is limited to EPs within a single Extension system from a single state; therefore, the results may not apply to all CES contexts. However, the methodological approach used, the RDM, offers some insights into conducting NAs in other CES settings and similar in-service professional development efforts. Future research should replicate this study in different CES contexts to examine the impact of the RDM-based prioritization process on the design and relevance of evaluation curricula for professional development efforts aimed at building evaluation capacity. Future research should integrate NA with qualitative methods to enhance interpretation, providing deeper insights into the contextual factors that may influence competency needs and priorities.

The main practical implication of these findings is that they provide instructional designers and Extension administrators with a data-driven process for designing professional development efforts that align with EPs' priorities. This study addressed the question of which learning needs should be targeted in the evaluation curriculum as part of professional development efforts in the CES context. While this question has been extensively examined in K-12 education, it has received limited attention in the context of the CES. Therefore, this study has practical implications for the design of evaluation curricula among EPs in CES, as well as for structuring professional development efforts to build evaluation capacity and ensure these efforts are relevant to the needs of EPs, thereby further meeting OECD-relevant evaluation criteria.

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