

Appendix Table 1. Statements by Cluster

Cluster 1: Communicate research findings

- Graphic depiction of research results
- Write findings/conclusions for a variety of journals
- How to disseminate beyond academia
- Present useful nuggets of implications, not just statistical findings
- Social media, social networking
- Appropriate, tailored communication for targeted audiences with an understanding of their different perspectives
- Summarize study findings into compelling story ideas tailored for practice and policy makers
- Write in short, simple language, without jargon, for the lay person
- Publish work in lay venues or practice focused venues in addition to research journals
- Being able to translate the findings from research into practical, implementable actions
- Media relations
- Press releases
- Articulate how findings apply to real world settings to benefit all users
- Present research results in a simple and intuitively understandable way
- Marketing and sales

Cluster 2: Improve practice partnerships

- Potential negative consequences of policy and practice decisions
- Improved understanding of priorities and motivations of stakeholders (policy makers and practitioners)
- Systematic assessment of local stakeholder needs
- Training community stakeholders in feasible, relevant skills to identify needs, select and adopt evidence based practices, adapt, and implement
- Building lasting partnerships through work that benefits all partners, so they continue to engage
- Understand the impact that the research has on specific communities
- Respect for the realities of community providers and usual care settings
- Develop long-term and engaged relationships with policy makers, before seeking assistance with research funding
- Public-private partnerships
- The legal concerns of people in these settings
- The nature and process of policy making and the political system
- How to quickly and smoothly deal with turn-over in practice and policy settings
- Community empowerment
- Identify support for and opposition to implementation by key stakeholders
- Engaging stakeholders at all levels/contexts to ensure full implementation
- Develop effective relationships and partnerships with community partners, practitioners, and policy makers

Cluster 3: Make research more relevant

- Ensuring the emphasis of research will be of value to practitioners and policy makers, not just an interesting research question
- Better identification of questions whose answers are likely to change practice and policy

- Health literacy of different populations
- Engagement and collaboration skills
- Focus on helping find plausible solutions
- Involve practitioners in research question development
- Understand and work skillfully with power dynamics in organizations
- Participatory research that engages stakeholders in all phases of design to produce useful products

Cluster 4: Strengthen communication skills

- Provide tools to translate research into action
- Talk to the exact policy issue at hand
- Strong communication skills, empathy, and perspective taking skills
- Active listening skills

Cluster 5: Consider and enhance fit

- Build flexibility into the guidance of evidence-based programs and interventions to allow for accommodation of specific populations and settings
- How to plan for sustainability early in the process and achieve sustainability and institutionalizations of evidence based initiatives
- Adapt an evidence-based program to cultural or the SES needs of priority populations
- Aligning incentives for implementation with administrative objectives
- How to access best practices with real world examples for implementing the intervention
- Affecting organizational culture and behavior change
- Learning strategies to increase readiness of practitioners and organizational leaders
- The determinants of sustainment and how those differ from determinants of other D&I concepts (e.g., adoption, implementation)
- Select implementation strategies based on characteristics of the setting and innovation
- Incorporating strategies to obtain reimbursement for programs as part of the research evidence

Cluster 6: Develop research methods and measures

- Purposive sampling for qualitative research
- Training in qualitative research methods and data analysis
- Mixed methods training - better integration of qualitative and quantitative
- The conduct of intervention research in community settings
- Research methods for investigating discontinuation (are they different than examining sustainment?)
- Understand the gaps in the current literature
- Develop studies that tease out the effects of strategies instead of just programs to increase the feasibility of implementation
- Using large datasets
- Data collection in real practice settings
- Diffusion of innovation and related theories
- Develop more methods to accommodate real-life practice and policy
- Apply intervention design and evaluation frameworks
- Develop pragmatic measures
- Measurement of impact

- Methods that account for multi-level and dynamic behavior (e.g., systems science methods)
 - Study designs (e.g., adaptive designs and methods, clinical trial methodologies, simulation modeling)
 - Conceptualizing good D&I research questions
 - Improve generalizability without sacrificing validity
 - Designing practice-based research for a practice-based research network
 - Impact of reliability and validity on use of research findings in practice
 - Develop measures with strong psychometric properties
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Cluster 7: Build capacity for research

- How to use data to effectively address ideology
 - Obtain external competitive funding for the research
 - How to apply cost-effectiveness and cost benefit analyses so that they can communicate effectively the importance of the research in a practical/relevant way to policy makers
 - How to select indicators for progress improvement and how to report these data in a way that is meaningful to others
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Cluster 8: Ensure research is meaningful

- Engage trainees and students in the idea that research should be relevant and useful from the beginning of their training
 - Whom to target when trying to assess implementation status
 - Academic-community partnership models and participatory research designs
 - Understand how to compare and prioritize options
 - Building and managing interdisciplinary research teams to partner across disciplines and perspectives
 - Understand (and mitigate) the harms arising from the misuse of the research evidence
 - How to apply return on investment frameworks to social, public health programs and services
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Cluster 9: Understand multi-level context

- Briefly assess the extent to which an intervention is being implemented
 - Balance between fit and fidelity and tracking fidelity along the way
 - Predictors and determinants of implementation effectiveness at multiple levels, including the individual, group, organization, and system
 - Continuous quality improvement cycles
 - Systematic approaches to adapting interventions
 - Understand individual behavioral determinants in relation to the influence of contextual factors
 - Individual behavior change
 - How to briefly assess barriers to implementation
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D&I, dissemination and implementation

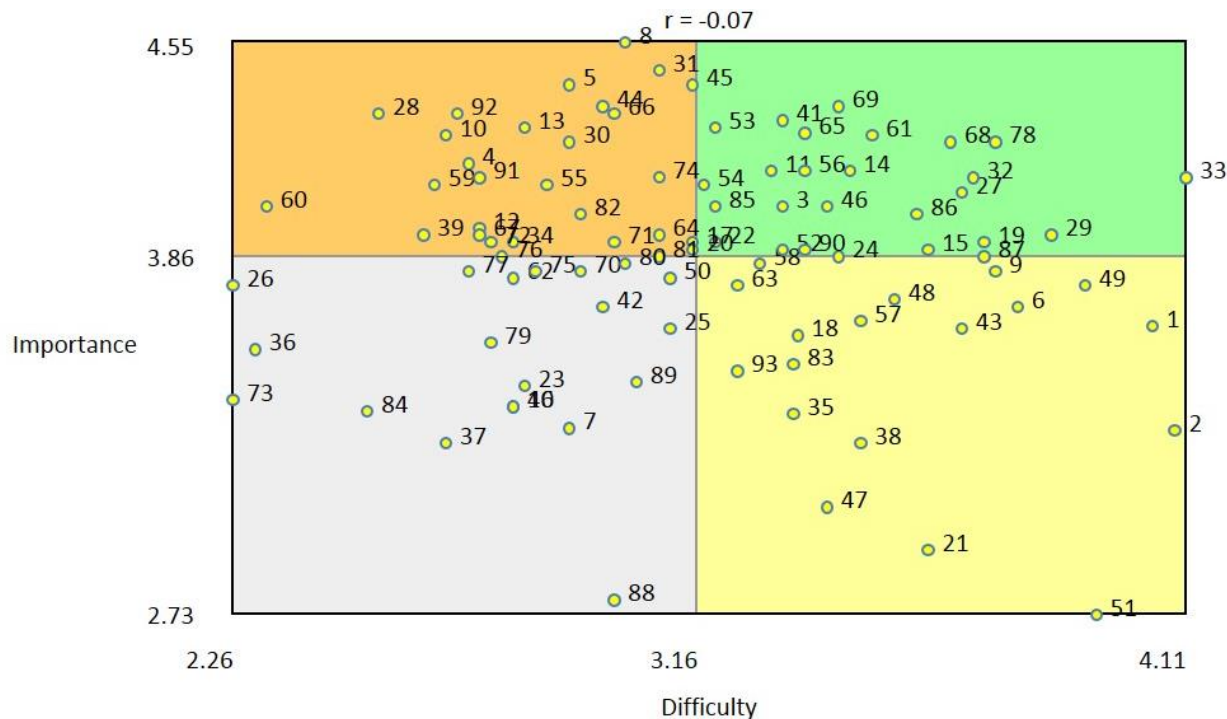
Appendix Table 2. Mapping of Existing Mentored Training for Dissemination and Implementation Research in Cancer (MT-DIRC) Competencies Onto Each Cluster

Competency number	Competency
Cluster 1. Communicate research findings	
A1	Define and communicate D&I research terminology
Cluster 2. Improve practice partnerships	
D1	Describe the importance of incorporating the perspectives of different stakeholder groups (e.g., patient/family; employers, payers, healthcare settings, public organizations, community and policy makers).
D4	Determine when engagement in participatory research is appropriate with D&I research.
D6	Identify and apply techniques for stakeholder analysis and engagement when implementing evidence-based practices.
D9	Identify sites to participate in D&I studies and negotiate or provide incentives to secure their involvement.
D10	Identify and develop sustainable partnerships for D&I research.
D11	Describe how to measure successful partnerships for D&I research.
Cluster 3. Make research more relevant	
A4	Identify the potential impact of disseminating, implementing, and sustaining effective interventions.
A8	Identify existing gaps in D&I research.
A9	Identify the potential impact of scaling down (i.e., de-implementing) an ineffective but often used intervention.
B4	Describe a process for designing for dissemination (planning for adoption, implementation and sustainability during the intervention development stage).
Cluster 4. Strengthen communication skills	
Cluster 5. Consider and enhance fit	
A6	Determine which evidence-based interventions are worth disseminating and implementing.
B3	Identify core elements (effective ingredients) of effective interventions and recognize risks of making modifications to these.
B5	Describe the relationships between various organizational dimensions (e.g., climate, culture) and D&I research.
C11	Effectively integrate the concepts of sustainability/sustainment and the rationale behind them in D&I study design
D7	Identify a process for adapting an intervention and how the process is relevant to D&I research.
D12	Use evidence to evaluate and adapt D&I strategies for specific populations, settings, contexts, resources, and/or capacities.
Cluster 6. Develop research methods and measures	
A3	Differentiate between D&I research and other related areas, such as efficacy research and effectiveness research.
B1	Describe a range of D&I strategies, models, and frameworks.
B2	Identify appropriate conceptual models, frameworks, or program logic for D&I change.

C1	Describe the core components of external validity and their relevance to D&I research.
C2	Identify common D&I measures and analytic strategies relevant for your research question(s).
C3	Describe gaps in D&I measurement and critically evaluate how to fill them.
C5	Describe the application and integration of mixed-methods (quantitative and qualitative) approaches in D&I research.
C6	Apply common D&I measures and analytic strategies relevant for your research question(s) within your model/framework.
C7	Identify possible methods to address external validity in study design reporting and implementation.
C9	Identify and articulate the trade-offs between a variety of different study designs for D&I research.
C12	Effectively explain and incorporate concepts of de-adoption and de-implementation into D&I study design.
D2	Describe the concept and measurement of fidelity.
D3	Articulate the strengths and weaknesses of participatory research in D&I research.
Cluster 7. Build capacity for research	
B6	Explain how knowledge from disciplines outside of health (e.g., business, marketing, and engineering) can help inform further trans-disciplinary efforts in D&I research.
C13	Incorporate methods of economic evaluation (e.g., implementation costs, cost-effectiveness) in D&I study design.
Cluster 8. Ensure research is meaningful	
A5	Describe the range of expertise needed to conduct D&I research (e.g., mixed method experience, economic, organizational, policy, clinical).
C4	Identify and measure outcomes that matter to stakeholders, adopters, and implementers.
Cluster 9. Understand multi-level context	
A7	Assess, describe, and quantify (where possible) the context for effective D&I (setting characteristics, culture, capacity, and readiness).
B7	Identify and articulate the interplay between policy and organizational processes in D&I.
C8	List the potential roles of mediators and moderators in a D&I study.
C10	Describe how to frame and analyze the context of D&I as a complex system with interacting parts.
D5	Describe the appropriate process for eliciting input from community-based practitioners for adapting an intervention.
D8	Explain how to maintain fidelity of original interventions during the adaption process.
Competencies not mapping onto a cluster	
A2	Define what is and what is not D&I research.
A10	Formulate methods to address barriers of D&I research.
C14	Evaluate and refine innovative scale-up and spread methods (e.g., technical assistance, interactive systems, novel incentives and ‘pull’ strategies).

D&I, dissemination and implementation

Appendix Figure 1. Go-zones categorize statements such based on importance and difficulty simultaneously, such that statements in the green zone ranked high for importance and low for difficulty and those in the white zone ranked high for difficulty and low for importance. The statements corresponding to each number are listed in the table below.



#	Statement
1	Graphic depiction of research results
2	Purposive sampling for qualitative research
3	Potential negative consequences of policy and practice decisions
4	Build flexibility into the guidance of evidence-based programs and interventions to allow for accommodation of specific populations and settings
5	Improved understanding of priorities and motivations of stakeholders (policy makers and practitioners)
6	Write findings/conclusions for a variety of journals
7	How to use data to effectively address ideology
8	Ensuring the emphasis of research will be of value to practitioners and policy makers, not just an interesting research question
9	Training in qualitative research methods and data analysis
10	How to plan for sustainability early in the process and achieve sustainability and institutionalizations of evidence based initiatives
11	Systematic assessment of local stakeholder needs
12	Adapt an evidence-based program to cultural or the SES needs of priority populations
13	Better identification of questions whose answers are likely to change practice and policy
14	How to disseminate beyond academia
15	Mixed methods training - better integration of qualitative and quantitative

- 16 Aligning incentives for implementation with administrative objectives
- 17 Provide tools to translate research into action
- 18 How to access best practices with real world examples for implementing the intervention
- 19 Present useful nuggets of implications, not just statistical findings
- 20 The conduct of intervention research in community settings
- 21 Social media, social networking
- 22 Appropriate, tailored communication for targeted audiences with an understanding of their different perspectives
- 23 Research methods for investigating discontinuation (are they different than examining sustainment?)
- 24 Summarize study findings into compelling story ideas tailored for practice and policy makers
- 25 Talk to the exact policy issue at hand
- 26 Training community stakeholders in feasible, relevant skills to identify needs, select and adopt evidence based practices, adapt, and implement
- 27 Briefly assess the extent to which an intervention is being implemented
- 28 Building lasting partnerships through work that benefits all partners, so they continue to engage
- 29 Write in short, simple language, without jargon, for the lay person
- 30 Understand the impact that the research has on specific communities
- 31 Respect for the realities of community providers and usual care settings
- 32 Understand the gaps in the current literature
- 33 Engage trainees and students in the idea that research should be relevant and useful from the beginning of their training
- 34 Develop studies that tease out the effects of strategies instead of just programs to increase the feasibility of implementation
- 35 Health literacy of different populations
- 36 Develop long-term and engaged relationships with policy makers, before seeking assistance with research funding
- 37 Public-private partnerships
- 38 Using large datasets
- 39 Affecting organizational culture and behavior change
- 40 The legal concerns of people in these settings
- 41 Data collection in real practice settings
- 42 Learning strategies to increase readiness of practitioners and organizational leaders
- 43 Publish work in lay venues or practice focused venues in addition to research journals
- 44 Being able to translate the findings from research into practical, implementable actions
- 45 Engagement and collaboration skills
- 46 Whom to target when trying to assess implementation status
- 47 Media relations
- 48 Academic-community partnership models and participatory research designs
- 49 Diffusion of innovation and related theories
- 50 Balance between fit and fidelity and tracking fidelity along the way
- 51 Press releases
- 52 Articulate how findings apply to real world settings to benefit all users
- 53 Strong communication skills, empathy, and perspective taking skills
- 54 Focus on helping find plausible solutions

- 55 Predictors and determinants of implementation effectiveness at multiple levels, including the individual, group, organization, and system
- 56 Involve practitioners in research question development
- 57 Continuous quality improvement cycles
- 58 Understand how to compare and prioritize options
- 59 Develop more methods to accommodate real-life practice and policy
- 60 Understand and work skillfully with power dynamics in organizations
- 61 Apply intervention design and evaluation frameworks
- 62 The nature and process of policy making and the political system
- 63 The determinants of sustainment and how those differ from determinants of other D&I concepts (e.g., adoption, implementation)
- 64 Develop pragmatic measures
- 65 Measurement of impact
- 66 Building and managing interdisciplinary research teams to partner across disciplines and perspectives
- 67 Methods that account for multi-level and dynamic behavior (e.g., systems science methods)
- 68 Study designs (e.g., adaptive designs and methods, clinical trial methodologies, simulation modeling)
- 69 Conceptualizing good D&I research questions
- 70 Obtain external competitive funding for the research
- 71 Systematic approaches to adapting interventions
- 72 How to apply cost-effectiveness and cost benefit analyses so that they can communicate effectively the importance of the research in a practical/relevant way to policy makers
- 73 How to quickly and smoothly deal with turn-over in practice and policy settings
- 74 Select implementation strategies based on characteristics of the setting and innovation
- 75 Understand (and mitigate) the harms arising from the misuse of the research evidence
- 76 Improve generalizability without sacrificing validity
- 77 How to apply return on investment frameworks to social, public health programs and services
- 78 Present research results in a simple and intuitively understandable way
- 79 Community empowerment
- 80 Identify support for and opposition to implementation by key stakeholders
- 81 Understand individual behavioral determinants in relation to the influence of contextual factors
- 82 Participatory research that engages stakeholders in all phases of design to produce useful products
- 83 Individual behavior change
- 84 Incorporating strategies to obtain reimbursement for programs as part of the research evidence
- 85 How to select indicators for progress improvement and how to report these data in a way that is meaningful to others
- 86 Active listening skills
- 87 How to briefly assess barriers to implementation
- 88 Marketing and sales
- 89 Designing practice-based research for a practice-based research network
- 90 Impact of reliability and validity on use of research findings in practice
- 91 Engaging stakeholders at all levels/contexts to ensure full implementation

Appendix
Dissemination and Implementation Science Training Needs: Insights From Practitioners and Researchers
Tabak et al.

- 92 Develop effective relationships and partnerships with community partners, practitioners, and policy makers
 - 93 Develop measures with strong psychometric properties
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D&I, dissemination and implementation