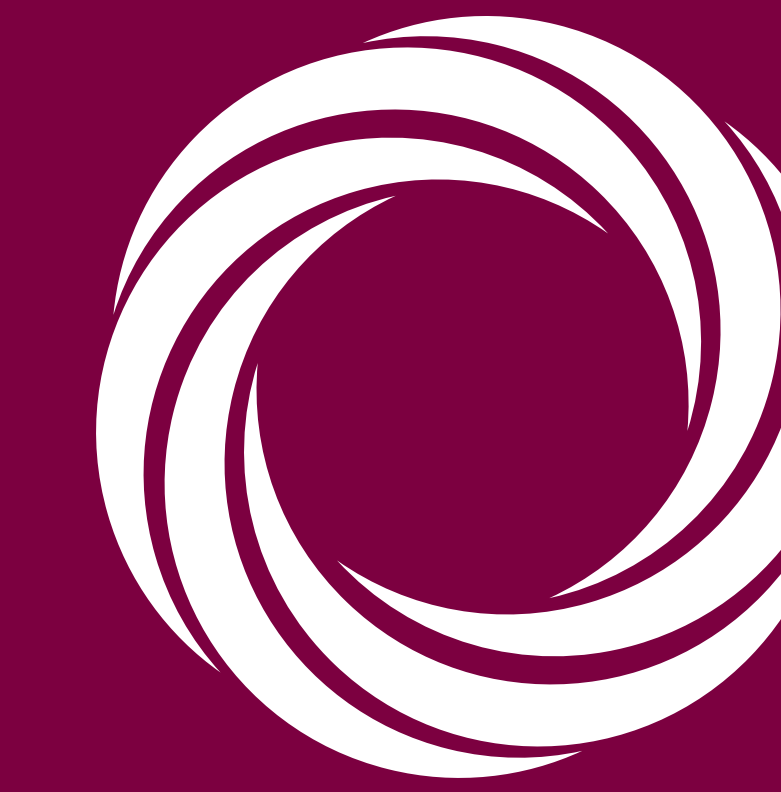


Opportunities for skill development in knowledge translation through online learning



National Collaborating Centre for Methods and Tools

Centre de collaboration nationale des méthodes et outils

Authors: Maureen Dobbins • Donna Ciliska • Jenny Yost • Sunita Chera • Jeannie Mackintosh • Pamela Forsyth

Acknowledgements: Jacqueline Muresan • Karey Shuhendler

www.nccmt.ca

Introduction:

Developed by the National Collaborating Centre for Methods and Tools (NCCMT), online learning opportunities develop knowledge and skills for knowledge translation among public health professionals and students.

NCCMT offers a suite of free, self-paced online learning resources:

- **Learning Centre** houses NCCMT learning opportunities. Users login to their personal accounts to track their learning.
- **Online Learning Modules** enhance knowledge and skill development.
- **Search Pyramids** help users to quickly access relevant, timely public health research evidence.

These online learning resources offer increased accessibility and flexibility over traditional training modalities to meet the learning needs of:

- **Practitioners** – Online learning can enhance professional development for emerging job functions and roles in response to changing work demands.
- **Organizations** – Online learning can be part of orientation for new employees and can inform performance appraisals.
- **Instructors and Students** – Online learning modules have been incorporated in graduate and undergraduate course curricula to supplement in-class instruction.

Rationale for Developing Online Learning Opportunities:

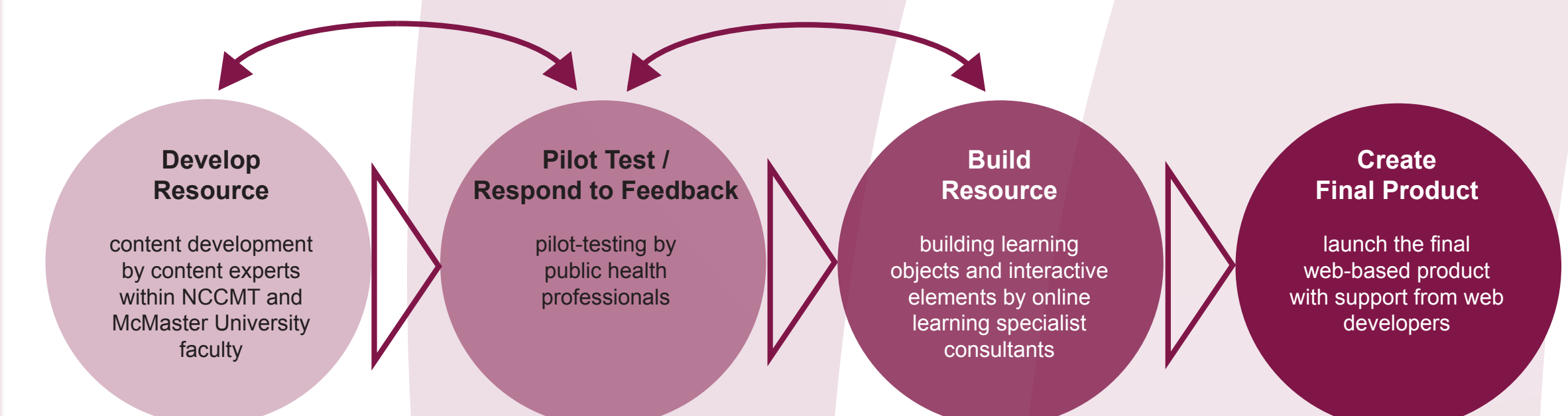
For several years, in-person workshops and training from the National Collaborating Centre for Methods and Tools (NCCMT) have been highly accessed across Canada. Results from an environmental scan, online surveys and evaluation reports indicated an interest among NCCMT target users in online educational products.

Online learning allows users to gain knowledge and practise skills in a self-paced learning environment. Beginning with low-level skills and progressing to more complex skills increases learners' perceived self-efficacy (Hodges, 2008). Embedded learning objects, interactive elements, and user-friendly navigation enable learners to develop in-depth knowledge and skills at their own pace (CDC, 2013; Alexander et al., 2010) and may reinforce concepts explored in traditional in-person workshops. Online learning opportunities are part of NCCMT's comprehensive strategy to build capacity for evidence-informed public health in Canada.

Methods:

Development of Online Learning Opportunities

Developing online learning modules and Search Pyramids is an iterative process. Throughout the development process, feedback from users is sought and incorporated.



Evaluation of Online Learning Modules and Searching Pyramids:

Pre- and post-assessment questionnaires collect information on demographics, self-efficacy, knowledge and user experience. Feedback forms collect information on a user satisfaction around content and format. Quantitative data are analyzed using descriptive statistics; qualitative data are analyzed using content analysis methods.

Results:

Demographic data is reported on three online learning modules – Introduction to Evidence-Informed Decision Making [EIDM] (launched May 2010) and Critical Appraisal of Intervention Studies [CAIS] (launched January 2011), and Quantitative Research Designs 101 [QRD] (launched July 2012) – from when they were launched to February, 2013. Self-efficacy data and data on effectiveness of online modules in supporting users' learning is reported for EIDM and CAIS modules. Preliminary data is reported on the impact of online learning module on users' knowledge for QRD module.

Who uses NCCMT's online learning modules?

2767 individuals have accessed NCCMT's online learning modules (EIDM, CAIS, QRD). Certificates of completion have been issued to 978 (35.3% completion). Actual completion rates may be higher. This number does not include individuals who may not have requested a certificate or who may have experienced difficulty in obtaining a certificate. The figure below provides information on how many people are accessing NCCMT's online learning modules, completing the modules (based on the number of certificates issued) and their country of origin.

2767 Total Number of People Who Have Accessed NCCMT Online Modules (from May 2010 to Feb 2013)			
1759 People Accessed Evidence-Informed Decision Making (EIDM) Module (launched May 2010)	401 People Accessed Critical Appraisal of Intervention Studies (CAIS) Module (launched Jan 2011)	607 People Accessed Quantitative Research Designs (QRD) Module (launched July 2012)	
• 978 Certificates Issued (35.3% completion rate)	• 663 Certificates Issued (37.7% completion rate)	• 177 Certificates Issued (44.1% completion rate)	• 138 Certificates Issued (22.7% completion rate)
• Country of Origin: • 68.7% Canada • 24.9% Other Country • 6.4% No Response	• Country of Origin: • 74.6% Canada • 16.7% Other Country • 8.70% No Response	• Country of Origin: • 44.4% Canada • 49.6% Other Country • 6% No Response	• Country of Origin: • 68% Canada • 32% Other Country

Where do they work?

Of participants from Canada (n=2073) who access the three online learning modules, most work in Ontario (44.5%), followed by British Columbia (12.5%) and Saskatchewan (12.0%). These three provinces represent over two-thirds of users. (see figure 1)

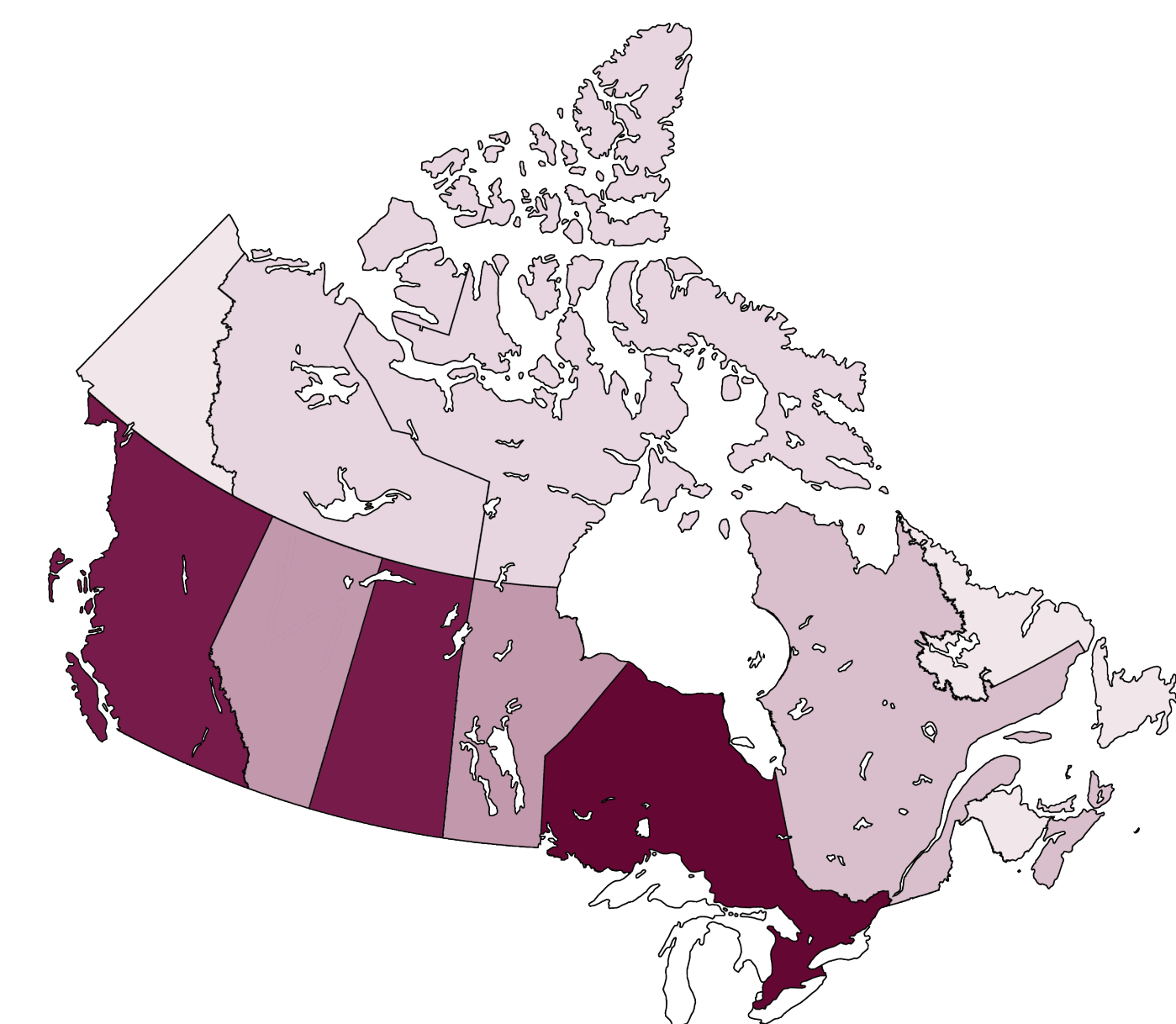


Figure 1: Map Showing Relative Concentration from Canadian Provinces of Users Accessing NCCMT Online Learning Modules (from Launch to Feb 2013) (darker colour indicates greater number of users)

What do they do?

Users from many different public health roles and positions access NCCMT's online learning modules. Nurses represent the largest public health role using the three modules (27.3%, n=2767). Students are the next largest group to access the EIDM module (23.1%, n=1759), whereas policy developer/analysts are the second largest group to access the CAIS module (11.0%, n=401). For QRD module, "Other" is the second largest group (17%, n=607), which may indicate that users from outside of public health are accessing this module. Across other public health roles, similar proportions access all three modules. (see figure 2)

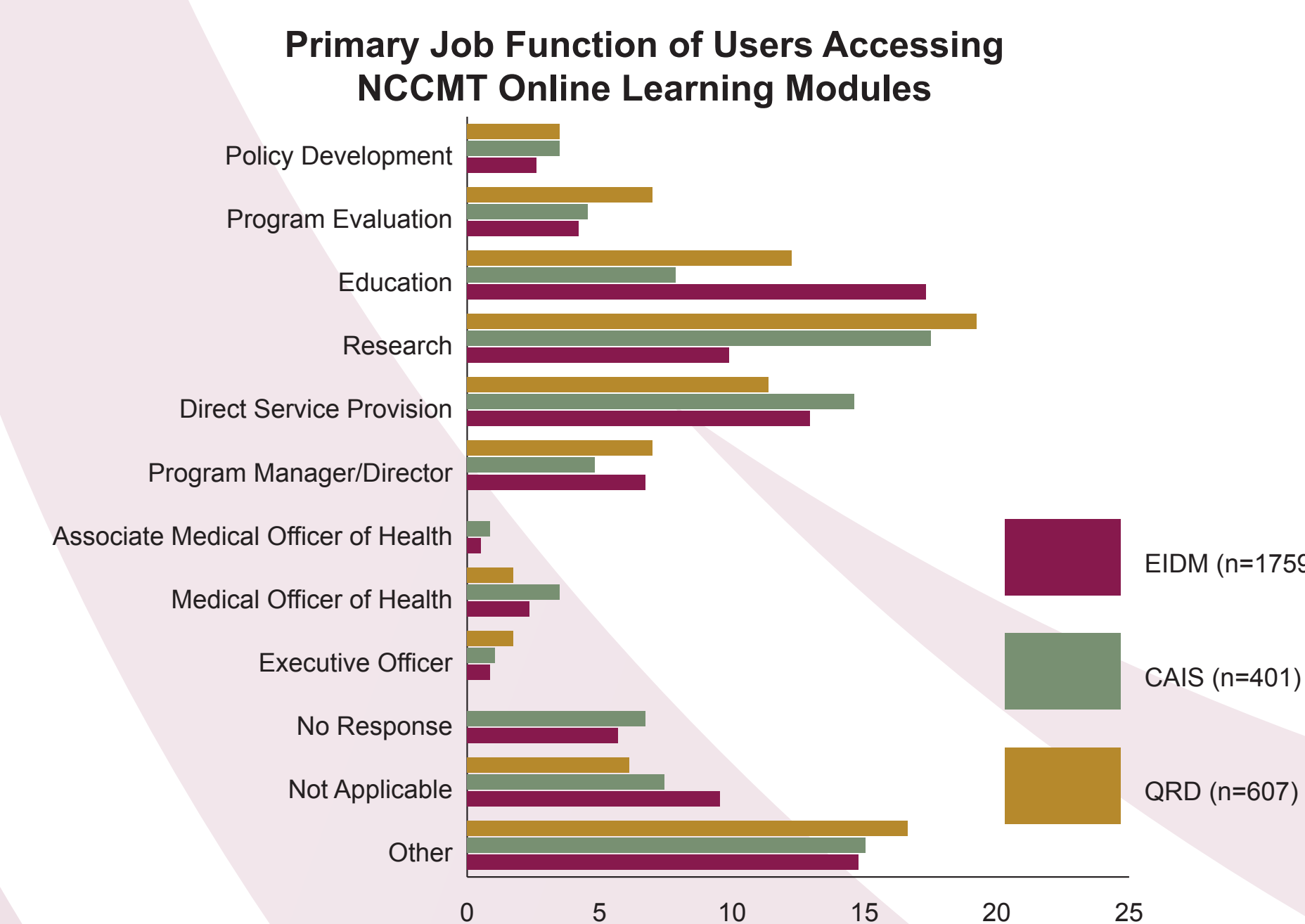


Figure 2: Public Health Role/Position of Users Accessing Online Learning Modules as Percentages (From Launch to Feb 2013)

Users accessing the online learning modules have various primary job functions. A significant proportion of users indicate direct service provision as their primary job function (14.8%, n=1759 for EIDM; 16.7%, n=401 for CAIS; 13%, n=607 for QRD). Users who identify their primary job function as education are the largest group of users accessing the EIDM module (19.8%, n=1759), while users with research as their main job function are the largest groups accessing the CAIS module (20%, n=401) and QRD module (22%, n=607). A significant proportion of users accessing the modules indicate "Other" and "Not Applicable" as their main job function (16.9% and 10.9% respectively, n=1759 for EIDM; 17.2% and 8.5% respectively, n=401 for CAIS; 19% and 7% respectively, n=607 for QRD). This may indicate that users from sectors outside public health are accessing NCCMT's online learning modules.

Impact of NCCMT's Online Learning Modules

Learner Self-Efficacy (EIDM and CAIS modules):

Self-efficacy scores measured pre- and post-assessment for EIDM and CAIS modules using a Likert scale, ranging from 0 to 5 (where 0= do not know/no answer to 5=strongly agree), are illustrated in below in figures 3 (EIDM) and 4 (CAIS). Users accessing the EIDM and CAIS modules experience a statistically significant increase in perceived self-efficacy across all domains (Wilcoxon signed-rank test, P < 0.01).

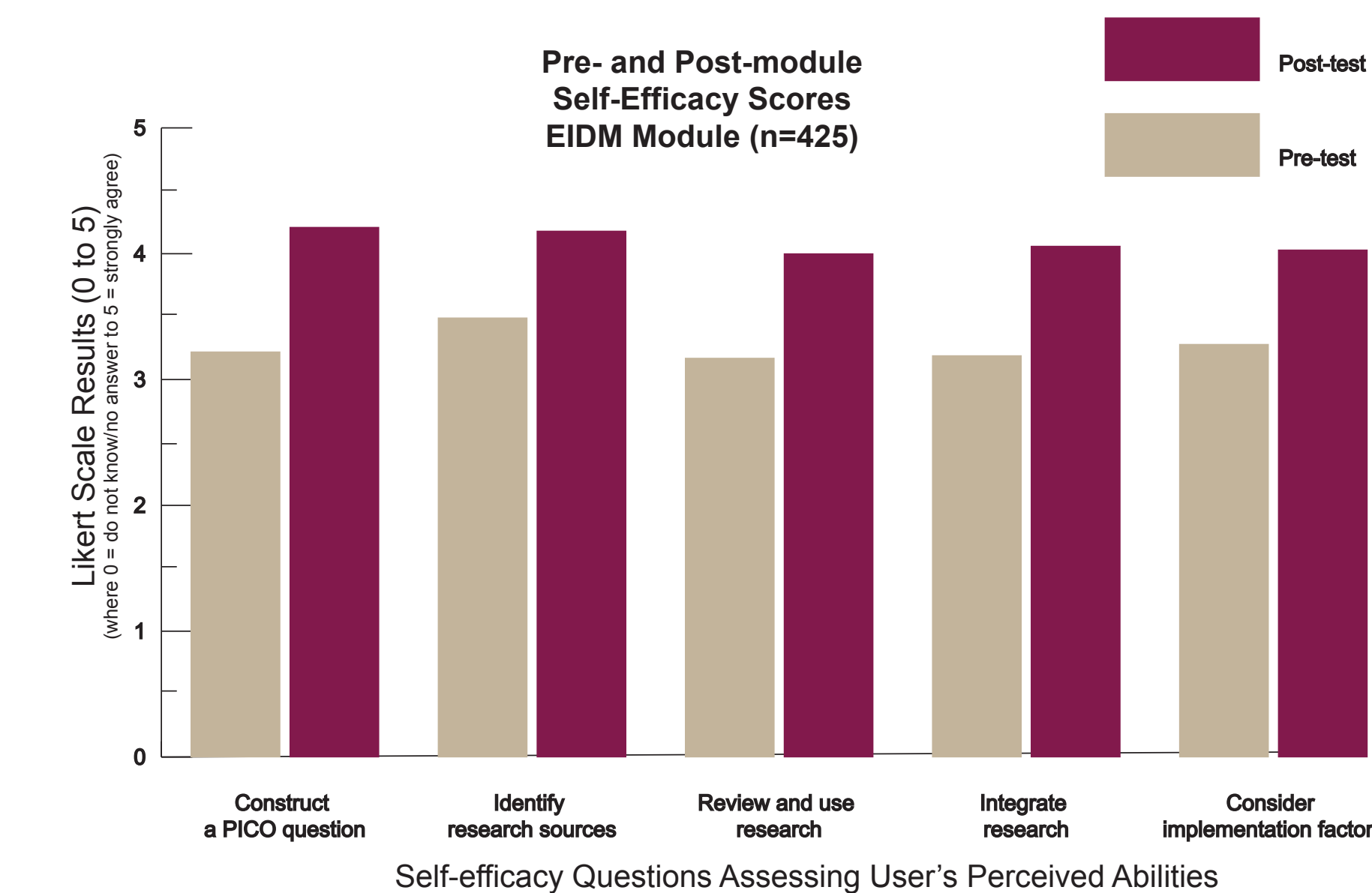


Figure 3: Pre and Post Self-Efficacy Scores for EIDM Module (n=425)

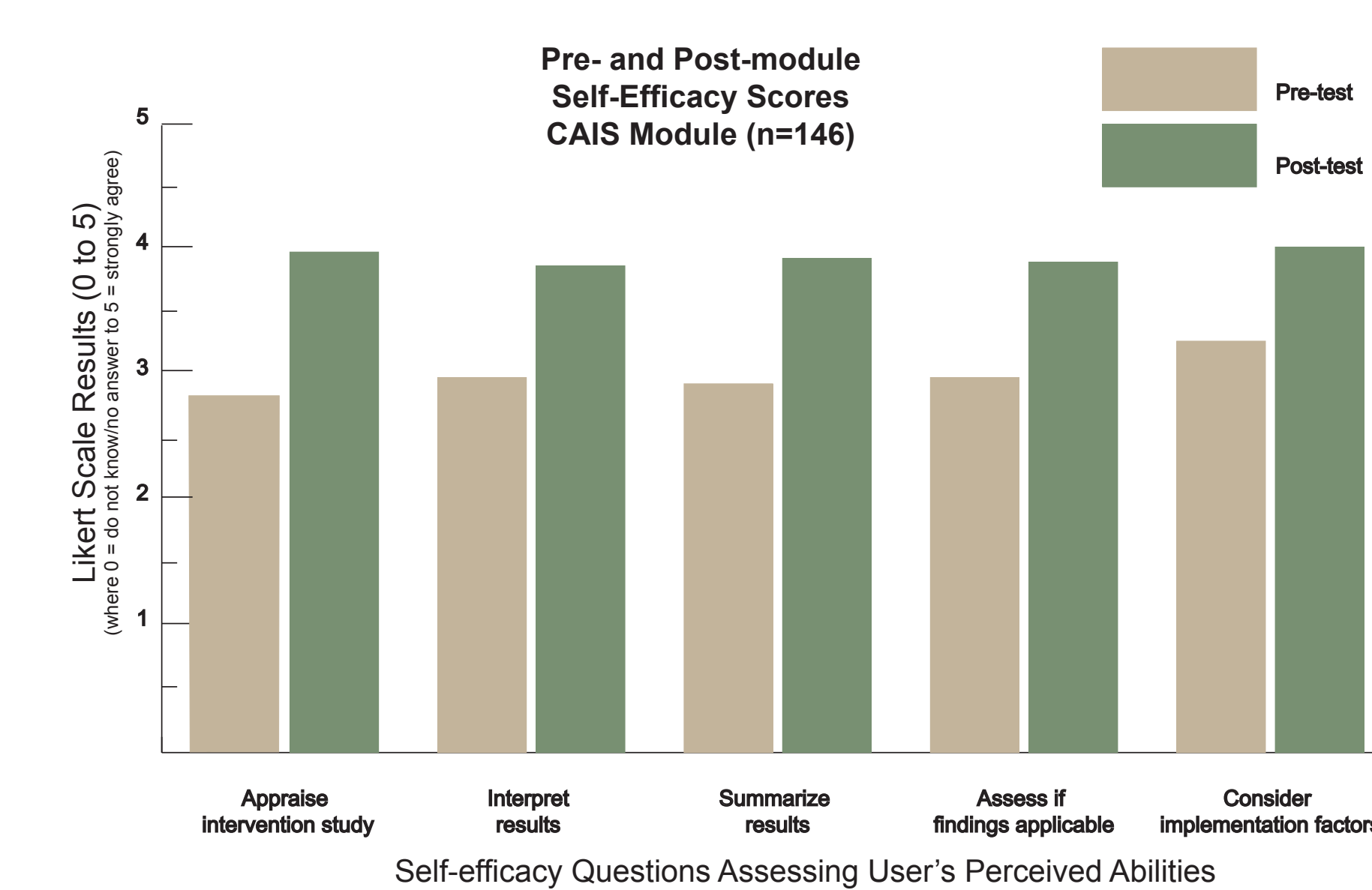


Figure 4: Pre and Post Self-Efficacy Scores for CAIS Module (n=146)

Content and Learning Strategies to Support Learner Needs (EIDM and CAIS modules):

Data from feedback forms on EIDM and CAIS modules provide information on how effective the online learning modules were in meeting users' learning needs. Using a Likert scale, ranging from 0 to 5 (where 0= do not know/no answer and 5 is strongly agree), respondents positively assessed both EIDM and CAIS modules on effectiveness of module content and learning strategies to support user learning. There were 136 users who completed feedback forms on the EIDM module (from a possible pool of 1759 users accessing the module; 7.73% response rate) and 39 users assessing the CAIS module (of 401 total users; 9.73% response rate). Mean scores are presented below in figure 5.

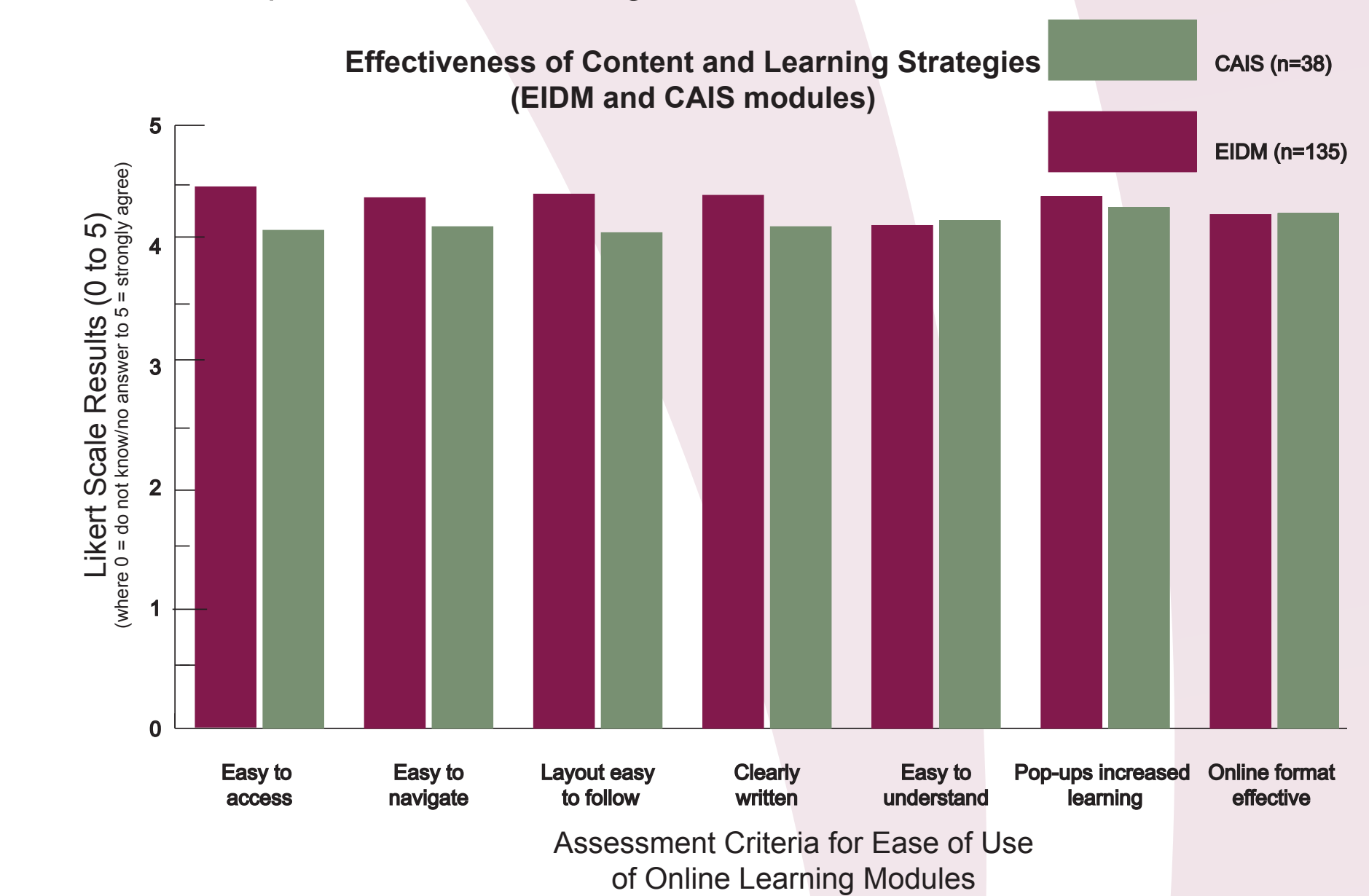


Figure 5: Mean Scores of Users' Rating of Effectiveness of Online Modules to Support Learning (EIDM Module, n=136 and CAIS Module, n=38)

Online Format and Module Design to Support Users' Learning (EIDM and CAIS modules):

Feedback forms from EIDM and CAIS online learning modules assess ease of use, a key facilitator to support users' learning. Using a Likert scale, ranging from 0 to 5 (where 0= do not know/no answer and 5 is strongly agree), respondents positively assessed the online learning modules with respect to ease of use. Data below includes 135 responses for the EIDM module feedback form (N=1759, 7.67% response rate) and 38 responses for the CAIS module feedback form (N=401, 9.47% response rate). Mean scores are presented in figure 6.

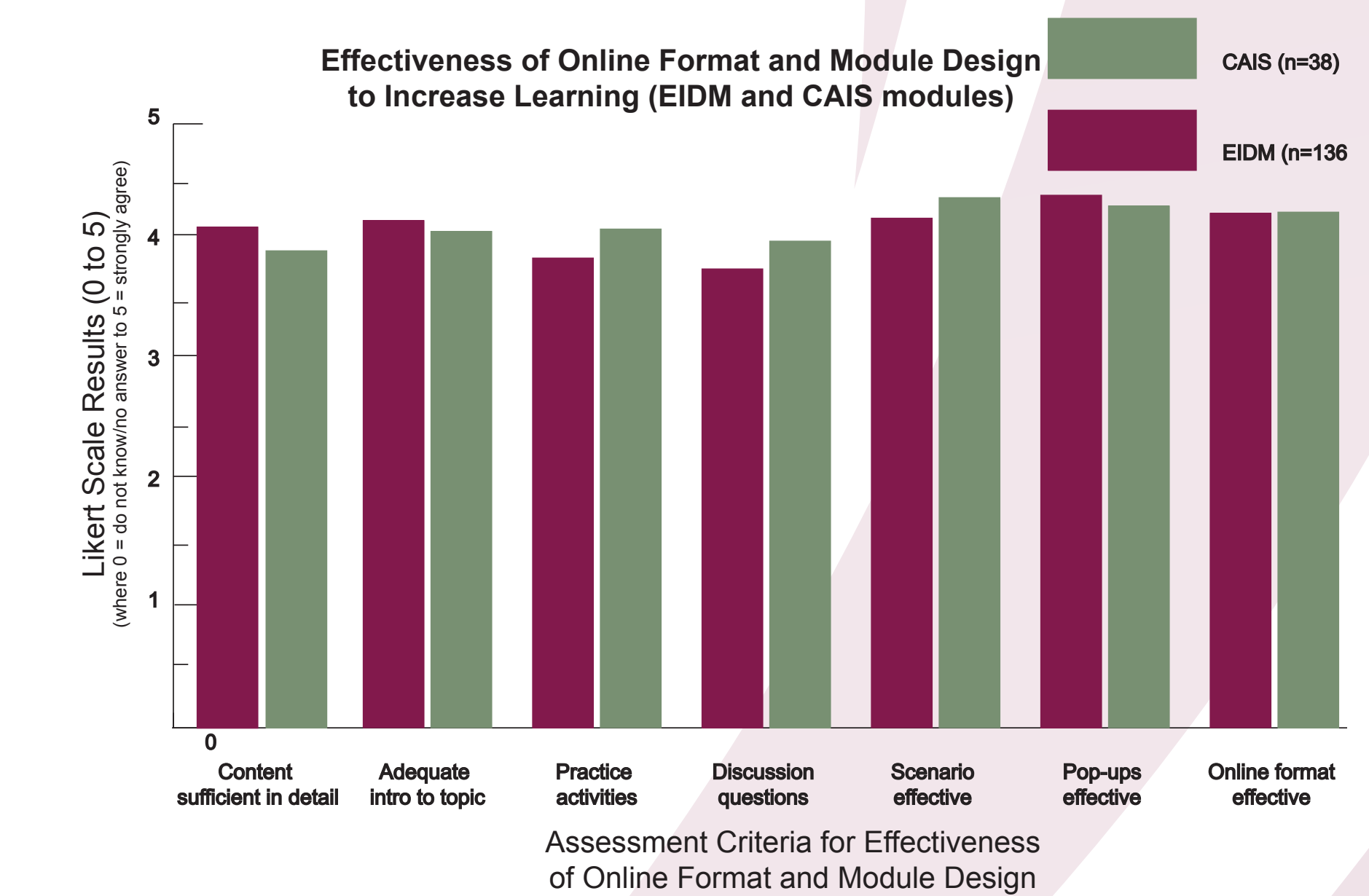


Figure 6: Mean Scores of Users' Rating of Ease of Use of Online Learning Modules to Support Learning (EIDM Module, n=135 and CAIS Module, n=38)

Impact of Online Modules on Learning Outcomes (QRD module):

Data from the QRD module (launched July, 2012) indicates the impact of online learning modules on users' knowledge. Data collected from July 2012 to February 2013 among users responding to a 15 multiple choice questions on both the pre-test and final test demonstrated an increase in knowledge of module content. Data is based on n=108 at both time points using a paired t test. Knowledge of module content increased significantly from pre-assessment (66.4% to final assessment (88.1%)) [21.7%, 95% CI (18.5% to 25%) P < 0.001]. (see figure 7)

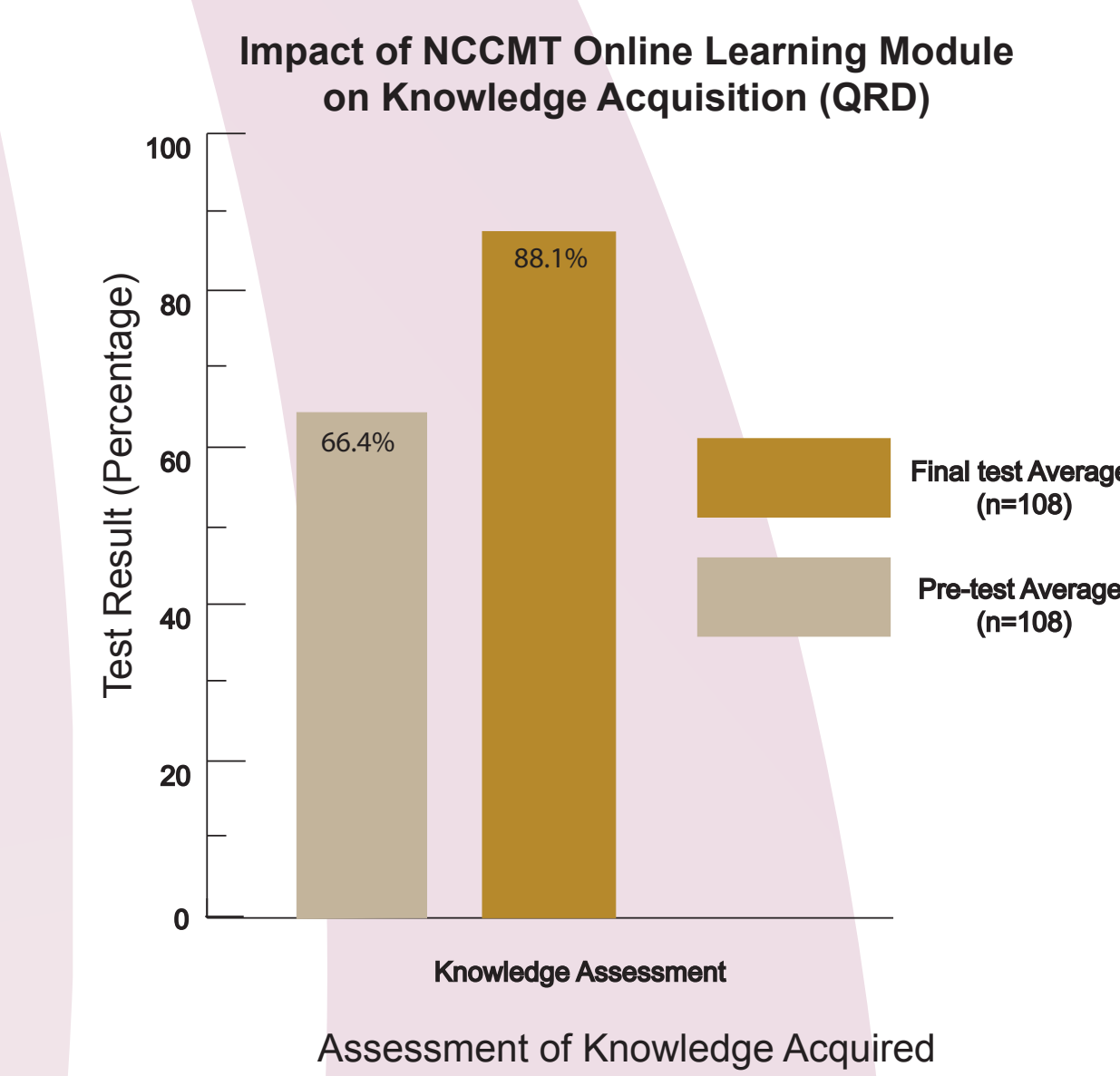


Figure 7: Data from Quantitative Research Designs Module 101 Assessing Impact of QRD Module on User Knowledge (n=108) from July 2012 to February 2013

Discussion:

Online learning may be a cost-effective strategy to build capacity for evidence-informed public health (EIPH) among public health professionals across Canada. Online learning is an effective strategy to build learners' perceived self-efficacy as it allows learners to practice new skills and build on newly acquired knowledge in a safe, self-paced learning environment. NCCMT's online learning modules created learning environments which facilitate learning and, ultimately, foster learner self-efficacy. Increasing perceived self-efficacy is a critical pre-cursor for knowledge and skill development (Hodges, 2008). Future evaluation of NCCMT's online learning modules will assess the extent to which online learning modules have influenced learner knowledge and skill.

About the National Collaborating Centre for Methods and Tools:

The National Collaborating Centre for Methods and Tools (NCCMT) provides leadership and expertise in knowledge translation for public health, working with public health professionals and organizations to strengthen public health through the use of research evidence. Our approach, evidence-informed public health (EIPH), is a systematic and comprehensive framework to guide students and practitioners in applying research evidence. EIPH is the process of distilling and disseminating the best available evidence from research, context and experience – and using that evidence to inform and improve public health practice and policy (Ciliska, Thomas & Buffet, 2008).

References:

Alexander, L.K., Horney, J.A., Markiewicz, M. & MacDonald, P. (2010). Ten guiding principles of a comprehensive internet-based public health preparedness training and education program. *Public Health Reports*, 125 (Suppl 5), 51-60.

Centers for Disease Control and Prevention (2013). CDC's E-learning Essentials: A guide for creating quality electronic learning. Atlanta, GA: Centers for Disease Control and Prevention. Available from: <http://www.cdc.gov/learning/qualityessentials.html>

Ciliska, D., Thomas, H. & Buffet, C. (2008). An Introduction to Evidence-Informed Public Health and A Compendium of Critical Appraisal Tools for Public Health Practice. Hamilton, ON: National Collaborating Centre for Methods and Tools. Available from: <http://www.nccmt.ca/eiph/index-eng.html>

DiCenso, A., Bayley, L. & Haynes, R.B. (2009a). Accessing pre-appraised evidence: fine-tuning the 5S model into a 6S model. *Evidence-Based Nursing*, 12(4), 99-101.

DiCenso, A., Bayley, L. & Haynes, R.B. (2009b). ACP Journal Club. Editorial: Accessing preappraised evidence: fine-tuning the 5S model into a 6S model. *Annals of Internal Medicine*, 151(6), JC3-2, JC3-3.

Hodges, C.B. (2008). Self-efficacy in the context of online learning environments: A review of the literature and directions for research. *Performance Improvement Quarterly*, 20(3-4), 7-25. Doi: 10.1002/piq.20001

Robson, P., Dobbins, M., DeCorby, K. & Tirilis, D. (2010). Facilitating access to pre-processed research evidence in public health. *BMC Public Health*, 10, 95. Doi: 10.1186/1471-2458-10-95

National Collaborating Centre for Methods and Tools

McMaster University
1685 Main Street West, Suite 302
Hamilton, ON L8S 1G5
Phone: 905-525-9140, ext 20450

www.nccmt.ca (English) or www.ccnmo.ca (French)

Funded by the Public Health Agency of Canada
Affiliated with McMaster University