A Systematic Map and Scoping Review of Soft Skill Assessment Instruments for College Students and Peer Mentoring Programs

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Abstract
Soft skills such as leadership, communication, and professionalism are essential for employment in agriculture and the related sciences, but recent graduates have failed to meet employers’ expectations in soft skill development. Peer mentoring and peer leadership programs have been proposed as one method to increase soft skill development. This study sought to catalog published soft skill assessment instruments and evaluate their relevance to college students and college student peer mentors. A systematic map of soft skill assessment instruments was developed from a multidisciplinary review of 3,200 peer reviewed journal articles from three databases. Forty-three instruments were identified to measure three soft skills valued by agricultural employers: leadership, communication, and professionalism. These instruments hold value for their utility in program evaluations, as pedagogical tools, or in program curriculum development. Recommendations for appropriate instruments to measure soft skill development in the context of college student peer mentoring and/or peer leadership programs were made based on a hierarchical assessment of psychometric evidence, generalized construct validity, composite relevance to college students and peer mentoring, lowest cost, and fewest questions. Results indicate a gap in the literature of instruments that are contextually situated in the college student peer mentoring experience.

Introduction
Colleges are responsible for preparing students to meet the challenges of the workforce. Employers of recent agricultural and natural resources graduates ranked soft skills as the most important area of preparedness for new graduates, ahead of disciplinary knowledge, technical skills, and project management skills (Crawford et al., 2011). However, recent graduates have failed to meet employers’ expectations in soft skill development (Association of American College and Universities, 2015; Robinson and Garton, 2008). Soft skills are the broad range of non-technical abilities, skills, and traits that are valued in the labor market (Robles, 2012). The Association of Public and Land-Grant Universities identified seven soft skill clusters that relate to success in newly hired graduates: leadership, decision making/problem solving, professionalism, team skills, communication, self-management, and hands on knowledge/experiences (Crawford et al., 2011). A student’s soft skill development can predict and causally produce success ( Heckman and Kautz, 2012). As a result, colleges of agriculture and related sciences are charged with graduating students who demonstrate high levels of technical acumen and interpersonal competence.

It has been shown that a college student’s peer group has perhaps the strongest effect on cognitive and affective development over any other single factor in higher education (Astin, 1996; Kram and Isabella, 1985). As a result, peer-led programming has been looked to as one method to positively impact soft skill development in future graduates. Over 75% of universities in the United States have peer mentoring or helping programs (Newton and Ender, 2010) that may be designed, in part, to support soft skill development in undergraduate students. Peer mentoring programs, in particular, have been shown to positively impact both mentors and
mentees. Peer mentors may perform duties across 15 categories of functions: support/encouragement, advice/guidance, access to resources, challenge/opportunity, clarify values/goals, coaching, information, protection, role model, social status, socialization/"host and guide", sponsorship/advocacy, conduit of knowledge, training/instruction, visibility/exposure (Jacobi, 1991). Mentees gain skills to overcome academic and psychosocial challenges, increasing their self-efficacy as a result of a mentoring relationship (Bean and Eaton, 2001; Bonin, 2013; Washburn, 2008). Mentors have been found to benefit socially, academically, and in the development of leadership skills (Astin, 1993; Kram and Isabella, 1985). Evidence suggests that peer mentoring programs can positively impact the soft skill development of both mentors and mentees.

Program evaluations and assessments of soft skill development allow peer mentoring program administrators to measure the impact of mentoring on both mentors and mentees and ensure programs are producing positive changes. These evaluations can serve to inform data-driven decisions related to program design, implementation, funding, and curriculum. There is a need for more methodologically sound evaluations of formal mentoring programs (Roger and Temblay, 2003; Jacobi, 1991), as the implementation of mentoring programs has historically outpaced studies of their impacts and efficacy (Crisp and Cruz, 2009) and evaluations have been narrowly focused on measuring academic outcomes as a result of mentoring (Hall and Jaugietis, 2011).

A large number of commercially and publicly available instruments exist to measure soft skills (Spitzberg, 2003). These instruments are generally theoretically sound and well tested and can be incorporated into a systematic program evaluation. Their use requires less time input than developing a novel instrument for a program evaluation or skill assessment. Because so many instruments exist, there is a need to specifically evaluate the utility and relevance of these instruments in the context of a college student peer mentoring program evaluation, and for college students in general.

Systematic maps were developed in the social sciences to “reliably catalogue evidence on a specific subject” (Haddaway et al., 2016, p. 613) in the form of searchable databases and detailed descriptive information. These maps synthesize extant literature in an objective, transparent, and repeatable way that minimizes the selection, publication, and detection bias of traditional literature reviews (Pullin and Stewart, 2006). Findings from systematic maps hold implications for best practice development by policy makers, researchers, and practitioners. Scoping reviews provide a broad understanding of the literature to inform a systematic map. Scoping reviews differ from systematic reviews, which aim to answer a specific question through assessment of existing literature (Haddaway et al., 2016). Scoping reviews are used to identify primary and secondary research, summarize the extent and nature of research activity on a broad topic, and identify future areas of research (O’Flaherty and Phillips, 2015). In concert, systematic maps and scoping reviews provide a broad, objective understanding of the literature.

The objectives of this study were to:

- Identify psychometrically sound assessments of leadership, communication, and professionalism;
- Assess and evaluate the relevance of identified instruments in measuring soft skill development of (a) peer mentors and mentees and (b) college students.

Materials and Methods

Phase I: Scoping Review to Identify Instruments

Definitions of key constructs were developed based, in large part, on the descriptions of soft skills generated by agricultural employers in Crawford et al. (2011).

- Leadership: a values-based, non-positional process to purposefully affect change or reach a goal. Leadership consists of skills, behaviors, and processes that demonstrate a person’s ability to see the big picture and strategically work with and empower others. Leaders motivate others, know when to step up or step aside, and celebrate the contributions of others.
- Communication: a set of skills that includes effective listening to produce concise, accurate, professional, and pleasant oral and written messages in various settings including public speaking, group discussions, reports, and emails.
- Professionalism: the general ability to form effective relationships with constituencies, accept and apply constructive feedback for improvement, and have a clear understanding of one’s role in a professional setting. Professionalism can be understood as the broader set of skills, demeanor, and decorum expected of an employee. Professionalism can be demonstrated in a workplace, an organization, a classroom, or in non-formal interactions with a person.

The multidisciplinary scoping review and systematic map followed an adapted version of the methodological framework developed by James et al. (2016). This study was deemed exempt under federal regulation 45 CFR §46.101. Database searches were performed between January and April 2017 using eight search terms developed to locate peer reviewed journal articles related to each of the identified variables. Search terms consisted of one paired set of variable and descriptor, combined to create 32 unique search terms (Table 1).

Searches were conducted through Google Scholar and WorldCat, a search that indexes seven databases: Academic OneFile, Academic Search Complete, Directory of Open Access Journals, MasterFILE Complete, Newspaper Source Plus, OAIste, and WorldCat.org. Each search term was individually entered into the two search engines, and the first 50 articles returned for
Phase II: Collection of Relevant Background Data

After all 64 searches had been performed, the researchers sought out electronically accessible, published copies of questionnaires, scales, and survey instruments and associated background literature for all instruments identified in phase one. Background literature, including reports of psychometrics and detailed instrument information based on the variables identified by Huber et al. (2000), was gathered through directed searches for specific information with Google Scholar, WorldCat, ERIC (EBESCO), other electric journal search engines provided by Ohio State University Libraries, and publishers’ websites. Twenty-two data points of general information, psychometrics, and utility were recorded for each instrument. Authors and publishers were contacted directly via email when copies of instruments or key information could not be located. Follow up emails were sent to non-respondents 10 days later. Notes were recorded if authors or publishers were unable to provide free sample questions, instruments, or key information one week following the second email.

Phase III: Determination of Instrument Eligibility and Development of a Systematic Map

As background data were gathered, instruments were compared against a standardized list of exclusion criteria. Two reviewers independently assessed the titles, abstracts, articles, instruments, and reference lists of the studies retrieved by the literature search to determine if the instrument met the criteria for exclusion from the sample. Instruments were excluded from the sample if any of the following were true:

- The instrument under consideration failed to measure all, or part of, the specific construct previously defined.
- Key background information could not be located through the literature, author’s or publisher’s website, or provided directly by the author or publisher via email with reasonable effort and in a reasonable amount of time.
- The instrument was published prior to 1980. This date was selected to reflect the broader shift towards post-industrial leadership paradigms in 1978 (Outcalt et al., 2001).
- The instrument was not published in or could not be easily obtained in English.
- The instrument was specifically developed for audiences outside of the United States. While “global” instruments were included, instruments designed to reflect a specific culture and normalized for international audiences were excluded.
- More than 10% of the questions in the instrument bore no relevance to either (a) peer mentors or (b) college students in general. The words being used to describe relationships and actions would not make sense and would be actively confusing to either peer mentors or college students, as indicated with a rating of “0” in either “Relevance to College Students” or “Relevance to Peer Mentors.” For example, instruments that explicitly use language centered on doctor/patient roles were excluded, while instruments developed and tested in clinical settings that did not have explicit language about doctor and patient roles were included.
- The instrument was not intended for use as a paper or electronic survey instrument. Interview guides, checklists, observational sheets, or other instruments to assess soft skills through direct participant observation were not included in the analysis.

The above criteria for exclusion were developed based on Levas et al. (2010) recommendations for scoping study methodology. Three reviewers rated each included instrument for its relevance to peer mentors/mentee and college students on a four-point scale, 0-3 (Table 2). Each rater was trained on scoring guidelines and given a standardized codebook (Brown et al., 2013) for instrument assessment with detailed instructions for data recording and interpretation. Calibration tests were performed on three separate occasions to establish inter-rater reliability. Audits were performed to ensure compliance with the standardized codebook. Composite relevance scores were obtained by adding the instrument’s score for relevance to peer mentors/mentees and relevance to college students.

Phase IV: Instrument Evaluation

Three top-ranked instruments for each variable were determined using a hierarchical scoring checklist...
A Systematic Map and Scoping

This checklist represents a general list of key considerations of program administrators in selecting an instrument to assess or evaluate student development. It does not reflect all possible considerations that go into making such a decision. Practitioners conducting a program evaluation should critically analyze the relevance of these criteria to their evaluation needs, as these instruments are not universally applicable to all peer mentoring programs.

Results and Discussion

The articles returned in Phase I could be broadly categorized into studies that (a) utilized an instrument to collect data or (b) reported on the development or testing of a new or established instrument. Phase one identified 63 communication instruments, 72 leadership instruments, and 29 professionalism instruments from approximately 410 publications. However, the initial assessment of the 29 professionalism instruments revealed that none of these measured the previously established definition. Instruments that did measure professionalism as defined tended to be disciplinary-specific for medical or teaching fields and were excluded from the sample because of their lack of relevance to peer mentoring or college students (Figure 1). Reevaluation of the related literature revealed that the definition of professionalism developed based on Crawford et al. (2011) was more closely measured by employability instruments, which assess “a set of achievements – skills, understandings and personal attributes – that make graduates more likely to gain employment and be successful in their chosen occupations” (Knight and Yorke, 2004, p. 22). Phase one was repeated with employability search terms (Table 1) and resulted in the preliminary identification of 26 instruments from 64 additional publications.

Twenty-two data points of general information, psychometrics, and utility were recorded for each instrument. All instruments were assessed against a standardized list of criteria (Figure 1). Of the publications that were excluded for not being relevant to peer mentoring or college students, 81 were exclusive to healthcare, 54 exclusive to individuals with disabilities and traumatic injuries, and 25 exclusive to teaching and primary/secondary school context. For measures of leadership and communication, 33 publications were found to be exclusive to the workplace and were also excluded. Duplicates were screened out, resulting in the inclusion of 43 instruments, scales, questionnaires, or surveys in the final systematic map. A database of all included instruments across all 22 data points can be accessed in Murray (2017).

Instruments were evaluated against a practitioner-developed checklist (Figure 1) for instrument selection to determine the top three recommended instruments for each variable (Table 3). This checklist included a composite score of an instrument’s relevance to mentoring and relevance to college students (max score: 6).
Communication

Sixteen communication instruments were included in the systematic map (Murray, 2017). Of the 16, none were found to have any associated cost for research use at the time of inquiry. Instrument length ranged from 5 to 200+ questions. Seventy-five percent were specifically developed with or intended for use with college students, and all had published accounts of development and testing, including validity and reliability testing. While some instruments focused on sub-skills of communication, such as intercultural communication, conflict communication, or willingness to communicate, most assessed multiple aspects of communication. The 16 instruments scored between 1-2 in relevance to mentoring role, and between 1-3 in relevance to college students (Figure 2).

The top three recommended instruments for measuring communication in college student peer mentors are:

1. Personal Report of Communication Apprehension (PRCA-24), which measures communication in four settings: groups, meetings, dyadic conversations, and public speaking (McCroskey et al., 1985). The PRCA-24 provides one of the most holistic measures of communication for college student or general use.
2. Self-Rated Competence (SRC), which assesses one’s perception of their conversational partner’s and their own communication competence (Cupach and Spitzberg, 1981). This instrument offers a 360° perspective on student communication following a partnered conversation.
3. Student Communication Motives Scale (SCMS), which assesses students’ motives for communicating with instructors (Martin et al., 2000). This instrument is particularly well suited for peer mentors that are embedded in academic or first year experience classes, or function as supplemental instruction providers or tutors.

Leadership

Twenty-three leadership instruments were included in the systematic map (Murray, 2017). Price per instrument ranged from $0 to $225, and instrument length ranged from 7 to 100 questions. Leadership instruments were more likely to be published commercially, require payment or membership, and offer external online data collection and management. The 23 instruments scored between 1-3 in both relevance to mentoring role and between college students (Figure 3).

The top three recommended instruments for measuring leadership in college student peer mentors are:

1. Servant Leadership Behavior Scale (SLBS) measures six domains of servant leadership:

Table 3. Top Three Recommended Instruments to Measure Communication, Leadership, and Professionalism/Employability

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Relevance to Mentoring</th>
<th>Relevance to College Students</th>
<th>Cost</th>
<th>Number of Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal Report of Communication Apprehension-24</td>
<td>2</td>
<td>2</td>
<td>$0</td>
<td>24</td>
</tr>
<tr>
<td>Self-Rated Competence</td>
<td>2</td>
<td>2</td>
<td>$0</td>
<td>28</td>
</tr>
<tr>
<td>Student Communication Motives Scale</td>
<td>1</td>
<td>3</td>
<td>$0</td>
<td>30</td>
</tr>
<tr>
<td>Servant Leadership Behavior Scale</td>
<td>3</td>
<td>1</td>
<td>$0</td>
<td>35</td>
</tr>
<tr>
<td>Multifactor Leadership Questionnaire-5X</td>
<td>2</td>
<td>2</td>
<td>$2.50z</td>
<td>45</td>
</tr>
<tr>
<td>Leadership Practices Inventory</td>
<td>1</td>
<td>3</td>
<td>$7.00z</td>
<td>30</td>
</tr>
<tr>
<td>Career Adapt-abilities Scale</td>
<td>1</td>
<td>3</td>
<td>$0</td>
<td>24</td>
</tr>
<tr>
<td>Dispositional Measure of Employability</td>
<td>2</td>
<td>1</td>
<td>$0</td>
<td>25</td>
</tr>
<tr>
<td>Occupational Work Ethic Inventory</td>
<td>1</td>
<td>2</td>
<td>$0</td>
<td>50</td>
</tr>
</tbody>
</table>

*z* indicates cost varies based on version, intended use, population, and quantity.
voluntary subordination, authentic self, covenantal relationship, responsible morality, transcendental spirituality, and transforming influence (Sedjaya et al., 2008).

2. Multifactor Leadership Questionnaire (MLQ) assesses transformational and transactional leadership behaviors, including nine factors in the Full Range Leadership Model (Bass and Avolio, 1997).

3. Leadership Practices Inventory (LPI) assesses leadership behaviors related to five leadership practices: modeling the way, inspiring a shared vision, challenging the process, enabling others to act, and encouraging the heart (Kouzes and Posner, 2003).

**Professionalism (Employability)**

Four employability instruments were included in the systematic map as measures of professionalism (Murray, 2017). None had associated costs, membership or training requirements, or offered multi-rater or other-rater versions of the instrument. Each had published accounts of development and testing. The four instruments scored between 1-2 in relevance to mentoring role, and 1-3 in relevance to college students (Figure 4). Because employability and professionalism relate to the workplace, instruments were not excluded for using workplace language (see Figure 1 for a list of criteria for exclusion). However, instruments that used language referencing future employability were prioritized over those that measured behaviors exhibited during a present employment.

The top three recommended instruments for measuring leadership in college student peer mentors are:

1. Career Adap-Abilities Scale (CAAS) measures career adaptabilities according to career construction theory. The instrument includes four scales: concern, control, curiosity, and confidence (Savickas and Porfeli, 2012).

2. Dispositional Measure of Employability (DME) assesses dispositional employability, or the individual differences related to adapting to work and career environments (Fugate and Kinicki, 2008).

3. Occupational Work Ethic Inventory (OWEI) measures employability skills in three areas: interpersonal skills, initiative, and dependability based on the workforce development model (Hill and Petty, 1995).

**Conclusions and Recommendations**

Systematic maps allow for the identification of gluts and gaps in research literature on a broad topic (Haddaway et al., 2016). Forty-three instruments were found to be suitable to measure communication, leadership, and professionalism in college student peer mentors and mentees and were summarized in a systematic map (Murray, 2017). Most contextually relevant instruments measured leadership and communication. The systematic map indicated a gap in the literature of professionalism instruments that were relevant to either/both peer mentors and college students. In particular, there is a need for research on instruments that directly measure professionalism in students of agriculture and related sciences. These instruments would allow peer mentoring programs and leadership programs to measure the professional development of students in their programs, providing important data for communication to stakeholders and funding units.

Recommended instruments were identified for all three soft skills. However, none of the 43 identified instruments were rated a composite score of six, which would indicate an instrument that is highly relevant to both mentoring and college students (Table 2). Given the proliferation of peer mentoring programs across the United States, there is a need for instruments that are contextually situated in the college student peer mentoring experience. Novel instruments should be developed that specifically measure these soft skills for college student peer mentors to assess program efficacy and communicate program results to internal and external stakeholders, including prospective employers.

Leadership instruments were the most likely to be published commercially and offer external online data collection and management systems for researchers and practitioners. Publishers of communication and professionalism instruments can look towards the leadership literature for robust models of instrument dissemination, indexing, publication, and commercialization. Doing so may result in the more frequent utilization of these instruments, and the development of new instruments to measure college student communication abilities.

The recommendations of this study are limited by its scope, which included only instruments referenced...
in the first 3,200 articles. Instruments and articles that were not indexed or returned by the eight electronic databases were not considered for inclusion. The scoping review was confined to peer reviewed journal articles, which may have excluded practitioner’s tools that may be appropriate pedagogical and assessment tools. Additional scoping reviews and systematic maps should be constructed using additional scholarly databases and non-scholarly search engines. Further scoping reviews and systematic maps should be undertaken to assess the state of the literature related to the other variables identified by Crawford et al. (2011) – decision making/problem solving, self-management, hands on knowledges/experiences, and team skills. These additional maps could build upon the maps presented herein, providing a more complete analysis of the literature for assessment decision-making.

**Summary**

Recommendations for appropriate instruments to measure soft skill development were made based on a hierarchical assessment of psychometric evidence, generalized construct validity, composite relevance to college students and peer mentoring, lowest cost, and fewest questions. Communication in college student peer mentors and mentees can be measured with the Personal Report of Communication Apprehension, the Self-Rated Competence, or the Student Communication Motives Scale. Leadership can be measured with the Servant Leadership Behavior Scale, the Multifactor Leadership Questionnaire, or the Leadership Practices Inventory. Professionalism or employability can be measured with the Career Adapt Abilities Scale, the Dispositional Measure of Employability, or the Occupational Work Ethic Inventory. While multiple, suitable instruments exist to measure soft skill development, none were found to be highly relevant to both peer mentoring programs and college students in general. There is a need for instruments that are contextually relevant to college student peer mentors and mentees. Future scoping reviews and systematic maps are recommended to map instruments published or indexed in other databases, including non-scholarly databases.

**Literature Cited**


A Systematic Map and Scoping


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