

University of Denver

Digital Commons @ DU

Research Methods and Statistics: Faculty
Scholarship

Research Methods and Statistics

6-2011

Development of a National Survey to Assess Student Learning Outcomes of Community-Based Research

Gary Lichtenstein
Stanford University

Trisha Thorme
Princeton University

Nicholas J. Cutforth
University of Denver, nicholas.cutforth@du.edu

Martin L. Tombari
Quality Evaluation Designs

Follow this and additional works at: https://digitalcommons.du.edu/rms_faculty



Part of the [Community-Based Research Commons](#)

Recommended Citation

Lichtenstein, G., Thorme, T., Cutforth, N., & Tombari, M. L. (2011). Development of a National Survey to Assess Student Learning Outcomes of Community-Based Research. *Journal of Higher Education Outreach and Engagement*, 15(2).



This work is licensed under a [Creative Commons Attribution 4.0 International License](#).

This Article is brought to you for free and open access by the Research Methods and Statistics at Digital Commons @ DU. It has been accepted for inclusion in Research Methods and Statistics: Faculty Scholarship by an authorized administrator of Digital Commons @ DU. For more information, please contact jennifer.cox@du.edu, dig-commons@du.edu.

Development of a National Survey to Assess Student Learning Outcomes of Community-Based Research

Comments

Originally published by University of Georgia in the *Journal of Higher Education Outreach and Engagement*.

[View published version.](#)

Publication Statement

Copyright held by the author or publisher. User is responsible for all copyright compliance.

Publication Statement

Copyright held by the author or publisher. User is responsible for all copyright compliance.

Development of a National Survey to Assess Student Learning Outcomes of Community-Based Research

Gary Lichtenstein, Trisha Thorme,
Nick Cutforth, and Martin L. Tombari

Abstract

With the goal of codifying student learning outcomes of community-based research (CBR), the authors created a conceptually valid and statistically reliable CBR Student Learning Outcomes Survey. The project began with individual interviews and focus groups with 70 undergraduates and faculty at six colleges and universities nationwide discussing perceived benefits of CBR. Based on analyses of these interviews, five CBR outcome constructs were derived: academic skills, educational experience, civic engagement, professional skills, and personal growth. The survey was piloted online in spring 2009 to students who had experienced CBR from 15 colleges and universities ($N = 166$). Factor analyses revealed strong statistical reliability across survey constructs. The authors invite faculty to use the instrument to assess CBR courses and invite students who have experienced CBR to complete the survey online through spring 2012, as part of a national study of CBR outcomes.

Introduction

As more colleges and universities have integrated experiential learning programs into their curricula, there has been an increase in research focused on identifying learning outcomes of such programs. Studies have identified a range of outcomes related to undergraduate students' participation in service-learning and, to a lesser extent, community-based research (CBR), including increased engagement with academic studies, development of professional skills, and civic engagement.

Although learning outcomes of service-learning and CBR are similar, CBR may have greater strengths in terms of academic engagement and deepening one's understanding of one's major, because identifying research questions and collecting data related to them develops and reinforces disciplinary knowledge in ways that service-learning may not. The overarching goal of the current research is to assess the effectiveness of CBR, begin to identify best practices, and examine the effects of various practices, based on diverse academic factors.

Several constituencies stand to benefit from the systematic assessment of CBR's impact on students. Institutions of higher education will be able to show the extent to which CBR courses are contributing to their institutions' missions and to students'

“Studies have identified a range of outcomes related to undergraduate students’ participation in...community-based research (CBR), including increased engagement with academic studies, development of professional skills, and civic engagement.”

learning and career preparation. Faculty members will understand the impact of their CBR courses on student learning, and will be able to use data to improve their teaching, while also advocating for CBR as a rigorous pedagogy to colleagues. Students will be aware of the contribution of CBR to their learning experience. Finally, community partners will better recognize how their participation in CBR provides critical benefits to students (Gelmon, Holland, Driscoll, Spring, & Kerrigan, 2001).

As a first step toward codifying the effectiveness of CBR, the authors developed an evidenced-based, conceptually

reliable, and statistically valid survey instrument with the potential to quantify student learning outcomes of CBR classes. This article describes the development of the survey instrument. Constructs were based on extensive student and faculty interviews. The five scales that constitute the instrument reliably assess five commonly discussed dimensions of student learning related to service-learning and CBR: development of academic skills, enhanced educational experience, increased civic engagement, development of professional skills, and personal growth.

Literature Review

Outcomes of Service-Learning

Throughout the research literature, proponents of service-learning express enthusiasm about the benefits to students at the college level (Coffey, 2010; Ghannam, 2007; Hart, 2006; Sherman & MacDonald, 2009). However, questions about the cognitive and affective benefits compared to direct instruction, a lack of clarity

about the politics and goals of service-learning, and the challenges of integrating service-learning experiences into the curriculum have led to caution in adopting this form of experiential learning (Eyler, 2000; Polanyi & Cockburn, 2003; Westheimer & Kahne, 2004).

Advocates of experiential learning have urged researchers to document student learning outcomes through the use of multiple methodologies and presentation of solid evidence, in order to provide a basis for replication and further research (Gelmon et al., 2001; Mehaffy, 2009). At the same time, researchers identify challenges in assessing service-learning outcomes (Keen, 2009; Marullo et al., 2003; Pike, 2009). One challenge is that service-learning can take many different forms (e.g., voluntary or mandatory, integrated into coursework or not, involving reflection or not). In addition, service-learning can be studied at many different levels—including effects on students, faculty, community partners, and institutions themselves (Keen, 2009). Even when a specific outcome is identified—for example, civic engagement—the concept can be defined very differently across different instruments, making it difficult to link studies that share similar outcome variables (Keen, 2009; Prentice & Robinson, 2007). Development of academic skills is often cited as a benefit of service-learning (e.g., David, 2009; Higher Education Research Institute, 2002; Vogelgesang & Astin, 2000), but what, exactly, constitutes “academic skills”? In the case of the student who says that service-learning has made her “more comfortable speaking up in class,” do the authors see this as development of an academic skill, social skill, professional skill, or personal growth? Becoming more comfortable sharing one’s perspectives in public settings could be an example of development in all four areas. This illustrates some of the challenge in codifying outcomes of CBR.

Generalizing results of studies also can be difficult, since many published articles looking at student outcomes of service-learning do not distinguish between different delivery types (e.g., courses with a service-learning component versus courses dedicated to service-learning versus service-learning as a cocurricular activity). For example, studies have shown that outcomes of service-learning are enhanced when the service-learning includes a reflection component, or when faculty integrate the service-learning experience into class discussion, but whether such components were part of students’ experience is not always assessed (Conway, Amel, & Gerwein, 2009; Hunter & Brisbin, 2000). Therefore, while studies of student learning outcomes often focus on students’ self-reported changes on variables such as academic skills, civic engagement, and professional skills, such studies often raise

questions about the mechanisms by which students participating in service-learning experienced these benefits (Gelmon et al., 2001; Higher Education Research Institute, 2002).

Although the reported benefits of service-learning are compelling, most studies of service-learning outcomes are not conducted with control populations. It is not always clear whether the benefits of service-learning outweigh the effort of implementing it, or what curricular trade-offs result, if any. In studies with control groups or that compare service-learning with non-service-learning alternatives, results are often mixed (Billig, Root, & Jesse, 2005; Deeley, 2010; Frumkin et al., 2009; Hunter & Brisbin, 2000; Phelps & Dostilio, 2008; Prentice & Robinson, 2007).

Outcomes of Community-Based Research

Often seen as a unique subspecies of service-learning, community-based research (CBR) shares critical characteristics of service-learning, but also has special features that may influence student outcomes differently (Strand, Marullo, Cutforth, Stoecker, & Donohue, 2003). Most particularly, CBR tends to be discipline-specific, and therefore has the potential for direct impact on a student's perception of his or her academic major. Because of the disciplinary nature of CBR, CBR is more likely to be delivered within the curriculum rather than as a cocurricular activity, since study design, data collection, analysis, and reporting are objectives commonly integrated into academic courses (Strand et al., 2003).

“As more CBR experiences and programs become integrated into college and university curricula, it becomes increasingly possible and important to identify...the extent to which [various] features affect student learning outcomes.”

disciplinary nature of CBR, CBR is more likely to be delivered within the curriculum rather than as a cocurricular activity, since study design, data collection, analysis, and reporting are objectives commonly integrated into academic courses (Strand et al., 2003).

To date, CBR has not been studied nearly as extensively as has service-learning. A July 2010 ERIC search of *service-learning* and *outcomes* yielded 384 results, while a search of *community-based research* and *outcomes* yielded six. As more CBR experiences and programs become integrated into college and university curricula, it becomes

increasingly possible and important to identify features of program delivery (e.g., whether the course is a stand-alone CBR course or

CBR is a component of a regular course), how the CBR experiences are structured and delivered (e.g., whether reflection activities are built into the experiences, whether final products are produced, and whether final products, if produced, are shared in classes and/or with community partners), and the extent to which these and other features affect student learning outcomes.

Nearly all published discussions of CBR student outcomes are case studies (e.g., Willis, Peresie, Waldref, & Stockman, 2003; Puma, Bennett, Cutforth, Tombari, & Stein, 2009). Although the results are compelling, such studies make it difficult to generalize results beyond the specific experiences described. The authors found only one study that used a survey to assess CBR outcomes (Lewis & Niesenbaum, 2005), yet even this study conflates CBR and service-learning. In fact, the authors were unaware of a survey instrument that assesses CBR specifically along several dimensions of student learning outcomes familiar in the literature on service-learning, using conceptually valid and statistically reliable scales, and that can be implemented across institutions.

The instrument reviewed in this article seeks to fill this gap. The authors believe that the CBR Student Learning Outcomes Survey has the potential to assess learning outcomes at student, course, and institutional levels, providing a common means of evaluating CBR that can focus research efforts across institutions and help identify specific strengths of CBR, including program features that enhance students' experiences.

Survey Development

Identifying Potential Outcomes and Creating Constructs

IRB approval was secured prior to the study. During 2007–2008, Cutforth visited six institutions with active CBR programs. He conducted over 30 individual and focus group interviews with undergraduate students who had experienced CBR. Altogether, over 70 students were interviewed. Respondents were undergraduate students from a wide range of majors, including the natural and physical sciences, social sciences, humanities, psychology, and business. The interviews allowed Cutforth to gain insights into the context in which the students' CBR experience was taking place, including interactions in the classroom and community; how students encountered issues of race, class, gender, and other differences in their communities; and their recommendations for

improving the quality of CBR courses. Students provided varied and specific examples of their CBR experiences, and discussed and reflected upon the short- and long-term benefits they had experienced, as well as challenges. Each discussion lasted from 30 to 60 minutes. Interview questions focused on the extent to which students' CBR experiences contributed to their personal, social, and cognitive development, as well as the extent to which their experiences influenced their thinking about future coursework and career choices.

Each interview was digitally recorded, transcribed, and analyzed. Using the constant comparison technique (Boeije, 2002), five themes were identified. The themes became constructs that constitute the framework of the CBR survey: *development of academic skills, enhanced educational experience, increased civic engagement, development of professional skills, and personal growth*. Each of these constructs is defined and discussed below. Table 1 summarizes the construct definitions.

Table 1. CBR Learning Outcome Survey Constructs and Definitions

Construct	Definition
Academic skills	Cognitive skills related to academic learning
Educational experience	Affective outcomes that enhance the overall college experience, including finding one's passion, enhancing one's interest in one's major, and clarifying a career path
Civic engagement	Cognitive, affective, and behavioral outcomes related to community participation
Professional skills	Skills, behaviors, and attitudes that enhance efficacy in the workplace
Personal growth	Affective outcomes related to understanding oneself, including personal insights and transformation

Academic Skills. *Academic skills* pertains to cognitive skills related to academic learning. Many student comments in the interview phase of the study highlighted the value of CBR in strengthening academic skills. Examples are

- I remember more facts because it is something that you actually witness.
- [Because of my CBR experience,] I know how to write an opening, a background section, a methodology, an analysis, and [a] conclusion.

- I revised my survey for my community partner about 15 times so that has gotten me way ahead of working on my thesis survey. . . . I know what works, what doesn't, what people are hesitant to answer, how to phrase things.

Educational Experience. Whereas *academic skills* focuses on cognitive outcomes related to coursework, *educational experience* focuses on affective outcomes that enhance the overall college experience, including finding one's passion, enhancing one's interest in one's major, and/or clarifying a career path. Several students commented on how CBR broadened and deepened their college experience:

- Once the authors had the patterns and themes and fitted them together, I found that [research] was something that I did enjoy. It made my mind happy.
- Research is something that could interest me in a way that I had not thought of [because] of my narrow definition of research.
- I feel like you are doing research for a purpose. You are not just doing it for the sake of a grade or test; you are doing it because someone can actually use what you are doing. So it pushes you further to want to do the research.
- Do I want to be in the field, hands on doing something; or do I want to be in the background doing research and that sort of thing? . . . [CBR] is feeling out what is right for you, what you can deal with and what you can't.
- CBR gives me an idea of the different things that I could do with my major, doing program evaluations, or research for people under a grant.

Civic Engagement. *Civic engagement* is often touted as a benefit of service-learning and community-based research. In the CBR outcomes survey, civic engagement includes cognitive, affective, and behavioral outcomes related to community participation. Four items make up the civic engagement scale, which probes understanding those who are different from oneself, clarifying one's values, and assessing one's likelihood

of voting. Throughout our interviews, students commented frequently on the impact of CBR on their civic engagement.

- CBR gave me a better sense of the community. We get so zoned into what is happening on campus and you kind of forget that you are in a larger city and there is life outside. . .
- One of the hardest things was the sheer emotion of the things that I experienced. Seeing people in situations different from my own: the kids who are hungry or sick or have never been to the dentist. . . .
- I feel that my background and how I look as the rich white person, my background is very privileged. When I look into the future, I would love to be working with a more diverse group and not stick out like a sore thumb and have to earn people's trust.
- CBR gave me a different perspective on people in general. It is hard to explain, but it changes you talking to people and seeing the difficulties that they face and how they have been able to overcome them or how they have maybe not been able to overcome them yet.
- Sometimes you are a little close-minded and you put stereotypes on other people. But when I sat down and listened to [community members'] stories, I put myself in their shoes and realized that living in the city is completely different from where I grew up. You try not to stereotype someone who is 16 and pregnant. You try not to judge at all and listen and try and learn from what their experience was.

Professional Skills. *Professional skills* refers to skills, behaviors, and dispositions that enhance efficacy in the workplace. Students described many activities related to their CBR experiences that they felt helped prepare them for professional careers. Skills probed include resolving conflicts, running meetings, delegating, listening to others, and working as part of a team. Comments pertaining to development of professional skills were pervasive across student interviews:

- You can't be shy. You have to be able to deal with people.

- To be on the spot and be able to think quickly and come up with ideas and have a conversation has been something that I am getting better at every time I do it.
- You learn very quickly to prioritize. Sometimes you have to push the community partners more than they are pushing you. Even though it is their project, you need to stay on them, especially when you have deadlines to meet.
- There is a huge difference when you are writing an email and you are trying to phrase it to make people like you. [But] you want them to do the work and actually tell them that they have an obligation to do it. So it is hard to find the middle ground.
- I learned that you can rely on other people to get things done.
- It makes you really focus on the fact that you have to work as a group to accomplish the goal. I would never have been able to come up with the survey the authors created without the help of all the group members.
- CBR is learning how to work with people more efficiently, communicate better, which is definitely an important life skill and makes me a good candidate in the work field.

“In class, the professor will hold your hand a little or you can Google something. But [CBR] cannot be found on the Internet or in any textbook. You have to pick up a phone or you have to drive to that organization, you have to keep pursuing it until something becomes of it, because if you don’t do it, no one will do it.”

Many students felt they had an edge in the job market because of their CBR experience. One student remarked:

- In class, the professor will hold your hand a little or you can Google something. But [CBR] cannot be found on the Internet or in any textbook. You have to pick up a phone or you have to drive to that organization, you

have to keep pursuing it until something becomes of it, because if you don't do it, no one will do it.

Personal Growth. *Personal growth* pertains to affective outcomes related to understanding oneself. Students spoke about significant internal transformations as a result of their CBR experiences.

- CBR shaped my thought from, “Let’s work in a lab and make lots of money” to “Money is not the most important thing, so maybe your career can be important in a different way.” Being involved in the community helped me realize that I want to do something that helps other people, something rewarding, not necessarily money-wise but morals-wise. [CBR] challenges you in a way that nothing else on campus can: not volunteering, not research papers. This forces you out of your comfort zone and seeing that you can live up to the challenges.
- I go to a great university where everyone is sheltered, but now seeing the community and the challenges and difficulties that they face means that I have to do something great with my life and give something back to the community.
- I grew up white, suburban, middle class. [Through my CBR project] I saw a different kind of life, people being exploited, people being oppressed, and it really changed my political outlook, my social outlook, what I fight for in my everyday life, and what I stand for.
- The CBR experience made me question a lot of the things that I had been going along with for a very long time.

Survey Pilot

The authors developed a pilot survey, which was deployed online during spring semester 2009, to students at institutions participating in a consortium dedicated to deepening and expanding the practice of CBR. The pilot version of the survey included 95 items and subitems in four sections and took approximately 15 minutes to complete. The first section identified the ways students experienced CBR (as part of a CBR course, in a non-CBR course

with a CBR project attached, in an independent study, etc.). This section of the survey also asked students to identify activities they undertook within their CBR projects, such as collecting data, analyzing data, reporting in class, or undertaking a reflection activity. Also included in this section was a series of nine items in which students rated their CBR experience as mostly positive, mostly negative, or mixed.

The second section contained 30 items reflecting the five dimensions of CBR noted above: academic skills, educational experience, civic engagement, professional skills, and personal growth. To help confirm the validity of the constructs, they were also assessed in a different way by nine items that followed within the same section.

The third section asked for students' demographic information, including institution, ethnicity, socioeconomic status, and history of volunteer and civic activities.

The last section included two open-ended items. One invited students to provide any other comments about their CBR experiences, and the other asked students to comment on their experience taking the survey. These open-ended items informed subsequent survey development.

The pilot version deliberately contained more items and types of questions than would be included in the final version. In some cases a given question was phrased in multiple ways, in order to determine which version yielded the most statistically reliable response. Some items tapped different dimensions of a construct in order to explore which dimensions, ultimately, would be most explanatory.

The survey was posted online from March 1 through June 6, 2009. A total of 192 respondents completed several items, and approximately 166 completed all or nearly all items of the entire survey.

Respondents were asked to identify their academic institution. Fifteen institutions were identified by a total of 170 respondents. Those institutions represented by more than two respondents included Bowdoin College, Cabrini College, Lafayette College, Macalester College, Princeton University, Rice University, Stetson University, University of Alaska–Anchorage, University of Notre Dame, Western Carolina University, and Whitman College. The authors believe this sample reflects a good range of academic institution types, based on Carnegie Foundation classifications (*see Carnegie Classification of Institutions of Higher Education, available at*

<http://www.carnegiefoundation.org/classifications>). Nevertheless, the sample is limited geographically (representing more institutions in the eastern United States), and is skewed toward institutions that have unusually strong CBR programs compared to academic institutions nationwide.

The majority of respondents (51.5%) were seniors, followed by sophomores (20.1%), juniors (19.5%), and freshmen (4.7%). Women made up 74.5% of the sample. Caucasians made up 76.8% of the sample, followed by Asians at 11%, African Americans at 6.1%, and Hispanics/Latinos at 5.5%, with less than 2% of respondents being Alaska Natives and American Indians. In addition, 6% of respondents identified themselves as "Other." (Respondents could self-identify as multiple races or ethnicities, so percentages total more than 100.) A proxy variable was created for socioeconomic status (see discussion in "Demographic Analyses," below). The variable describes a normal curve, ranging from a low of 8 to a high of 26 (mean=19), indicating that the sample population, like college students generally, is skewed toward middle- and upper-middle socioeconomic status.

In this sample, women and seniors are overrepresented, and Caucasians are slightly overrepresented. Broader sampling in the future might result in a different profile of outcomes. However, the authors believe that the distribution of responses on the pilot survey's demographic variables reflected sufficient representativeness and variability to conduct the item-level analyses that follow.

Results

In the first section of the survey, students reported the academic activities they undertook during CBR. Crosstab analyses showed that several categories could be collapsed, because over 70 percent of those who reported having experienced one type of CBR also experienced another. For example, 92% of those who reported that they had defined a problem/issue also reported researching a problem/issue. Given such overlap, the authors determined it was not necessary to subdivide these research activities (see Table 2).

Consistent with findings in prior research (Conway *et al.*, 2009; Eyster and Giles, 1999), students' responses in the focus group interviews highlighted the fact that integration of CBR activities into classes, including reflection activities, enhanced their experiences. Therefore, a survey item asked students to estimate the proportion of CBR courses that included some sort of reflection activity. This item correlated $r = .405$ ($p < .01$) with total CBR outcome score and

$r = .338$ ($p < .01$) with the combined (eight-item) CBR experience score, both of which are discussed below. These correlations suggest a moderate association between reflection activities and students' perceived quality of CBR experience.

Table 2. Frequency of CBR Activities Experienced by Respondents

CBR activity	% participating in this activity
Research problem/issue	76
Define a problem/issue	70
Collect data	70
Analyze data	62
Report results orally in class	58
Attend meetings with partners	42
Implement project with partners	21
Report to policy-makers	19
Present at a conference	16
Report to partners	5
Other	4

Assessing CBR Overall Experience

Predictably, students' experiences with CBR will vary. Making sense of CBR outcomes requires accounting for students' impressions of the overall quality of their CBR experiences. A series of five items probed various dimensions of students' CBR experiences, including the extent to which CBR was integrated into courses, supported by faculty, and appreciated by community partners; whether CBR activities were useful; and whether the student had voice in or control over the process. These items cover most of the best practices identified in the CBR literature (Puma et al., 2009; Stocking & Cutforth, 2006; Strand et al., 2003; Weinberg, 2003).

Response options to these items were "Mostly Yes" and "Mostly No."

"Making sense of CBR outcomes requires accounting for students' impressions of the overall quality of their CBR experiences."

The final item of this section, Overall CBR Experience, asked students whether their experience was positive overall, to which they could respond “Mostly Yes,” “Mostly No,” or “Mixed.” This single item was correlated with responses to the previous five items, which probed more specifically the quality of respondents’ CBR experiences. Table 3 shows inter-item correlations among CBR experience items as well as their correlation with the total learning outcome scores (see *Learning Outcome Scales*, below).

Scores on the five CBR experience items correlated with the overall CBR experience item at $r = .647$ ($p < .01$). This is a strong

Table 3. Correlations Between Overall CBR Experience Item, Combined CBR Experience Score, and Total Outcome Score

CBR experience items	Overall CBR experience item only	Total CBR experience score (all 6 items)	Total CBR outcome score (summed score of all five constructs)
CBR projects were integrated into course content.	.216**	.373**	.186*
Generally, I felt supported in my CBR experiences by college faculty/staff.	.360**	.581**	.373**
Interactions with community partners and community members were generally positive.	.448**	.731**	.455**
My CBR activities were useful to my community partner.	.431**	.704**	.489**
I have had some voice/control over CBR activities I've been involved in.	.394**	.642**	.482**
Overall, my CBR experiences have been positive.	1.0	.647**	.520**

*Correlation is significant at $p < .05$; **Correlation is significant at $p < .01$.

correlation, suggesting that the five composite items largely (but not entirely) explain the result on the overall CBR experience item. These five summed items correlated $r = .602$ ($p < .01$) with the total CBR learning outcome score—the summed total of all items constituting the five learning outcome constructs. This, too, is a strong correlation. The correlation of the single, overall CBR

experience item with the total CBR learning outcome scores was $r = .520$ ($p < .01$). This is a moderately strong correlation, but is nevertheless impressive, considering that the correlation coefficient is depressed because overall CBR experience is only a single item and had only three response options (i.e., “Mostly Yes,” “Mostly No,” and “Mixed”).

Learning Outcome Scales

The survey pilot included 30 learning outcome-related items, each of which was on a 4-point scale: 1 = not at all; 2 = minimally; 3 = moderately; 4 = extensively. Responses to these items were factor analyzed using principal components extraction with an Eigen value of 1 as the cutoff. This analysis was followed by a Varimax rotation. The principal components analysis revealed six factors that explained approximately 73% of response variance.

The first factor corresponded to the five items of the professional skills construct. This construct explained 58% of the overall variance, suggesting that this dimension of CBR is a critical benefit for many students. The second factor reflected four civic engagement items that explained 6.8% of response variance. Four items in the educational experience construct made up the third factor, which explained 6.5% of response variance. The fourth factor was academic skills. Three items loaded on this factor and explained 4.5% of response variance. (Four items on the revised survey constitute this scale; three items were used in the pilot and a fourth was added when the current version was deployed). Personal growth was the fifth factor and explained 3.6% of response variance. A sixth factor explained 3.4% of response variance and was made up of two items pertaining to public speaking skill and confidence. The authors determined that this factor contributed minimally to overall results, and therefore it was dropped from the revised version of the survey.

After removal of items that correlated very highly ($r = .80$ or higher) or that failed to have strong explanatory value (Eigen values less than 1.0), 19 items remained. Four experimental items were added in the current deployment. As a result of these analyses and revisions, estimated time to complete the survey dropped from 15 minutes to 10 minutes.

Scale Reliabilities

The 19 items making up five constructs were analyzed for internal consistency using Cronbach’s alpha. Reliability of each

of the five factors and a factor created from a combined total are shown in Table 4.

To summarize, 19 items can be summed to create a total CBR learning outcomes score that has extremely high reliability ($\alpha = 0.95$). The five factors that contribute to the overall CBR learning

Table 4. Cronbach's Alpha Reliabilities for Revised Factors

Scale	Number of items	Cronbach's alpha (α)
Overall CBR outcomes	19	$\alpha = 0.95$
Professional skills	5	$\alpha = 0.91$
Civic engagement	4	$\alpha = 0.86$
Educational experience	4	$\alpha = 0.87$
Academic skills	3	$\alpha = 0.80$
Personal growth	3	$\alpha = 0.94$

outcome variable have reliabilities ranging from $\alpha = 0.80$ to $\alpha = 0.94$.

The authors created unweighted, scaled scores for each of the five constructs listed above and for the scale as a whole. Most of the composite scores were inter-correlated moderately, which is desirable, since it suggests that each factor is assessing a different facet of an underlying phenomenon. As can be seen in Table 5, all scales correlate moderately or strongly with total CBR learning outcomes, indicating that each subscale captures an important aspect of students' overall perceptions regarding the benefits of taking classes that include CBR. Several moderate correlations indicate that each scale is measuring something similar about CBR outcomes, but also something unique. This, combined with the high coefficient alphas previously reported, suggests that each scale can be used to create scaled scores for each of the five constructs that comprise the survey.

Demographic Analyses

The authors analyzed construct data to see whether there were differences based on gender, race, or socioeconomic status (SES). Using analyses of variance calculations (ANOVA), the authors detected no significant differences among any groups on total CBR learning outcomes, nor for any of the five subscale scores. As a result, the authors concluded that the five scales and the combined

total CBR learning outcome scale reflect CBR outcomes that are not biased based on students' sex, race, or socioeconomic status.

In this survey, the authors used three items to determine SES (Donaldson, Lichtenstein, & Sheppard, 2008). Two items are mother's and father's highest level of education, because they are generally

Table 5. Scaled Scores, Factor Inter-Correlations (tailed)

		Academic skills	Civic engagement	Educational experience	Professional skills	Personal growth	Total CBR score
Academic skills	Pearson correlation	1	.528**	.584**	.466**	.589**	.714**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
Civic engagement	N	158	134	144	142	144	117
	Pearson correlation	.528**	1	.625**	.640**	.843**	.867**
Educational experience	Sig. (2-tailed)	.000		.000	.000	.000	.000
	N	134	144	138	132	137	117
Professional skills	Pearson correlation	.584**	.625**	1	.632**	.690**	.855**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
Personal growth	N	144	138	155	145	146	117
	Pearson correlation	.466**	.640**	.632**	1	.752**	.877**
Total CBR score	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
	N	142	132	145	152	145	117
Total CBR score	Pearson correlation	.589**	.843**	.690**	.752**	1	.911**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
Total CBR score	N	144	137	146	145	154	117
	Pearson correlation	.714**	.867**	.855**	.877**	.911**	1
Total CBR score	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
	N	117	117	117	117	117	117

** Correlation is significant at the 0.01 level (2-tailed).

known by students and they have a good track record in the research literature as correlating with income. The authors combined those responses with respondents' self-reported SES to come up with a single SES score. In combining the measures, they weighted mother's and father's education equally (if one was missing, they used the remaining score for both), combined them, and weighted the

result equally with self-reported SES. In this sample, the combined score of mother's and father's education correlated $r = .473$ ($p < .05$) with student self-reported SES, suggesting that different but related information is obtained using the two measures together, rather than one alone. The authors believe that this approach yields a more accurate SES proxy than traditional measures, militates against research bias, and validates respondents' perceptions of their own socioeconomic status.

Summary and Further Research

The goal of this research was to begin to codify student learning outcomes of CBR in order to assess best practices in CBR courses. To do this, the authors developed a survey instrument designed to validly and reliably assess student learning outcomes of CBR at the course, institutional, and national levels. The 19 items (plus four experimental items) that comprise the five CBR learning outcome constructs can be examined independently or summed into a combined scaled score. The constructs include academic skills, educational experience, civic engagement, professional skills, and personal growth.

It is worth highlighting that the professional skills factor explained 58% of the total response variance in our pilot survey. This prominence in the development of organization and leadership skills is congruent with the results of other studies of service-learning (see Eyles & Giles 1999; Moely, Furco, & Reed, 2008).

In addition to shortening and strengthening the CBR outcome scales, other revisions were made as a result of the pilot. The authors added three items to the CBR experience section based on student comments in the open-ended portion of the survey. The first item asks students to rate whether the term provided sufficient time to execute CBR projects. Respondent comments that prompted this addition include

- What detracted most from the CBR experience was the time limitations in dealing with a community partner over the course of only a single semester....
- After the semester ended, our project community partners were still interested in receiving feedback and help from us, but the authors had moved on to different courses....

A second item was added that asks respondents about the workload of CBR. This item was created based on comments such as the following:

- [The] major problem I had with this project was that half of the project was scheduled outside of class and I had to miss another class to do this project—the week before finals.

A third item was added asking students to rate whether their CBR projects, in general, were organized and expectations were clear. Several students offered qualitative comments in this regard, such as

- A little unorganized, directions weren't very clear.
- I like CBR; however, some students may need more guidelines or frequent check-in with their instructor.

Respondents of the pilot survey also commented that the instrument would be strengthened if students had the opportunity to explain the nature of their CBR projects. Because one objective of the survey was to identify a range of CBR practices nationwide, on the revised survey the authors added an open-ended item that allows respondents to briefly describe a CBR project.

The revised survey is currently being used in a national study of CBR outcomes, conducted by Princeton University. The survey can be accessed at https://princetonsurvey.qualtrics.com/SE?SID=SV_1YUKLLiSQIsxLQE (note underscore between “V” and “1”). Any student from any college or university who has experienced CBR is invited to participate. The authors ask that faculty make students aware of this link. The survey will be available through spring 2012 at the URL shown. Princeton will collect the data, perform the analyses, and report the results back to faculty members and institutions whose students participate.

Furthermore, the survey may be used by educators as long as no monetary gain is associated with its use. The web version assesses CBR student learning outcomes for cumulative CBR experiences. The authors have also created a version that can be used to assess outcomes related to an

“In addition, a revised version of this instrument could be used to study outcomes of CBR compared to traditional instruction or other pedagogies.”

individual course (see the Appendix). Interested parties may contact the authors regarding how to analyze the survey.

The national study alluded to above seeks to confirm psychometrics of the current survey and to begin to codify outcomes of CBR that might be related to delivery types and program features. Over time, local and national norms could be established that would allow analyses of CBR outcomes by institution type, region, delivery type, class standing, or other demographic variables. If scale reliabilities hold, the course-based version of the CBR Outcomes Survey could be used diagnostically. For example, if a CBR class had a t-score of 35 (one and a half standard deviations below the mean) for civic engagement, but scaled scores in the other areas above 50, this would suggest that more attention should be devoted to this aspect of the CBR experience the next time the class was offered. In addition, a revised version of this instrument could be used to study outcomes of CBR compared to traditional instruction or other pedagogies.

The authors believe that the instrument they described in this article can help quantify outcomes of CBR and hope that this instrument will help proponents of CBR assess their efforts, better understand this dynamic pedagogy, and assist them in making improvements, ultimately heightening students' learning experiences while conducting course-related research in authentic settings.

Acknowledgments

This article is based on work supported by the Corporation for National and Community Service under Learn and Serve America Grant No. 06LHHNJ001. Opinions or points of view expressed in this document are those of the authors and do not necessarily reflect the official position of the Corporation or the Learn and Serve America Program. The research was approved by Princeton University's Institutional Research Board for Human Subjects (Protocol 3708 for the focus groups and Protocol 4271 for the pilot survey). The ongoing survey has been IRB approved through Princeton University as Protocol 4687. The authors are grateful to Learn and Serve America, the institutions that hosted the focus groups and invited their students to take the pilot survey, and all of the students who answered our many questions. Cassie Gannett, doctoral student in the Morgridge College of Education at the University of Denver, transcribed the focus group interviews. Bobby Hackett, Denise Keller, and Peter H. Quimby provided valuable support and ideas to the research. Deanna Cooke provided helpful comments on a draft of this article.

References

- Billig, S., Root, S., & Jesse, D. (2005). *The impact of participation in service-learning on high school students' civic engagement* (CIRCLE Working Paper 33). [College Park]: Center for Information and Research on Civic Learning and Engagement (CIRCLE), University of Maryland.
- Boeije, H. R. (2002). A purposeful approach to the constant comparative method in the analysis of qualitative interviews. *Quality & Quantity*, 36, 391–409. Retrieved August 29, 2005, from <http://www.uu.nl/content/QQ.pdf>
- Coffey, H. (2010). “They Taught Me”: The benefits of early community-based field experiences in teacher education. *Teaching and Teacher Education: An International Journal of Research and Studies*, 26(2), 335–342.
- Conway, J., Amel, E., & Gerwein, D. (2009). Teaching and learning in the social context: A meta-analysis of service learning's effects on academic, personal, social, and citizenship outcomes. *Teaching of Psychology*, 36, 233–245.
- David, J. (2009). Service learning and civic participation. *Educational Leadership*, 66(8), 83–84.
- Deeley, S. (2010). Service-learning: Thinking outside the box. *Active Learning in Higher Education*, 11(1), 43–53.
- Donaldson, K., Lichtenstein, G., & Sheppard, S. (2008, June). *Socioeconomic status and the undergraduate engineering experience: Preliminary findings from four American universities* (AC2008-1010). Paper presented at the Annual Conference of the American Society of Engineering Education (ASEE), Pittsburgh, PA.
- Eyler, J. (2000). What do we most need to know about the impact of service-learning on student learning? *Michigan Journal of Community Service Learning*, 7, 11–17.
- Eyler, J., & Giles, D. (1999). *Where's the learning in service-learning?* San Francisco, CA: Jossey-Bass.
- Frumkin, P., Jastrzab, J., Vaaler, M., Greeney, A., Grimm, R. T., Cramer, K., & Dietz, N. (2009). *Inside national service: AmeriCorps' impact on participants*. *Journal of Policy Analysis and Management*, 28(3), 394–416.
- Gelmon, S., Holland, B., Driscoll, A., Spring, A., & Kerrigan, S. (2001). *Assessing service-learning and civic engagement: Principles and techniques*. Providence, RI: Campus Compact.
- Ghannam, M. T. (2007). Integration of teaching and research with community service for engineering programs. *European Journal of Engineering Education*, 32(2), 227–235.
- Hart, S. (2006). Breaking literacy boundaries through critical service-learning: Education for the silenced and marginalized. *Mentoring & Tutoring: Partnership in Learning*, 14(1), 17–32.
- Higher Education Research Institute. (2002). *Designing a student assessment study: The CIRP Surveys and the Input-Environment-Outcome Model: A technical report*. Los Angeles, CA: Higher Education Research Inst., Inc.
- Hunter, S., & Brisbin, R. (2000). The impact of service learning on democratic and civic values. *Political Science and Politics*, 33(3), 623–626.
- Keen, C. (2009). New efforts to assess civic outcomes. *New Scholars & Scholarship*, 10(7), 1–8.

- Lewis, T., & Niesenbaum, R. (2005). Extending the stay: Using community-based research and service learning to enhance short-term study abroad. *Journal of Studies in International Education*, 9(3), 251–264.
- Marullo, S., Cooke, D., Willis, J., Rollins, A., Burke, J., Bonilla, P., & Waldref, V. (2003). Community-based research assessments: Some principles and practices. *Michigan Journal of Community Service Learning*, 9(3), 57–68.
- Mehaffy, G. (2009, May). *Report on the Symposium on Assessing Students' Civic Outcomes*. Briefing paper presented at 2009 Symposium on Assessing Students' Civic Outcomes (AASCU), Indianapolis, IN.
- Moely, B., Furco, A., & Reed, J. (2008). The impact of individual preferences on service-learning outcomes. *Michigan Journal of Community Service Learning*, 15(1), 37–48.
- Phelps, A., & Dostilio, L. (2008). Student benefits of assigning a service-learning project compared to a traditional final project in a business statistics class. *Journal of Statistics Education*, 16(3). Retrieved from www.amstat.org/publications/jse/v16n3/phelps.html
- Pike, G. R. (2009). Assessment measures: Assessing program outcomes in the absence of random selection for participation. *Assessment Update*, 21(6), 11–13.
- Polanyi, M., & Cockburn, L. (2003). Opportunities and pitfalls of community-based research: A case study. *Michigan Journal of Community Service Learning*, 9(3), 16–25.
- Prentice, M., & Robinson, G. (2007). *Linking service learning and civic engagement in community college students* (Research Brief). Washington, DC: American Association of Community Colleges.
- Puma, J., Bennett, L., Cutforth, N., Tombari, C., & Stein, P. (2009). A case study of a community-based participatory evaluation research (CBPER) project: Reflections on promising practices and shortcomings. *Michigan Journal of Community Service Learning*, 15(2), 34–47.
- Sherman, A., & MacDonald, L. (2009). Service learning experiences in university science degree courses. *Innovative Higher Education*, 34(4), 235–244.
- Stocking, V. B., & Cutforth, N. (2006). A framework for assessing the challenges of teaching community-based research: Insights from two instructors. *Michigan Journal of Community Service Learning*, 13(1), 56–65.
- Strand, K., Marullo, S., Cutforth, N., Stoecker, R., & Donohue, P. (2003). *Community-based research and higher education: Principles and practices*. San Francisco, CA: Jossey-Bass.
- Vogelgesang, L., & Astin, A. (2000). Comparing the effects of community service and service-learning. *Michigan Journal of Community Service Learning*, 7, 25–34.
- Weinberg, A. (2003). Negotiating community-based research: A case study of the “Life’s Work” project. *Michigan Journal of Community Service Learning*, 9(3), 26–35.
- Westheimer, J., & Kahne, J. (2004). What kind of citizen? The politics of educating for democracy. *American Educational Research Journal*, 41(2), 237–269.
- Willis, J., Peresie, J., Waldref, V., & Stockman, D. (2003). The undergraduate perspective on community-based research. *Michigan Journal of Community Service Learning*, 9(3), 36–43.

About the Authors

Gary Lichtenstein is owner and principal of Quality Evaluation Designs (<http://www.QualityEvaluationDesigns.com>), a firm specializing in education research, evaluation, and policy. He also is consulting professor of research methods in the School of Engineering at Stanford University. His intellectual interests include mixed-methods research, community-based research, and engineering education.

Trisha Thorne is the assistant director of the Community-Based Learning Initiative at Princeton University. She is interested in how students, faculty members, and communities change as a result of community-based research.

Nick Cutforth is professor in the Research Methods and Statistics Program in the Morgridge College of Education at the University of Denver and adjunct professor in Community and Behavioral Health in the University of Colorado's School of Public Health. His research and teaching interests include community-based research and the improvement of physical activity and nutrition environments in K-12 schools.

Martin L. Tombari is senior research associate at Quality Evaluation Designs. He has been a professor of educational psychology, statistics, and research methods at the University of Texas and the University of Denver. He consults extensively with schools and mental health agencies in conducting program evaluation and research in such areas as peer victimization, truancy, and character education.

Appendix

**COMMUNITY-BASED RESEARCH
COURSE SURVEY**
June 2010

This survey is part of a national study on the outcomes of CBR. Your answers will be very important in helping colleges and universities design CBR programs. This survey will take less than 10 minutes to complete. We appreciate your honest responses to the questions below.

- For each of the following sections, please reflect on A SINGLE CBR COURSE that you have taken. A CBR course might not have had CBR in the title but might have involved collecting data and/or conducting research for a class or community-based organization.
- Research conducted in the community primarily for academic purposes DOES NOT COUNT. Research must have been in the service of a community partner.
- Your responses are anonymous.

I. About Your CBR Experiences

1a. Course Title: _____
Department: _____ Course Number: _____
Instructor(s): _____
Term: _____ Institution: _____

1b. Which description is most accurate for the above course? (Please check only one)

- CBR Course with project or internship
- CBR Theory Course, no project or internship
- Non-CBR course that included a project
- Independent CBR Project, Thesis, or Internship
- CBR Internship Only
- Other _____

2. Please check all of the activities you have experienced in CBR courses:

- Researched a problem/issue
- Attended meetings with community partners
- Interacted with community members and/or partners outside of meetings
- Participated in a community-based program/project
- Reported CBR findings in class (orally, in writing, or via technological media)
- Reported CBR findings to community partners (orally, in writing, or via technological media)
- Reported CBR findings to policy-makers (orally, in writing, or via technological media)
- Presented CBR findings at a conference
- Other: _____

3. Did the above course involve some sort of personal reflection activity (e.g., reflective paper, meeting with instructor, journal-keeping)? Yes _____ No _____

4. Please choose the answer that best fits your experience in this course. NA=Not Applicable.

- a. There was sufficient time in the term to execute my CBR project. Mostly yes Mostly no
- b. CBR project tasks and/or expectations were clear. Mostly yes Mostly no
- c. The amount of time taken for the course was realistic for the credits I earned. Mostly yes Mostly no NA
- d. The CBR project was integrated into course content. Mostly yes Mostly no NA
- e. Generally, I felt supported in my CBR experience by college faculty/staff. Mostly yes Mostly no NA
- f. Interactions with community partners and community members were generally positive. Mostly yes Mostly no NA
- g. My CBR activities were useful to my community partner. Mostly yes Don't Know Mostly no
- h. I had some voice/control over the CBR activities in which I was involved. Mostly yes Mostly No NA
- i. Overall, my CBR experience in this course was positive. Mostly yes Mixed Mostly no

5. In the space below, please briefly describe your CBR project.

II. CBR OUTCOMES

	My participation in this CBR experience:	Not at All	Minimally	Moderately	Extensively
a.	Strengthened my analytical skills				
b.	Improved my academic writing skills				
c.	Improved my research skills				
d.	Enhanced my understanding of academic content				
e.	Enhanced my understanding of local issues				
f.	Enhanced my understanding of social issues				
g.	Deepened my understanding of others who are not like me				
h.	Helped me empathize with those who have different racial or religious backgrounds than I.				
i.	Enhanced the likelihood that I will participate in civic activities.				
j.	Enhanced the likelihood that I will vote.				
k.	Helped clarify my values				
l.	Increased my interactions with faculty.				
m.	Increased my interest in my major.				
n.	Improved my interest in college.				
o.	Clarified my career path.				
p.	Improved my skills with conflict resolution.				
q.	Improved my ability to run meetings.				
r.	Improved my ability to delegate.				
s.	Improved my ability to listen to others.				
t.	Improved my ability to work as part of a team.				
u.	Helped improve my personal qualities.				
v.	Improved my ability to consider others' perspectives.				
w.	Deepened my understanding of myself.				

Please share any other thoughts about your CBR experience and how it has impacted you.

III. About You

This information is most important for helping us understand your responses.
We greatly appreciate your responses to the following questions.

WHAT'S YOUR ACADEMIC INSTITUTION? _____

YOUR CLASS STANDING IS: Freshman Sophomore Junior Senior Master's/Doctoral

YOUR SEX: Female Male

RACE/ETHNICITY (Check all that apply):

- African American Caucasian Other
 American Indian or Alaskan Native Hispanic or Latino/a
Islander Native Hawaiian or Pacific Islander
 Asian American

MOTHER'S HIGHEST LEVEL OF EDUCATION:

- N/A or Don't Know
 Less than High School
 Completed High School or GED
 Some college, but no degree
 2-Year/Technical/Vocational Degree
 4-year/Bachelor's Degree (B.A./B.S., etc.)
 Master's Degree (M.A., M.S., etc.)
 Professional Degree (Ph.D., M.D., J.D.)

FATHER'S HIGHEST LEVEL OF EDUCATION:

- N/A or Don't Know
 Less than High School
 Completed High School or GED
 Some college, but no degree
 2-Year/Technical/Vocational Degree
 4-year/Bachelor's Degree (B.A./B.S., etc.)
 Master's Degree (M.A., M.S., etc.)
 Professional Degree (Ph.D., M.D., J.D.)

THINKING BACK ON WHEN YOU WERE GROWING UP, WOULD YOU DESCRIBE YOUR FAMILY'S INCOME AS...?

- Low Lower-Middle Middle Upper-Middle High

😊 THANKS FOR YOUR COOPERATION! 😊

