Proto-STARS Pilot: A Nine Campus Collaboration to Adapt the STARS Sustainability Assessment to Northeast Boarding Schools

A thesis

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Abstract

This study evaluates the early implementation of a pilot program of the Sustainability Tracking Assessment and Rating System (STARS), referred to as proto-STARS, which occurred between spring 2010 and spring 2011 at nine northeast boarding schools. The schools comprise the total sample size for the pilot program, and the research focused on an internal comparison.

The evaluation centered on clarification of program implementation in three areas: program use, implementation variation and lessons learned. Early implementation was assessed in a qualitative study based on assessment data and interviewee responses. Fewer than half of the schools completed the assessment tool within the projected timeline. Of the schools that reported a sustainability rating, two were Bronze level and two were Silver level. A cross group comparison between the assessment completers and non-completers suggests that few distinguishing factors exist between the two groups. Individual campus circumstances and difficulty collecting necessary data within the pilot program's timeframe might help explain the limited completion rate.

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Chapter 1: Introduction

In 2011, sustainability programs are increasingly common on college and university campuses in the United States. The development of the campus sustainability field largely parallels the growth of sustainable development as laid out in the 1987 United Nations World Commission on Environment and Development (commonly referred to as the Brundtland Report). The Brundtland Report, as synthesized in Bardaglio and Putnam (2009), is regarded as forming a common definition of sustainability to mean "meeting the vital needs of the present generation without undercutting future generations' ability to meet their own needs" (p. 2). As concerns surrounding natural resource use policy and planning and human equity gained momentum in the international dialogue, colleges and universities soon considered their responsibility around education and operation for sustainability.

In response to the growing emphasis on sustainability within institutional priorities in higher education, several professional associations formed to serve as organizational arms within the field. The area of appropriate assessment is of particular interest to many. In short, schools began to raise practical questions such as 'what is a sustainable campus?' And, as the Higher Education Associations Sustainability Consortium (HEASC) asked in 2006, "how do we know which campuses are leading in sustainability?" The previous question was the impetus for HEASC to call for an assessment and rating system that would function as a common metric for campuses (AASHE, 2009).

In 2009, after three years of research and development, the Association for the Advancement of Sustainability in Higher Education (AASHE) launched its response to HEASC's call to action. The Sustainability Tracking Assessment and Rating System (STARS) program was designed to provide colleges and universities a tool to evaluate campus sustainability efforts and encourage continued progress in the field. To date, 250 institutions have joined the STARS program as a way to assess their campuses' current sustainability programs (AASHE, 2011). Moreover, STARS encourages transparency regarding a school's policies and practices as all submissions are posted on STARS public website.[1]

Significantly, similar to colleges and universities, secondary schools moved to adopt sustainability programming. In the northeast, a group of nine residential boarding schools were particularly intrigued by the STARS program model since their institutions resemble the infrastructure and operations of those in higher education. That is, with the exception of the age of the students, physical plants and financial operations the schools share many of the same characteristics. In the spring of 2010, the group received permission to use the STARS assessment template in an informal pilot program, referred to henceforth as proto-STARS. Sustainability coordinators from each of the schools committed to completing the assessment report and sharing results within the group.

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[1] See < https://stars.aashe.org/>.

This thesis critically evaluates the early use and implementation of proto-STARS as it occurred in the aforementioned nine boarding schools. The primary purpose of the study is to chronicle how and to what extend the schools implemented the pilot program. Specifically, the research includes an examination of program implementation in three areas: program use in general, variation in implementation patterns and lessons learned from program implementation. To a lesser extent, the study also considers what the program participants expected to achieve, in the way of preliminary effects, by taking part in the assessment program.

The introductory chapter seeks to place the STARS and proto-STARS programs within the emerging framework of campus sustainability and describes the overall goals of this evaluation and research approach. Chapter Two, the literature review, explores the development of campus sustainability programming and the role of assessment and metrics within the field. Moreover, the literature review examines disclosure theory and addresses research that both challenges the notion that greater transparency leads to enhanced sustainability performance and the existing counter arguments. A brief discussion of preliminary research in the area of sustainability assessment at the secondary level is also offered. The literature review concludes by making note of the limited research on STARS (most likely due to its newness) and explains the need for future research on the implications of assessment on campus sustainability initiatives.

Chapter Three situates the development of proto-STARS within the context of the nine schools' Sustainability Group. The group has been meeting semi-annually and for nearly three years to share information and best practices related to campus sustainability. The chapter continues with a detailed description of the pilot program. The program components discussed include: target population, program description, mission, goals, objectives, theory of change, service components and context. The aforementioned topics address various aspects of the proto-STARS program as it was designed for the nine schools' use. In the end, it is most important to note the collaborative process with which the pilot was designed and implemented as well as to understand how these schools adapted the STARS assessment tool to work at the secondary level.

Chapter Four addresses the methodology used to evaluate the proto-STARS pilot program. In particular, the chapter explains the evaluation design within the framework of Jacobs and Kapuscik's (2000) Five-Tiered Approach. The research included in this study was designed to address three areas of program implementation among the nine schools:[2]

- Program Use
- Implementation Variation
- Barriers and Facilitators to Implementation

These research topics were examined using semi-structured interviews with the proto-STARS coordinator on each campus.

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[2] Jacobs and Kapuscik (2000) define program clarification evaluations as serving a variety of purposes, including, as is relevant to this study, considering whether the program is "being implemented as planned" (p.198).

Chapters Five and Six address research findings and offer some concluding thoughts on the evaluation project. Chapter Five presents the study's findings on the early implementation of the program. The findings section also includes brief discussion of the participants' reflections on their goals for participating in the pilot program.

Chapter Six discusses the future of proto-STARS, highlighting limitations of this research and offering final thoughts. In the end, the analysis stresses the preliminary nature of this research and posits that future evaluation of both proto-STARS and STARS is essential to understanding the implications of this tool.

Chapter 2: Literature Review

This literature review surveys scholarship in the areas of campus sustainability, the theory of voluntary disclosure and the future of STARS at the secondary level. While specific academic research on STARS does not yet exist, there is a small body of scholarly work that lays the foundation for how it contributes to metrics within the field of campus sustainability.

Campus Sustainability: A Brief History

As mentioned in Chapter One, the development of campus sustainability programming took hold around the time of the 1987 Brundtland Report's call for sustainable development. As the notion of sustainable development gained momentum, campuses began to engage more intentionally in the conversation about the responsibility of institutions to operate and educate according to the principles of sustainability. Over the past few decades, campus sustainability programming has grown from a handful of flagship programs to an emerging component of institutional priorities.

Merkel and Litten (2007) provide a useful history of sustainability initiatives at the college and university level with a specific regard to the role of higher education and sustainability programming. In particular, the authors draw close attention to the Talloires Declaration as one of the first institutional articulations of a goal in terms of sustainability. Among the ten goals listed in the Declaration were commitments that would promote environmental literacy on campus, foster a community culture that accounts for sustainability practices and

commit to practicing "institutional ecology" (Merkel and Litten, 2007). In the two decades since the founding of the Talloires Declaration, several hundred campuses across North America and internationally have made commitments to sustainability initiatives centered on the ideals laid out in the declaration (ULSF, 2010).

The number of support programs for sustainability initiatives has also increased significantly since the late 1980s. To date, 677 schools have signed the American College and University Presidents' Climate Change Commitment (ACUPCC) (ACUPCC, 2010). Merkel and Litten (2007) also focus on the development of professional associations (e.g. AASHE), the existence of annual conferences focused on "greening the campus" and the dedication of journal editions exploring campus sustainability.[3] Moreover, in a 2010 presentation, AASHE's Executive Director, Paul Rowland, noted that there are over 100 academic degree programs with a sustainability focus and 905 campus buildings that have been LEED certified for green building practices (Klein, 2011).

While Merkel and Litten (2007) applaud the growing recognition within the higher education field that it must take action to promote environmental and social stewardship, they point to the United Kingdom as an example of a national system that connects educational institutions with measurement standards similar to those in the corporate sector. The authors conclude that campuses and corporations both play an important role in addressing challenges associated with goals for sustainable development.

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[3] For example, in 2003 the Society for College and University Planning created a special issue focused on campus sustainability.

Bardaglio and Putman (2009) broaden the discussion to a framework that includes consideration of the values associated with campus sustainability. These scholars begin their book by claiming that the institutionalization of a sustainability agenda is pertinent to schools, "[g]iven threats such as the growing disruption of the climate, staggering levels of poverty in the developing world, and the looming peak oil crisis..." (p. 4). To provide context for their goals of sustainability in education, they call attention to several schools that have demonstrated particular leadership in the area of institutionalizing sustainability goals. While the book includes many examples of institutional commitments to environmental stewardship, Maine's College of the Atlantic stands out because of the role that college president, David Hales, played in directing the college's goal to become carbon neutral. In addition to providing a snapshot of several leaders in the field of sustainability, the authors suggest that AASHE's STARS tool might be way for schools just starting to consider policies and practices around sustainability to develop long-term strategies for incorporating sustainable practices (Bardaglio and Putman, 2009).

As noted in Bardaglio and Putman's (2009) work, the emergence of the climate change dialogue created a specific framing of the issue of campus sustainability. And, significantly, it is one that the STARS tool certainly identifies. While published before the development of STARS, Rappaport and Creighton (2007) pay particular attention to the role of campus planning (both climate and master) and goal setting around emissions reductions. Rappaport and Creighton (2007) concur with the notion that colleges and universities have a

distinct role in setting the sustainability agenda. They point to the growing international concern over threats related to climate change and argue that schools are uniquely positioned to "reduce their emissions of heat-trapping gas at the same time they educate and inspire members of their communities, develop new technologies and, in many cases, reduce long-term energy costs" (p. 12).

Merkel and Litten (2007), Bardaglio and Putman (2009), and Rappaport and Creighton (2007) combined provide a fairly comprehensive review of the origins of campus sustainability and its evolving role within the campus community. To date, the literature that provides an overview of campus sustainability programming tends to focus on higher education and not secondary campuses. That said, those involved in the proto-STARS program are very familiar with the trends of higher education and tend to align themselves with that sector, as opposed to public or non-residential schools.

The Role of Voluntary Disclosure

The core of the STARS tool rests upon a "voluntary, self-reporting framework" (AASHE, 2009). While the program is too new to be studied for the implications of a voluntary and transparent assessment system within higher education, there has been academic research (primarily in the for-profit sector) on the role of voluntary disclosure in environmental performance. Significant literature exists around the theory of voluntary disclosure from an economic standpoint, arguing that a firm's decision to disclose information (positive or negative) is perceived as more beneficial than the skepticism that might exist from stakeholders if information is withheld (Clarkson, Yue, Richardson, and Vasvari,

2008; Herschovis, Herremans and Warsame, 2009). At the time of writing, there is no indication in the literature that campus sustainability performance will be tracked in a non-voluntary manner. Therefore, it is useful to consider academia's conclusions about the implications of voluntary reporting on organizational performance.

As a generalization, there is a lack of consensus on the value of voluntary reporting systems in the improvement of an organization's environmental performance (Herschovis et al., 2009).[4] Appropriate to the context of STARS, several recent publications based their research on the sustainability guidelines as defined by the Global Reporting Initiative (GRI).[5] The GRI was founded in 2002, out of an initiative from the non-profit CERES, to provide a framework for organizations to report on non-financial information regarding performance (GRI, nd). According to Dingwerth and Eichinger (2010), the GRI is "regarded as the world's leading voluntary scheme for corporate non-financial reporting" (p. 76). Clarkson et al. (2008) conclude that there is a positive relationship between "environmental performance and the level of discretionary disclosures in environmental and social reports..." (p. 325). In other words, the researchers found that those with high levels of environmental performance were more likely to voluntarily provide information on their practices.

Dingwerth and Eichinger (2010) offer a challenge to the notion that increased disclosure necessarily leads to a more sustainable organization.

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[4] It is becoming more common that assessment tools and evaluations consider a broader range of sustainability indicators rather than solely environmental.

[5] The structure of STARS's assessment system was largely based on two pre-existing tools: the Global Reporting Initiative (GRI) and the Leadership in Energy and Environmental Design (LEED) rating system (J. Dautremont-Smith, personal communication, November 2010).

Specifically, the authors examine the relationship between transparency and empowerment by stakeholders within or connected to an organization (Dingwerth and Eichinger, 2010). The notion of empowerment from disclosure is particularly relevant in the context of STARS as the program lists, among several other goals, building "a stronger...sustainability community" and providing a "guide for advancing sustainability in all sectors of higher education" (AASHE, 2011). Dingwerth and Eichinger's (2010) analysis raises a skeptical eye toward the idea that voluntary levels of transparency lead to higher levels of engagement or demands for improved performance of firms. Most notably, the authors point to GRI's claim that transparency can be an effective strategy for organizational change if it is guided by the "criteria of value, accessibility, comprehensibility, and comparability" yet there is not a system in place to closely monitor or, perhaps more importantly, enforce the aforementioned criteria (p. 91). Similar to the GRI, STARS is as a self-reporting system and does not have an enforcement system with which to ensure that institutions report honestly.

Specifically regarding comparability, as this is one of STARS' goals, Dingwerth and Eichinger (2010) suggests that the GRI has made efforts to ensure reliable comparison, but not without some challenges. The authors point to a specific example of comparing greenhouse gas emissions within the automobile industry. Their findings suggest that while reporting companies included what seemed to be complete information closer examination suggested difficulty in comparability (Dingwerth and Eichinger, 2010). It was the case with the automobile industry that companies varied in how they reported direct versus

indirect emissions and well as which year they used for the reporting (Dingwerth and Eichinger, 2010). Such differences make it difficult for a GRI user to have a true sense of which company is performing better or worse than others. In the area of greenhouse gas emissions, STARS attempts to promote valid comparison across institutions by requiring that all schools use the same baseline, 2005, and include scope one and scope two emissions, as defined by the Greenhouse Gas Protocol's Corporate Accounting and Reporting Standards (AASHE, 2011).

Given the recent release of Dingwerth and Eichinger's (2010) study, it will be important to assess future literature on the topic of transparency and empowerment for better performance. Most interestingly, of course, could be an examination of the STARS program specifically. It is important to remember that the majority of disclosure theory literature refers to the for-profit sector whose motivations and reactions, it seems safe to assume, may depart from the goals of education and other non-profit organizations.

Campus Rating Tools

Since the first installment of STARS v. 1.0 ratings are not due to be published until later in 2011, the literature has not assessed its effectiveness or impact on campuses. There is, however, limited research and evaluative literature that explores the use and effectiveness of campus rating tools.

Perhaps most notable is Shriberg's (2002) article that considers a variety of tools and points to the importance of "cross institutional assessment tools" or systems that compare one campus' sustainability ranking to others (p. 254). The article bears particular consequence to this program evaluation in that STARS

works across the boundaries to help schools reach specific goals such as the Talloires Declaration or zero greenhouse gas emissions. What is most interesting about Shriberg's (2002) analysis is not that one tool was found to be particularly more useful than others, but, rather, that despite significant differences in assessment theories, cross institutional assessment was simply a useful strategy for institutionalizing sustainability efforts. Shriberg (2002) justifies his support of such metric systems because they offer a means of "operationalizing" cross-institutional policies, such as the Tallories Declaration or the more recent American College and University Presidents' Climate Change Commitment (p. 255). By operationalizing policies, Shriberg (2002) means that assessment tools, unlike more abstract statements of commitment, help facilitate actual changes in practices and policies and allow for progress to be tracked over time, and, as is the case with STARS, across institutions, because they call for measureable changes in campus activities.

At least some practitioners in the field of campus sustainability agree with Shriberg's claim about the benefits of using assessment tools to achieve sustainability goals. Thompson and Creighton (2007) underscore the importance of monitoring sustainability efforts concluding that, "[c]onsistent reporting on the basic indicators of environmental impact offers several benefits: supporting the mission of the institution, complementing academic programs...and raising awareness of critical sustainability issues" (p. 42). That said, Thompson and Creighton (2007) caution practitioners that meaningful comparison and rating tools are not simple to design**.**

Fonseca, Macdonald, Dandy and Valenti (2011) concur with the cautious tone of Thompson and Creighton (2007). In a study of campus assessment reports published by Canadian universities (using reports released prior to the 2009 release of STARS), the authors conclude that the reports "generally had limited scopes emphasizing eco-efficiency" (Fonseca et al., 2011, p. 22). Fonseca et al. (2011) point to several key factors limiting the state of sustainability reporting at Canadian universities. First, many campuses did not participate in sustainability tracking at all. Of the reports that have been published, Fonseca et al. (2011) note that they tend derive from the work of student research and/or a small group of faculty or staff which limits the ability to gauge whether or not the administration at large is involved or aware of practices and policies around issues of sustainability. Also, as noted earlier, the authors highlight that the reports were heavily focus on "eco-efficiency" and did not include social and economic considerations that are emphasized in assessment systems such as the GRI (p. 35).

While STARS is too new to be a centerpiece in the discussion and academic research around sustainability assessment tools and cross-institutional comparison, it is important to assess whether or not the tool seems to address concerns raised over past assessment efforts. First, it is important to consider the issue of cross-institutional comparison. Shriberg (2002, 2004) calls for assessment systems that allow campus staff track their operations over time and across institutions. What the author is less convinced on is whether or not there is a need for a "universal tool" (Shriberg, 2002, p. 268). Shriberg (2002) suggests that the time and effort needed to construct a meaningful universal tool might not

be a worthwhile investment given that campuses are unique in operations in culture. It is not clear whether Shriberg still agrees with his 2002 statement, but it does appear that many in the field, perhaps as a response to the increasing number of outside assessment systems,[6] feel that a common metric has the potential to be a useful instrument.

As will be discussed in later chapters, one of the benefits of the STARS comparison tool is that there many ways for a school to receive, for example, a Silver rating. This is true because STARS includes economic, environmental and social components of sustainability so schools are assessed from a combined perspective rather than simply, as has been the focus of many programs, eco-efficiency. Moreover, since the STARS assessment is published on a public website, an interested person looking to compare a specific credit would know whether or not the institutions of interest claimed points in that area.

In addition to comparability, many critics of assessment metrics wonder about the prevalence of rankings. Fonseca et al. (2011) comment that outside ranking systems "are in a sense "pressuring" sustainability accountability, rather than "presenting" it (p. 25). That said, it is not clear from the authors whether such pressure is a negative or positive reality of rankings. While the campus sustainability literature does not discuss this point in great detail, it seems possible that some would argue that it is the movement taken toward becoming a more

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[6] In recent years several organizations, such as AASHE and the Sustainable Endowments Institute, have developed frameworks to assess and measure campus sustainability efforts. These outside systems vary from internal assessments in that internal assessments are developed for a single institution by that institution.

sustainable campus that is most important, not necessarily the motivation behind such action.

Writing before the development of STARS, Shriberg (2002) suggests "scholars and practitioners need to either help shape a sustainability ranking system or provide a clear rationale for why ranking is not appropriate" (p. 268). STARS seems to have been developed with cautions about ranking in mind, since the program makes a clear distinction between ranking and rating. As will be discussed in Chapter Three, the design of STARS is such that schools receive a rating, ranging from Bronze to Platinum. Simply put, in the ideal world of STARS, all campuses would be Platinum rated institutions rather than having one institution that is most (i.e. ranked number one) sustainable. Moreover, given that the STARS tool was created by a campus sustainability organization with immense input from its members, many of whom are practitioners on campuses, it seems that there is at least some agreement in the field that a system for clarifying and measuring what it means to be a "sustainable campus" is a point of interest. As is the case for STARS, once the proto-STARS research is made available, it will be critical to continue the conversation about the values and challenges of sustainability assessment and rating instruments.

STARS at the Secondary Level

STARS co-founder and current Steering Committee Chair, Julian Dautremont-Smith, has begun the process of considering rating systems in the secondary school sector. While the research is still in its preliminary phase, Dautremont-Smith is examining over thirty sustainability related assessment tools

geared toward secondary schools. The programs are evaluated under a variety of criteria, including: level of transparency, reporting strategy, scope, achievement level and development process (Dautremont-Smith and Barros, 2010).

Dautremont-Smith's initial findings point to several limitations with the current offering of rating/tracking options for secondary schools and argue that a STARS-like program might be an appropriate option for some. Noted challenges with current tools include: lack of common definition of sustainability terms, duplication among tools, lack of consistency with standards (leading to difficulty in cross-institution comparison) and limited public recognition (Dautremont-Smith and Barros, 2010). Again, the full findings of Dautremont-Smith's research have yet to be released, but preliminary reporting suggests that STARS was an appropriate tool for the nine schools' desire for cross institutional comparison.

Summary

Much of the literature around campus sustainability is focused on anecdotal evidence of best practices. Despite a limited amount of comprehensive research on this topic, a review of the literature surrounding campus rating systems suggests that scholars and practitioners alike see value in utilizing indicators to track changes in sustainability practices. Less clear is which rating format is most effective or efficient. More importantly, it remains uncertain whether measuring campus performance over time leads to more sustainable institutions. The STARS system seems to have the support of many in the field; however, it is still too early to say what the assessment will be once the first round

of ratings is published. Moreover, given the emphasis on transparency and the lack of academic consensus on disclosure practices in the for-profit sector, the time for a rigorous examination may be imminent. Given the growing interest in metrics as a tool to improve campus sustainability, it is likely that scholars will begin to assess the effectiveness of STARS in the near future.

Chapter 3: Campus Profiles and the Proto-STARS Program

This chapter begins with profiles of the nine schools in the pilot program, and then proceeds with a detailed description of the proto-STARS program, highlighting several key characteristics critical to the analyses that follow.

Campus Profiles

Nine northeast residential independent boarding schools represent the implementation group for the proto-STARS pilot program.[7] There are several commonalities across the nine schools. First, they are all located in the northeast, representing the states of Connecticut, Massachusetts, New Hampshire and New Jersey. The proximity of the schools explains why they have a history of collaborating on initiatives. The similar location is also particularly important when considering cross-institutional comparison as weather is an important factor in determining energy use. Additionally, the schools are designated as independent and are not-for-profit institutions. Other commonalities include the fact that they all have a boarding student population, provide housing for some portion of the teaching faculty, operate a power plant and have an endowment.[8] These similarities mean that the schools fit the template of the STARS assessment

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[7] The identity of the schools will be kept anonymous for the purpose of this study.

[8] It is important to point out that the endowments of the nine schools (along with approximately 4,000 institutions of higher education in the US) are particularly relevant because they represent the high level of spending power and consumption (e.g. energy, building space, etc.) power available to such institutions (Hignite, 2006). Moreover, Rappaport and Hammond's (2007) research suggests a relationship between institution wealth (a large portion of which is represented by endowment value) per student and emissions per student (i.e. the wealthier the institution the greater its emissions). The nine schools included in this study have a combined endowment value of approximately three billion dollars (see Table 3-1).

which considers sustainability practices from multiple perspectives, including physical plant operations and financial management policies. Moreover, the schools' sustainability coordinators had a history of collaborating prior to the decision to participate in proto-STARS. This previous relationship suggests that the group was well positioned to incorporate an initiative such as proto-STARS into its structure. The group has been communicating and meeting on a semi-annual basis since 2008. The decision to participate in the proto-STARS program came out of a series of meetings where the schools' sustainability representatives focused on information sharing. Not only do the schools' sustainability coordinators have a history of collaborating, but eight of the nine schools collaborate on a variety of campus related issues, from athletics to academic departments to senior administrators.

Table 3-1 provides a snapshot of contexts into which the proto-STARS program has been introduced. The student population ranges from just under 400 to just over 1,000 students. Similarly, there are differences in number of buildings, building square footage and endowment value. While it is not the purpose of this study to examine the details of the schools' proto-STARS results, such differences would be especially important to note if future studies attempt to do so.

Table 3-1: Proto-STARS Participant Profile

	Student Pop.	Bldg. Sq. Ft. (million)	Sq. Ft. Added Since 2005	# Bldgs.	# Acres	Endow. Value (million)
A	1,111	1.8	19,140	155	550	$695 (as of 6/10)
B	394	.5	73,088	40	~400	$85 (as of 3/11)
C	831	1.2	64,567	121	458	$240 (as of 6/10)
D	620	1	--	90	280	$314 (as of 6/10)
E	1,000	1.5	21,250	130	670	$860 (as of 8/10)
F	597	1.1	90,000	81	827	$360 (as of 1/11)
G	800	1	40,000	119	750	$360 (as of 3/11)
H	650	--	--	35	1,780	$112 (as of 9/10)
I	535	1.2	24,457	112	~1,800	$381 (as of 6/10)

Profile data collected from proto-STARS data, personal communication and schools' websites.

Proto-STARS Program

The campus sustainability coordinators were given permission to implement proto-STARS by the STARS staff with the condition that the tool be used by the nine schools that already operated as a collaborative group. As of this writing, the pilot program is not being utilized by any other non-college or university campuses. The basis of participation of the nine schools stems from the fact that boarding schools share many operational and infrastructure features with colleges and universities. Moreover, a representative from AASHE is considering the development of a sustainability assessment tool for independent secondary schools. The proto-STARS program will help in assessing the applicability for other secondary institutions.

Target Population and Program Description

Proto-STARS is a pilot program whose design closely mirrors the college and university STARS assessment tool. STARS was developed between 2006 and 2009 with several pilot versions prior to the version 1.0 launch in January 2010 (AASHE, 2010). Just after the version 1.0 launch of STARS, the nine schools received permission to use the tool and test the applicability of the rating system on their campuses. The agreement to formally pilot the program on the nine campuses was made in May 2010. Throughout the process, the schools have communicated their progress and shared initial results among the group. The results of the proto-STARS pilot program will be introduced to the schools' heads in spring 2011.

The STARS program can be most easily understood as a rating system based on a substantial list of possible credits. Similar to the widely recognized LEED system for building design, the ratings are based on a bronze, silver, gold or platinum level. In order to receive a rating, a school must complete the sustainability assessment report. The assessment is separated into three main categories: 1) Education and Research, 2) Operations, 3) Planning, Administration and Engagement. Each category is made up of a series of credits. Primary credits, referred to as Tier One, are worth anywhere from one to fourteen points and some include partial credit based on proportions of quantitative measurements. The categories also have a small number of Tier Two credits, worth .25 point each. A school's rating is based on the average of the three categories. If an institution earns 30 percent of points in Education and Research, 50 percent of points in Operations and 40 percent of points in Planning, Administration and Engagement, the STARS score will be 40. Institutions also have the opportunity to submit up to four innovation credits, defined as projects/programs that are not otherwise covered in the credit list (see Table 3-2).

Table 3-2: Proto-STARS Rating Overview

Proto-STARS Assessment		
Education	Operations	Planning, Administration & Engagement
Co-Curricular Curriculum	Buildings Climate Dining Services Energy Grounds Purchasing Transportation Waste Water	Coordination & Planning Diversity & Affordability Human Resources Investment Public Engagement
proto-STARS Points: __/55.00	proto-STARS Points: __/99.75	proto-STARS Points: __/88.75

Rating = average of % points claimed in each category + 0-4 innovation points

Rating Level	Minimum Score Required
Bronze	25
Silver	45
Gold	65
Platinum	85

Proto-STARS was modified from the STARS program in several key areas (see Table 3-3). First, registration for STARS requires a fee and a formal commitment from an institution's president. Proto-STARS, a pilot program, does not involve a fee and was completed by the nine schools' sustainability staff in order to test the tool and decide whether or not to recommend a formal commitment from their head of school. Second, STARS submission requires that the assessment report be uploaded to the AASHE's STARS website for public viewing of both the total points claimed and a description of why a school

believes it deserves the points claimed. Proto-STARS does not have a public viewing platform; however, the schools' coordinators have worked on a voluntary basis to share their current rating and report details about the source for points claimed on individual campuses and within the group of nine schools. In short, proto-STARS data are stored with the individual institution while STARS participants report in a public online format. Third, the STARS credit checklist was edited by members of the nine school group to remove credits that did not seem relevant for secondary school campuses. In the education category, for example, credits related to research were removed as the criteria were not appropriate for high schools. Editing the credit list changed the total number of points possible in the proto-STARS assessment. In STARS, each of the three categories has a total of 100 points possible. Given that, proto-STARS has a different number of points possible in each category (see Appendix A for a list of proto-STARS credits and total points per category). However, since ratings are based on percentage of total points possible, the overall scoring system is the same in both versions of the program.

Table 3-3: Key Differences Between STARS and Proto-STARS

STARS	Proto-STARS
• Registration Fee, letter of acknowledgement from President	• No Registration Fee, no formal approval required from administration[9]
• Public Reporting	• No Public Reporting
• Original Credit List	• Modified Credit List

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[9] The preliminary nature of this pilot project allowed for this omission, however, each of the schools' head was made aware of the initiative and the heads plan to discuss the project during an April 2011 meeting.

Mission, Goals and Objectives

Jacobs and Kapuscik (2000) underscore the importance of defining a program's mission, goals and objectives early in the evaluation process. Doing so allows program coordinators and researchers alike the ability to clearly consider the intentions of a program compared to what actually occurs.[10] In the case of the proto-STARS pilot program, the articulation of mission, goals and objectives helps to clarify whether the participant's perception of the program's effects and the implementation process align with the program design. The mission, goals and objectives defined below relate specifically to the proto-STARS program as informed by its slight modification of STARS.

Jacobs and Kapuscik (2000) define these terms as follows:

- A program's *mission* articulates the "dream" or "ideal." In other words, how the world might change or be improved if this program reached its pinnacle;

- Program *goals* describe the intended impact of a program on participants or recipients and are more "reachable" than a program's mission;

- *Objectives* are unique in that they represent short-term and measurable steps taken by a program in order to move toward stated goals (p. 68).

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[10] Distinguishing between a program's goals and objectives and how participants utilize it is important because the goals and objectives provide a framework for users to choose implementation strategies to best accomplish the stated goals and objectives. A researcher can then assess implementation by considering whether specific activities align with the stated goals and objectives (Francine Jacobs, personal communication, April 2011).

Proto-STARS Mission. Schools that operate and educate with minimum negative impact on the natural environment and maximum attention to social well-being are an important component of a sustainable and just future. [11]

Proto-STARS Goals and Objectives. A comprehensive sustainability assessment and rating tool allows for meaningful benchmarking both within an institution over time and in comparison to other institutions, ultimately leading to a *more sustainable institution*. To measure whether or not schools are reaching the goal of the program, the assessment includes measureable benchmarks in each of the three categories [(1) Education and Research, (2) Operations and (3) Planning, Administration and Engagement]. Table 3-4 illustrates examples of a goal and objective from each category. It is clear from each of the stated goals that the objective is for institutions to change (ideally by improving) over time. That is, an institution may have 50 percent of its employees currently making sustainable compensation and STARS puts forth the goal of working toward 100 percent.

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[11] To be clear, the mission component, as defined here, is not explicitly part of the STARS literature. This is the author's interpretation of the "ideal" impact of STARS.

Table 3-4: Goals and Objectives

Category: Subcategory	Goal	Objective
Education & Research: Curriculum	*Sustainability Learning Outcomes* "help students develop specific sustainability knowledge and skills and provide institutions with goals against which to assess learning" (AASHE, 2011, p. 49)	100% of students graduate with specific knowledge of sustainability defined and measured by the institution
Operations: Climate	*Greenhouse Gas Emissions Reduction* "recognizes institutions that have reduced their net greenhouse gas (GHG) emissions [2005 baseline compared to current year]" (AASHE, 2011, p. 99)	An institution reaches climate neutrality (zero net GHG emissions)
Planning, Administration & Engagement: Human Resources	*Sustainable Compensation* "total compensation (wages plus benefits) for all on-campus workers is sufficient to enable these employees to meet their basic needs" (AASHE, 2011, p. 238)	100% of employees receive sustainable compensation Note: Most quantitatively measured goals in STARS include partial credit as institutions work toward the ultimate goal (e.g. carbon neutrality).

The goals and objectives listed above are considered *outcome* goals and objectives (Jacobs and Kapuscik, 2000). Programs also include *process* goals and objectives that elaborate on how a program is meant to interact with its intended audience (Jacobs and Kapuscik, 2000). Process goals are useful to this evaluation because they help to define how proto-STARS is meant to be used by participants. Simply put, they are necessary in order to measure whether or not schools effectively use the assessment to benchmark and compare accurately. Objectives that measure this goal of meaningful assessment include:

- All nine schools will have a rating by spring 2011;
- Schools communicate results within the group of nine schools;
- The nine schools discuss benefits and/or challenges with the proto-STARS assessment tool;

- The nine schools will determine whether the metric system is useful and should be continued (if permission is granted).

The aforementioned objectives were derived from notes taken at the spring 2010 and fall 2010 Sustainability Group meetings as well as a winter 2011 group conference call. The purpose of this research, given the preliminary stage of the proto-STARS program, is to consider process goals and objectives rather than outcome goals.

Theory of Change

A program's theory of change refers to ideas around the expected results of a program. Weiss (1998) defines theory of change as "a set of hypotheses upon which people build their program plan" (p. 55). The theory of change behind the proto-STARS (and STARS) program consists of the idea that measuring and tracking sustainability practices over time leads to advancement in areas of an institution's environmental, social and economic performance (known as the triple-bottom line in sustainability) (AASHE, 2011). In this situation, when an institution completes the proto-STARS report, receives a rating and shares the results with others, it is likely to want to improve its rating and therefore advance its sustainability efforts. The proto-STARS program benefits from the fact that over 200 colleges and universities have endorsed the rating system by signing up as participants. As boarding schools seek opportunities for assessment and benchmarking, there is an obvious attraction to a system that has been used by numerous intuitions in higher education.

Service Components

The service provided by the proto-STARS program involves use of the STARS' sustainability rating tool and technical manual. In particular, the nine schools were able to access the tool as it was designed for colleges and universities and adapt the assessment categories as the group deemed appropriate for their campuses. The pilot program is available to the nine schools for the foreseeable future. However, after completion in spring 2011 it is possible that the nine schools will have a formal conversation with AASHE staff about the possibility to continue. Conversely, the nine schools may choose to pass up future use of the tool, if it is not deemed appropriate and/or useful for their campuses.

Context

Unlike higher education, there are not a variety of well known measurement tools for campus sustainability in secondary boarding schools. In higher education, tools like the *Green Report Card,* Higher Education 21's *Sustainability Indicators* and the EPA's voluntary *Environmental Management System* have been developed to encourage schools to gather data and generate awareness concerning campus sustainability. That said, both higher education and secondary school campuses have either adopted or are familiar with the US Green Building Council's LEED rating system for building performance. The Green Building Council was one of the early partners with AASHE's development of STARS for a campus wide (compared to building specific) rating system (AASHE, 2009a). As mentioned briefly in the literature review chapter,

there are several "green school" rating programs for secondary schools in the US. However, many focus on the public school sector, so there is not a common tool used by independent boarding schools. Given the campus structure of boarding schools, it is not surprising that a tool such as STARS was attractive to the group of nine schools.

To date, the nine schools are fortunate in that they have been given permission to use the STARS tool without having to pay the user fee that colleges and universities must pay. While the fee was waived, schools still needed to finance work hours spent collecting and synthesizing data. Looking ahead, as schools determine the relative utility of proto-STARS, fiscal support for time spent collecting and synthesizing data as well as a potential registration fee will be an important consideration.

Summary

The proto-STARS program represents a collaborative effort among a group of nine boarding schools to pilot a campus sustainability assessment tool whose design creates a baseline and method of comparison. The chapters that follow describe the methodology used to evaluate proto-STARS, highlight major findings and discuss the implications of those findings.

Chapter 4: Methodology

To examine the early implementation of the proto-STARS program, semi-structured interviews were conducted with the proto-STARS liaisons at each school. Broadly stated, the research analysis considers:

- How was proto-STARS actually used by participants?
- What factors might explain why some participants were able to complete the tool and others were not?

The research process began by soliciting participation from the nine schools. Interviews occurred between February and late March 2011. Additionally, original proto-STARS data were examined to develop a profile of each of the participating schools (e.g. population, square footage, sustainability staffing, etc). Interviews coupled with the proto-STARS data serve as the primary vehicle for understanding the schools' experience with this campus sustainability assessment tool.

Participant Group

Participants in this evaluation include representatives of the full sample of schools involved in the proto-STARS program. That being said, only four of the nine schools completed the assessment fully by the time of this evaluation. Four of the five remaining schools were in the process of finishing the assessment. One school is delaying use of the tool until the 2011-2012 school year. The five partially complete schools were still included in the study because they could respond to some of the questions regarding implementation.

The interviewees in this study are the representatives for the nine schools that have participated in the Sustainability Group for several years. The Sustainability Group is an informal, voluntary collaboration between the nine schools that gathers periodically to share experiences and best practices about campus sustainability initiatives. The proto-STARS project was initiated by this group at their spring 2010 meeting. Since this study if focused on variation within the group, a comparison group was not used.

Evaluation Design

This study's evaluation design is based on the Five-Tiered Approach as described by Jacobs and Kapuscik (2000). The central concept of the Five-Tiered Approach is that programs are not static and that evaluations should be organized at "five levels-moving from generating descriptive and process-oriented information at the earlier stages to determining the effects of programs later in their development" (p. 37). The five tiers of this model are:

- Tier One- Needs Assessment

- Tier Two- Monitoring and Accountability

- Tier Three- Quality Review and Program Clarification

- Tier Four- Achieving Outcomes

- Tier Five- Establishing Impact

The question of implementation addressed in this study falls primarily within the Tier Three level. Specifically, Jacobs and Kapuscik's (2000) Tier Three focuses on a program's "qualities" and whether the information collected helps to describe how the program is actually operating (p. 198). Consistent with

the Five-Tiered Approach's (and any other good researcher's) commitment to using the data collection strategy that holds the greatest promise of generating the information one needs, this investigation is best served by an instrument that allows for qualitative data to be collected and analyzed.

Evaluation Instrument

The survey instrument (see Appendix B) that was designed to obtain information from program participants was a non-standardized semi-structured interview, meaning that the instrument was designed to fit the specific context of the proto-STARS program (Jacobs and Kapuscik, 2000). In many instances, standard measures are developed for program evaluations; these are especially helpful when comparing across groups or over time. Standard measures are also useful in helping to predict reliability in a study. In the case of proto-STARS (and STARS) a standard measurement tool does not exist. For that reason, a non-standardized measurement tool was the only option for this evaluation.

The interview tool addressed three categories of early implementation:

- **Program Use**. Includes descriptive characteristics such as completion rate and proto-STARS rating levels.

- **Implementation Variation.** Considers factors such as how the participants developed their understanding of proto-STARS' program design and how data were collected for the assessment tool.

- **Barriers and Facilitators to Implementation.** Discusses lessons learned from preliminary use of the pilot program.

Specifically, the instrument was divided into four sections: (1) Background Information; (2) Goals and Perceived Effects; (3) Implementation;

and (4) Concluding Thoughts. The background section included information regarding the interviewees' positions at their schools as well as their current proto-STARS ratings. The Goals and Perceived Effects section focused on the participants' participation goals and the initial effects of the proto-STARS pilot program on their campuses. The third section, Implementation, asked participants about how the pilot program was actually implemented on their campuses. The final section, Concluding Thoughts, gave the opportunity to learn about any additional thoughts the interviewees had about the pilot program.

As noted above, a standardized measurement for perceived effects and implementation of campus sustainability assessment programs is not known to exist. That said, in June 2009, AASHE published the results of a survey of its v.5 STARS pilot program. The survey was designed to get feedback on participants' experience with the pilot program. While the goal of this survey was different than the goal of this current research project, the researcher found it appropriate to use some of the same questions in order to compare results across two separate pilot programs should future research on this topic be pursued. A complete version of the interview tool used in this study can be found in Appendix B. The questions that overlap with the 2009 AASHE study include (AASHE, 2009):

- What was your institution's primary goal in participating in the program?
- What were your institution's other goals for participation?
- How well were your goals met by participating?
- What were the primary benefits to your institution's participation in the program?

- What were the primary drawbacks [modified to challenges in this study] to your institution's participation in the program?

Analysis

The interview responses were transcribed into a common document (see Appendix C) prior to analysis. Responses were counted or coded for specific categories and compiled into a series of tables that illustrate the inter-group analysis of implementation of the proto-STARS program. A summary of the lessons learned, as derived from the interviewee responses, is also included in the analysis. A discussion of the major findings from the interviews is included in the following chapter.

Chapter 5: Findings

The primary focus of this chapter is to map and evaluate the program experience of the nine schools with proto-STARS. More specifically, the analysis framework is centered on an inter-group analysis of early implementation of the program. Before delving into an examination of program usage, the first section of this chapter offers a brief consideration of the participants' goals and perception of initial effects of participation in the pilot program. The focus of this section is to contextualize, at a basic level, what the participants planned to achieve by implementing proto-STARS at their school.

The second, and more involved, area of analysis relates to implementation of the pilot program within the group and is organized into three distinct categories. The first is a descriptive comparison related to how the program was used across the nine schools. The second moves on to examine strategies involved in data collection and program usage strategies within the group. Finally, the third section is a consideration of the lessons learned from implementation of the proto-STARS tool. The previously described early implementation analysis framework addresses two primary questions. First, how was the program actually implemented on campuses? Second, what factors might explain why some participants were able to complete the tool and others were not?

Goals and Perceived Effects

Interviewees were asked three main questions related to goals and perceived effects of participation in proto-STARS:

- Q7: From your understanding of the STARS program, what would you list as the general goals of the program?

- Q8: What was your primary goal in participating in the proto-STARS program?

- Q27: From your perspective, has anything changed on your campus regarding the sustainability program/initiatives as a result of participating in the pilot program?

Four key points emerged from analysis of the responses regarding program participation goals. First, all the interviewees correctly understood the STARS assessment to be a method of measurement for individual campuses and facilitating comparisons across institutions. Second, the format of STARS provides a common language that promotes communication on and across campuses. That is, the STARS rubric helps identify key areas of programming and operations related to campus sustainability. Third, schools chose to participate in proto-STARS because the tool could help identify core strengths as well as areas in need of improvement. Fourth, proto-STARS could serve as a resource for benchmarking and assist with the process of mapping out future efforts.

Significantly, the primary goals named by proto-STARS coordinators reflect the *process goal* rather than the *outcome goal*, as defined by Jacobs and Kapuscik (2000). In short, the stated understanding of the goal of STARS and reasons for participating in proto-STARS closely match the process goal (to "measure whether or not schools effectively use the assessment to benchmark and compare accurately") defined in Chapter Three. One point of future consideration will be whether or not the nine schools find proto-STARS useful

enough to continue serving as a benchmark over time. In other words, will interest or perceived usefulness in the assessment tool recede after initial findings are observed? From an outcome goal perspective, STARS was designed to be utilized by campuses until they reach and sustain a program at the platinum level (i.e. reach the highest level for most of the credits in all three categories of the assessment).

While it is too early in this program's development to measure actual effects of participation, an initial observation of outcomes as perceived by the participants is useful. Of the four schools that completed the assessment, responses to the question, "from your perspective, has anything changed on your campus regarding the sustainability program/initiatives as a result of participating in the pilot program?" ranged from a "not yet" to a definitive "yes" with one responding "somewhat" (see Table 5-1).

Table 5-1: Perceived Effects

Yes	The report allowed for deliberate education with staff and new members of the community. It built upon past efforts to "measure" sustainability and produced much better record keeping. It also increased conversations around sustainability.
	The STARS report facilitated a curriculum review, development of green building policies and refining the peer-to-peer education program.
	With STARS, it seems as though decision makers are more attuned to the recommendations of the Task Force because of the expertise behind the assessment tool and the understanding that the initiatives recommended therein are on the radar of colleges and universities.
Somewhat	Completion of the assessment has opened up discourse of sustainability in more ways than past initiatives; however, the impact of increased discourse has yet to be realized.
Not Yet	There may be the possibility for change once the heads meet to discuss STARS and conversations happen around the future of the program.

There were two distinct categories of change reported by the participants that pointed to definitive change within their sustainability program as a result of

implementing proto-STARS. The first type of change relates specifically to programming, such as the statement that the assessment report led directly to a review of the curriculum. The second form of change highlights the more abstract notion of opening new lines of communication among various groups on campus that might later result in actual change in the school's program and policies. In other words, it is possible to speculate that future research might illustrate that the proto-STARS has the ability to facilitate both action-oriented-change (curriculum review) and process-oriented-change (a conversation starter).

As stated earlier, the conclusions of the research question related to goals and perceived effects are limited. There are two main challenges with the assessment of perceived effects of the proto-STARS program. First, several of the schools had little time between completion of the assessment and the evaluation interview. Second, only four of the nine had fully completed the assessment prior to the deadline of this evaluation. For these reasons, it will be important to re-examine perceived effects of the program once all the schools have finished the assessment and there has been some time allowed for the coordinators to test the impact of the assessment on their campuses.

Program Use

As described in the introduction to this chapter, the major focus of this evaluation's findings rests on an examination of early implementation. The first area of implementation to consider is the basic descriptive characteristics of proto-STARS completers and non-completers including: completion rate, proto-STARS rating levels, personnel characteristics and institutional characteristics.

To aid the following analysis, portions of the profile table included in Chapter Three will be used to illustrate the inter-group comparison. There were several questions from the interview tool that informed this analysis; specific attention will be drawn to the following:

- Q1: Please describe your position at your campus as it relates to campus sustainability?

- Q2: How long have you held this position on your campus?

- Q4: Is your work in sustainability recognized in your employment structure (ie % Full Time Equivalent)? If so, what % FTE?

- Q5: Please describe the timing of STARS within your school's sustainability program? For example, STARS was one of the first programs the sustainability program engaged in. Or, STARS took place after several years of sustainability related programs at my campus?

- Q6: As of this date, what is your school's STARS rating level?

In addition to survey data from the interviews, profile data, including number of students, building square footage, square footage added since 2005, number of buildings and endowment value, will be considered to determine if there are any relationships between completion rate and the schools' profile characteristics.

Table 5-2 shows preliminary information about the completion rate and initial scores for proto-STARS participants. While participation in the pilot program was voluntary, it was the intention of the group that all nine schools would complete the tool prior to the April 2011 meeting of the heads of schools where the pilot program will be discussed. As demonstrated by Table 5-2, four of the nine schools completed the tool within the agreed upon timeline and

calculated their proto-STARS rating level. Four other schools are in the process
of completing the assessment but are not yet reporting a rating. One has not
started using the tool but aims to begin the assessment in the fall of 2011.

Table 5-2: Proto-STARS Rating Overview

	Student Pop.	Bldg. Sq. Ft. (million)	# Bldgs.	Endow. Value (million)	% FTE	Yrs. in Job	Proto-STARS Rating	% Points/ Category
A	1,111	1.8	155	$695 (as of 6/10)	.5	3-4	Bronze	ED: 32% OP: 32% PAE: 45%
B	394	.5	40	$85 (as of 3/11)	.25	3-4	Silver	ED: 68% OP: 36% PAE: 44%
C	831	1.2	121	$240 (as of 6/10)	~.25	3-4	Partially Complete	--
D	620	1	90	$314 (as of 6/10)	.5 (split btwn 2 people)	<3	Partially Complete	--
E	1,000	1.5	130	$860 (as of 8/10)	1.0	5+	Bronze	ED: 38% OP: 17% PAE: 45%
F	597	1.1	81	$360 (as of 1/11)	1.0	<3	Not Started	--
G	800	1	119	$360 (as of 3/11)	1.0	5+	Partially Complete	--
H	650	--	35	$112 (as of 9/10)	~.25	3-4	Partially Complete	--
I	535	1.2	112	$381 (as of 6/10)	1.0	3-4	Silver	ED: 46% OP: 37% PAE: 53%

Profile data collected from proto-STARS data, interview results, personal communication & school websites.

Proto-STARS Rating Levels

A deeper examination of the interview results points to some interesting
observations regarding the characteristics of the four schools that reported a rating
level (see Table 5-2). Most obvious is that the ratings were split evenly with two
each reporting at the bronze and silver level. Among the three categories,

Education, Operations and Administration, all four of the schools scored lowest

(or tied for lowest, the case of school A) in the Operations section (see Appendix

A for a list of credits included in this section). The lower score in the Operations

section matches the trend among the 50 institutions currently reporting STARS

ratings where the average is just over 30% (AASHE, 2011). This observation is

not overly surprising given the section's emphasis on quantitative data and large

percentage of credits dedicated to emission reductions. School B claimed the

highest overall score with 68% of points possible in the Education section.

Notably, this school was the first to complete the assessment system and has

actively used the tool to engage the school community in action-oriented projects

related to sustainability. The lowest overall score was reported by school E in the

Operations section partly because of difficulty with accurate data collection, a

major challenge for assessing the credits. An important observation from the

scores of the reporting schools is that schools have different strengths and

weaknesses, and the reporting tool and rating system seeks to accurately represent

those characteristics. Moreover, a low percentage in one area does not undermine

an institution's opportunity to receive an initial rating.

In addition to considering the reporting scores for the proto-STARS

assessment, it is useful to examine the characteristics of the program coordinators

for each of the four schools. One of the most interesting observations is that staff

support seems unrelated to completing the assessment; schools with full time

sustainability coordinators/directors were no more likely to have done so, on time,

than were schools without full time staff. In fact, the four reporting schools

represent the three distinct categories of sustainability staffing: full time, part-time or course release equivalent (those at ~25%).

While it is useful to examine the potential factors influencing the rating levels of the four schools that reported a proto-STARS rating, it remains important to consider whether there are any factors that might have contributed to the less than fifty percent completion rate by proto-STARS participants. The following two sections broaden the analysis of descriptive characteristics of proto-STARS participants to a comparison of completers and non-completers in two areas: personnel characteristics and institutional characteristics.

Personnel Characteristics of Completers and Non-Completers

To more closely examine factors that might be common among the group of completers versus the non-completers, it is important to examine the personnel characteristics of the two groups. The four characteristics examined in this section are staffing allocation (% FTE), number of years in the position, position title and timing of proto-STARS within the program's history. Table 5-2 provides information for the proto-STARS completers. One commonality among the schools that completed the assessment is that the four reporting participants have held their current position for at least three years. Similarly, all four of the reporting schools' participants hold the position of sustainability coordinator/director. As mentioned in the previous section the range of staffing allocation for the four reporting schools ranges from .25 to 1 which represents the full range of staffing possibilities across the entire participant group. While the coordinator at School B has held the position of sustainability coordinator for

several years, the participant noted that proto-STARS represented one of the first major initiatives of the school's sustainability program. The other three schools reported that proto-STARS took place after several years of sustainability initiatives at their schools.

Table 5-3: Proto-STARS Completers: Personnel Characteristics

School	% FTE	Years in Position	Position Title	Timing of Program
School A	.5	3-4	Coordinator/ Director	After several yrs. of programming
School B	.25	3-4	Coordinator/ Director	One of first initiatives
School E	1	5+	Coordinator/ Director	After several yrs. of programming
School I	1	3-4	Coordinator/ Director	After several yrs. of programming
Average	*.7*	*3-4*	*NA*	*NA*

Table 5-4 includes personnel characteristics of the five schools that did not complete the proto-STARS assessment. Similar to the proto-STARS reporters, the percent FTE among the non-reporters ranges from .25 to 1. Unlike the four reporting schools, two of the five non-complete participants have held their position for less than three years. Notably, School D reported a staffing change during the middle of the proto-STARS timeframe. Specifically, the position went from one person, who had been at the school for several years, to two faculty members (.25% FTE each), who were both in their first year of working at the school. School D was also the only non-completer to report that proto-STARS was one of the first campus-wide initiatives of the sustainability program. Of the five non-completers, only School F holds a senior administrative position rather than sustainability coordinator/director. Interestingly, School F is also the school

that opted to delay using the proto-STARS tool until the fall of 2011. When asked to explain why the implementation was delayed, the interviewee responded that the school had recently invested significant time in strategies planning around sustainability related initiatives and that investing time in the assessment might take away from time available to pursue those recent efforts.

Table 5-4: Proto-STARS Non-Completers: Personnel Characteristics

School	% FTE	Years in Position	Position Title	Timing of Program
School C	.25	3-4	Coordinator/ Director	After several yrs. of programming
School D	.5	<3	Coordinator/ Director	One of first initiatives
School F	1	<3	Dean	After several yrs. of programming
School G	1	5+	Coordinator/ Director	After several yrs. of programming
School H	.25	3-4	Coordinator/ Director	After several yrs. of programming
Average	*.6*	*3-4*	*NA*	*NA*

Overall there are not considerable differences in the personnel characteristics across completers and non-completers. There is a slight distinction between the two groups' average percent FTE, .7 for the completers compared to .6 for the non-completers. While the average time in the position was the same for both groups, three years, it is worth highlighting that all four completers have held their position for at least three years.

Institutional Characteristics of Completers and Non-Completers

In addition to considering the staffing characteristics of proto-STARS completers and non-completers, it is useful to examine the two groups by a set of common institutional characteristics. This section considers the two groups by student body size, building square footage, square footage added since 2005,

number of buildings and endowment value to see if there are any distinguishing factors that might have an influence on completion rates.

Table 5-5 illustrates the institutional characteristics of the four schools that completed the proto-STARS assessment. The student population among the completers ranges from 394 students (School B) to 1,111 students (School A), representing both the smallest and largest student population of all nine participants. Schools A and B also share the greatest difference in overall square footage, square feet added since 2005 and number of buildings. School A maintains the largest overall building footprint, 1.8 million square feet. Interestingly, even though School B added the greatest number of square feet since 2005, by 73,000, its overall square footage amount still represents less than half of the other three completers. School E maintains the largest endowment with a value of approximately $860 million dollars compared with School B which maintains an $85 million dollar endowment, a difference of $775 million.

Table 5-5: Proto-STARS Completers: Institutional Characteristics

School	# Students	# Sq. Ft. (Million)	# Sq. Ft. Added Since 2005	# Buildings	Endowment Value ($ Million)
School A	1,111	1.8	19,140	155	695
School B	394	.5	73,088	40	85
School E	1,000	1.5	21,250	130	860
School I	535	1.2	24,457	112	381
Average	*760*	*1.3*	*34,484*	*109*	*505*

The same set of institutional characteristics was examined for the five schools that did not complete the proto-STARS assessment. Table 5-6 provides an overview of the different characteristics. Of the non-completers, School C has the largest student body at 831 students, maintains the largest building footprint (1.2 million square feet) and has the largest number of buildings. School F has the smallest student population of the non-completer group and has added the largest amount of square feet (of the three schools where information was provided on square feet added). School H operates with the smallest number of buildings though information was not provided on its overall square footage. That being said, it is not possible to determine if the overall building footprint is more or less than the other four schools in this group. School F and School G both report an endowment value of $360 million. School H's endowment value is the smallest of the non-completers at $112 million.

Table 5-6: Proto-STARS Non-Completers: Institutional Characteristics

School	# Students	# Sq. Ft. (Million)	# Sq. Ft. Added Since 2005	# Buildings	Endowment Value ($ Million)
School C	831	1.2	64,567	121	240
School D	620	1	--	90	314
School F	597	1.1	90,000	81	360
School G	800	1	40,000	119	360
School H	650	--	--	35	112
Average	*670*	*1.1*	*64,856*	*89*	*277*

A comparison across the two groups, using averages of completers and non-completers, shows two primary differences in institutional characteristics.

The first difference is that the average endowment value for the proto-STARS completers is nearly twice as large as the average of the non-completers ($505 million compared to $277 million). The second difference is in the average size of the student body across the two groups. The completers' average student body size is just over one and a quarter the size of the non-completers'. It is important to note that there is also considerable difference in reported square feet added since 2005 between the two groups. In this case it is the non-completers that have added considerably more square footage since 2005 than the completers. However, it is important to note that two of the five non-completers did not provide information on square feet added so caution is needed when drawing conclusions about the completers' and non-completers' characteristics.

Implementation Variation

The analysis of program implementation is deepened through an examination of variation in how the program was utilized by the completers and non-completers of proto-STARS. While only four of the nine schools reported a proto-STARS rating within the pilot program's timeframe, four other schools were partially complete. The ninth school, School F, is excluded from this section, as the participant did not begin the assessment within the given timeframe. There were several questions in the interview tool that provide useful insights into the implementation process of the proto-STARS program:

- Q 9: What was the primary way that you developed your understanding of the STARS program's goals?

- Q 15: Approximately how many hours would you say you spent collecting and synthesizing data for the assessment?

- Q17: Please describe the one primary way proto-STARS data were collected at your campus?

- Q 18: In your assessment, what year did you use for the "performance year"?

- Q 19: Were you able to establish a 2005 baseline where necessary?

- Q21: Has your campus participated in a comprehensive sustainability assessment other than proto-STARS?

- Q22: Have you attended Sustainability Group meetings and/or participated in conference calls of the nine schools regarding proto-STARS?

The analysis on variation in program usage is split into two categories. First, questions of implementation support (questions 9, 21 and 22) will be compared between the completers and non-completers. Second, questions related to actual data collection (questions 15, 17, 18 and 19) will be examined between the same two groups.

Implementation Support among Completers and Non-Completers

Implementation support of the proto-STARS programs refers to variables that might have impacted the way in which a school used the assessment tool. Specifically, this section considers how the participants developed their understanding of the proto-STARS program, whether or not they had access to a prior sustainability assessment and whether or not they participated in the nine schools' Sustainability Group's meetings and conference calls.

Of the four reporting schools, there was a degree of consistency across the three categories (see Table 5-7). All four participants reported that they

developed their primary understanding of the tool through the STARS Technical

Manual. Similarly, all the participants took part in the meetings and conference

calls where proto-STARS was discussed. The distinction among the reporting

schools lies with whether or not a sustainability assessment had been previously

completed. Schools A and E reported conducting a prior assessment while

Schools B and I did not.

Table 5-7: Proto-STARS Completers: Implementation Support

School	Developed Understanding of Program	Completed Previous Sustainability Assessment	Participate in Sustainability Group
School A	Technical Manual	Yes	Yes
School B	Technical Manual	No	Yes
School E	Technical Manual	Yes	Yes
School I	Technical Manual	No	Yes

Table 5-8 considers the same three criteria for the four schools that

partially completed the assessment report. Of the non-completers, three of the

four participants reported that the primary way they developed an understanding

of the assessment tool was through talking with other members of the

Sustainability Group. Similar to the completers, half of the schools had

conducted a prior sustainability assessment and half had not. Three of the four

participants reported attending proto-STARS related meetings of the

Sustainability Group. It is useful to note that School D's sustainability

coordinator, who did not report participating in meetings, is also the school that

underwent a staffing change halfway through the pilot project. School D's

previous sustainability coordinator did participate in the initial meetings (during spring 2010) regarding proto-STARS.

Table 5-8: Proto-STARS Non-Completers: Implementation Support

School	Developed Understanding of Program	Completed Previous Sustainability Assessment	Participate in Sustainability Group
School C	proto-STARS Group	Yes	Yes
School D	Technical Manual	No	Sometimes
School G	proto-STARS Group	No	Yes
School H	proto-STARS Group	Yes	Yes

Looking across the two groups there are more similarities than differences in the categories of implementation support. The major difference between the groups is that three-quarters of the non-completers reported that they developed their primary understanding of the tool through communication with other program participants while all four of the completers cited the STARS Technical Manual as the primary resource. This difference might be explained by the fact that once a few schools had used the tool and worked with the Technical Manual, the remaining schools saw their experience as a valuable resource for their implementation process. While this form of information seems to be reflected in the fact that seven of the eight schools reported participating in the group's meetings, an area of potential concern may be misinformation. If the four reporters misunderstood the Technical Manual then the entire group could use the assessment system inaccurately. Since proto-STARS is a pilot program impacting only these nine schools, a consistent understanding of the assessment tool is useful. That being said, since the group was given permission to adjust the

program to secondary boarding schools as needed, a strict interpretation of the Technical Manual (or even the program itself) might be harder to achieve given this allowed interpretational flexibility. Since both groups reported a fifty-percent rate of completing a prior assessment, the role of a prior assessment did not appear to influence the ability of a school to complete the assessment.

Data Collection among Completers and Non-Completers

In addition to examining how the schools used support methods to inform the implementation of proto-STARS, it is important to consider actual data collection practices across the two groups. This section considers four elements of data collection: primary data collection method, time spent collecting data, performance year used in the assessment report (important for categories like solid waste reduction) and the ability to establish a 2005 baseline (necessary in order to establish greenhouse gas emissions reduction).

Table 5-9 offers a synthesis of the above variables for the group of proto-STARS completers. The completers' data collection methods represent a wide range of options, from an individual to a committee approach. Of the three schools that reported hours spent collecting data, School A and School E both reported that somewhere between 60-80 hours were spent while School I reported a larger number, at over 81 hours. Interestingly, of the two schools that reported 60-80 hours, School A split that time across just two people whereas School E's collection time extended across a committee of thirteen members. School I, where the individual reported spending over 80 hours, represents the largest number of hours spent. While hours spent collecting data varies, a common

response that emerged from all four schools was that the majority of the time was spent educating themselves about what each credit was asking for and finding out if their school collected the necessary information. In other words, the actual data reporting was not the most time consuming, but rather it was the information gathering stage of the implementation process.

Two schools, A and I, reported using fiscal year 2010 as the performance year for the assessment report. Both School B and School E noted that a combination of performance years was used to complete the assessment report. All four reporting schools were able to calculate a 2005 greenhouse gas emissions baseline for the emissions reduction credit in the Operations category.

Table 5-9: Proto-STARS Completers: Data Collection

School	Data Collection Method	Hours Spent	Performance Year Used	2005 Baseline
School A	2-3 people worked together	60-80	FY 10	Yes
School B	Individual	Not Sure	Mix of FY 10 & FY 09	Yes
School E	Committee	60-80	Mix of FY 09 & FY 08	Yes
School I	Individual	81-100	FY 10	Yes

Table 5-10 illustrates that there was less complete data available for collection strategies among the four non-completers. First, it is important to note that the non-completers could not report on hours spent collecting data since the assessment was not yet complete at their school. Two schools, C and D, reported that information was collected by a small group of two to three people. Both participants G and H collected data individually. Participants at schools G and H reported using fiscal year 2010 as their performance year baseline while C and D were not able to provide information on the performance year used. Half of the

non-completers, School D and School G, have not been able to establish a 2005

baseline for emission comparison over time.

Table 5-10: Proto-STARS Non-Completers: Data Collection

School	Data Collection Method	Hours Spent	Performance Year Used	2005 Baseline
School C	2-3 people worked together	*NA*	--	Yes
School D	2-3 people worked together	*NA*	--	No
School G	Individual	*NA*	FY 10	No
School H	Individual	*NA*	FY 10	Yes

Across the two groups, completers and non-completers, the major

distinction in data collection rests upon the ability to obtain quantitative data over

time. Most striking is the fact that all four proto-STARS completers developed a

2005 emissions baseline compared to only half of the non-completers. While a

2005 baseline is not necessary in order to participate in proto-STARS, the

greenhouse gas reduction credit in the Operations section is worth up to fourteen

points, more than any other credit in the entire assessment. Without a 2005

baseline a school cannot claim any points toward a reduction. In other words,

AASHE has made the argument that moving toward a reduction in overall

emissions is an important component of a more sustainable campus. More

specifically related to completion rates, the fact that only two of the non-

completers have established the 2005 baseline suggests that access to historical

energy use data might be a contributing factor to a school's tendency to complete

the assessment tool.

Facilitators and Barriers to Implementation

In considering the findings from the implementation portion of this program evaluation, it is important to deepen the analysis with a consideration of the key factors that either supported or limited the initial implementation of the proto-STARS tool.

Facilitators

- **Multi-Stakeholder Process**. The assessment can be completed in a variety of ways- from an individual coordinator to committee effort. In any case, it remains a multi-stakeholder initiative. In the interview participants were asked about people who assisted with data collection for the proto-STARS report. At the very least it seems necessary to have a point person from the (1) academic program, (2) the facilities department and (3) the business office involved in collecting information directly or looking over the information to ensure data accuracy. Some of the interviewees also indicated that coordinating with a representative from the dining operation was important to completing the assessment.

- **Intergroup Collaboration.** Perhaps the most important role of the group meetings regarding program implementation was the gathering held by the reporting schools in early winter 2011 where the group edited the original STARS credit list to reflect the modified proto-STARS credits (see Appendix A). This modification was adopted by the group for the remainder of the pilot phase though it is sure to be a point of clarification should the group decide to

continue working with the assessment system. More broadly speaking, all of the interviewees clearly expressed support for the program's goal of joint participation in proto-STARS. In addition to using the meetings to maintain support for the program, the gatherings served as an important time for information sharing and implementation advice for the eight schools engaged in the assessment.

- **Flexibility.** There are a variety of methods by which to approach completion of the assessment report. However, in the end, each campus ends up with a common set of metrics and understanding of those metrics. This flexibility component is very useful given that no campus culture is exactly the same and there are a variety of ways in which an institution can approach the goal of becoming more sustainable. Moreover, the assessment report has various uses on campuses from serving as the foundation for a strategic plan, providing an educational tool for the community or determining the next steps in a particular area of campus sustainability.

- **Communicating Results**. A common consideration raised by proto-STARS participants was along the lines of "what next?" In other words, once the assessment data are collected, how and with whom should it be shared? A few of the schools have a specific audience in mind and are in the process of considering the most useful parts of proto-STARS to share with that specific audience. One school is working on designing a presentation for students so that they can begin to understand the criteria included in proto-STARS as well as their school's rating in different categories. Another school is focusing on

how the results from proto-STARS will be useful in steering conversations among a committee that includes trustees, students, faculty and local community members. Still others are unsure of who the primary audience will be and along what timeline information should be shared. While it was not in the scope of this research to carefully examine the "what next" factor, it seems clear that the participants were invested in collecting proto-STARS information for use on their individual campuses well as to have a common set of information to share with the Sustainability Group. In short, intended audiences aside, it is clear that the nine intend to continue collaborating and sharing assessment information.

Barriers

- **Information Gaps**. Many schools expressed the sentiment that their current proto-STARS rating reflects a "first pass" with the information. For example, there may be some credits where the school deserves points, but it was not possible to engage the appropriate key informant. School A and School G, for example, explained that the endowment credits were intentionally passed over in their report because they felt their institution's financial department was not a point where it would be willing to discuss investment practices. There were also examples of the assessment serving as the starting point for tracking certain information so the coordinator will be able to include it in future versions of the assessment. School I described using the Education credit for identifying sustainability in the curriculum as a way to facilitate a process whereby the teaching faculty adopted a common understanding of the term for

their classes. Once a common definition was agreed upon the school could begin better tracking which qualified for "Sustainability Focused" and "Sustainability Related" courses.

- **Accurate Data**. The previously mentioned example from school E represents the challenge of collecting information for the proto-STARS tool in the face of inaccurate data. In the case of school E, it was discovered that information provided by the school's solid waste hauler did not accurately reflect the school's actual waste production. While this discovery limited the school's ability to report on credits in the Operations section of proto-STARS, it can be argued that one of the values of the quantitative assessment tool is that it helps to address areas on a campus that might benefit from a more rigorous data collection system.

- **Initial Investment.** The less than fifty-percent completion rate suggests that finding the time to gather the appropriate information was a challenge for many participants. The timing issue is particularly relevant for the first time use of the assessment. Several schools noted that future updates would not be as difficult as the initial assessment because many credits are likely to remain constant over time and stakeholders know which information is important to keep track of for future versions. An example of such credit is that once a school develops (or if it already has) a definition for sustainability within the curriculum it will automatically receive credit in future updates of the assessment.

Discussion

The focus of this discussion seeks to consider patterns that may explain differences in implementation between the proto-STARS completers and non-completers. The analysis in the previous sections on implementation suggests only limited indications as to why less than half of the proto-STARS participants reported a rating within the pilot program's timeline.

While there was little difference between the personnel characteristics of reporting and non-reporting participants, a note on the time in the position is worth discussing briefly. One advantage of holding the position for more than three years and having implemented previous sustainability projects is that the position (and completion of proto-STARS) necessarily involves knowing contacts within various departments at a school. In other words the work of campus sustainability is inherently collaborative not only in regards to the areas of campus involved but also because there is, as the proto-STARS system illustrates, a combination of data collection and interpersonal relationships that is necessary in order to effectively measure campus practices.

The section on institutional characteristics saw two noteworthy points. First, the average endowment value among the completers was substantially higher than the non-completers. While this trend seems interesting at the surface, it is important to point out that that four reporting schools represent the full spectrum of endowment values, from $860 million to $85 million, across the entire group of nine schools. To comment more extensively on the potential relationship between a commitment to sustainability assessment and endowment

value is beyond the scope of this research but is certainly a topic worth considering in future research.

The second area of distinction is that, on average, non-completer campuses have added considerably more building square footage since 2005 than reporting campuses. Again, more research is needed to determine a possible explanation for this observed relationship. In future research it will be important to consider how building trends relate to a school's approach to sustainability programming. One important fact to consider is the trend of increasing built space on campus and the relationship to energy consumption. As schools consider future goals for emissions reduction and energy conservation, they will continue to run into a challenge of reducing energy in the face of increasing square footage. None of schools that reported information on square footage noted an overall reduction in square footage, an action that could be seen as a step toward reducing a school's environmental impact. The trend toward increasing campus square footage is common not only among proto-STARS group but reflects a general trend across many college and university campuses across the United States (Carlson, 2009).

The most notable difference between completers and non-completers in the area of data collection is that the non-completers were less likely to have a clear sense of either the performance year data or 2005 baseline for greenhouse gas emissions. While these two variables only indicate a small fraction of the quantitative data needed to complete the assessment, it is useful to point to the fact that establishing a system for data collection might be an important factor in a

school's ability to complete a sustainability assessment such as proto-STARS. A school's system to collect and track data over time does not mean that the campus necessarily operates more sustainably than an institution that does not have similar mechanisms in place. The ability to obtain data, such as a 2005 emissions baseline, simply suggests that a school is more organized to report data. That said, many of the participants pointed to the fact that having a mechanism to track data over time is critical to gauge the effectiveness of sustainability efforts at their institution.

Taking a holistic approach to the various factors examined to attempt to determine why less than half of the proto-STARS participants completed the assessment tool leaves one with more questions than answers. However, one possible explanation for the existence of completers and non-completers might simply be a factor of individual campus circumstances. School F, as discussed earlier, decided intentionally to delay use of the tool until fall 2011 because of competing priorities with other sustainability programs. Conversely, School E noted that proto-STARS was started a perfect time in order to assist the school's sustainability committee to draft a strategic plan for moving forward with the sustainability plan. School D underwent a staffing change in the middle of the program implementation. While these factors do not necessarily explain clear cause-and-effect related to completion rates, failure to acknowledge individual circumstances would limit the analysis of completion rates.

It is also important to consider one of the reflections highlighted in the Facilitators and Barriers section of this analysis, the fact that completing the

proto-STARS assessment takes a considerable amount of time at first pass. While the findings do not indicate that staffing allocation impacts a school's ability to complete the assessment, it is worthwhile to consider that it is likely that participants were not given specific release time from their other responsibilities to complete the assessment. Related is the fact that the assessment includes a large number of credits. While it seems likely that AASHE would argue for the necessity of having a comprehensive number of categories, it will be useful and important for future research to consider whether the tool can be streamlined in future iterations in order support completion of the most crucial categories as determined to impact campus sustainability.

Chapter 6: Conclusion

Proto-STARS represents a pilot project of AASHE's STARS program that was conducted primarily from spring 2010 through spring 2011. The previous chapters provide context for the development of proto-STARS, a detailed description of the pilot program and an analysis focused on implementation variation across the group of completers and non-completers. The following sections conclude this evaluation by discussing the future of proto-STARS, highlighting limitations of this research and offering final thoughts.

Considerations for the Future of proto-STARS

As stated in the Methods chapter of this study, a primary purpose of this preliminary evaluation is to provide clarification regarding early implementation of the pilot program. By collecting a detailed history and description of the proto-STARS program as well as an initial review of the implementation, more useful information could be provided to allow for the evolution of the program. Should the nine schools and AASHE decide that future iterations of proto-STARS will occur, there are several important questions to consider:

- Will participation continue at the group level or will each school decide individually whether or not to participate?

- If the group continues to participate together, is it appropriate to set a common goal for all the campuses (e.g. all nine campuses should aim for a Silver rating)? If so, what sort of institutional commitment would be necessary to formalize that goal?

- What will future timelines for participation look like? Will schools report yearly, every three years, other?

- Will secondary schools be required to report publically like colleges and universities? If so, will that requirement change the nine schools' willingness to participate?

- Will there be a fee associated with future use of the assessment tool?

- Is the modified credit list appropriate for secondary schools? What, if any, changes should be made? Also, who makes the final decision about what credits are required?

- Will proto-STARS be available to other secondary schools?

The preceding questions are not intended to be an exhaustive list of considerations for the future of the proto-STARS program at the nine schools (or beyond), but rather a point of departure for future planning. The point to underscore is that it will be important to establish a formal process for deciding on the next step for the proto-STARS program. One indication that that group will make such a commitment is a scheduled discussion of proto-STARS during the group's May 2011 meeting.

Limitations

There were several limitations to this evaluation. Perhaps most limiting was the fact that the timeline for completing proto-STARS and the timeline of this research did not align exactly. That is, one school plans to complete the assessment in fall 2011 and therefore its results are not available. It was possible to gather information regarding background and goals for all participants. However, perceived benefits were not available for five schools because they are still completing the assessment. A second timeline issue came from schools completing the tool at different times throughout the year. Varied completion

dates meant that some interviews took place after a school had several months to work with the completed assessment while others had just finished at the time of the interview. In short, some schools had more time to reflect on the implications of proto-STARS.

Another limitation of this study was that only one person was interviewed at each school. Subsequent examinations might consider including several key players involved in the completion of the assessment. Responses from the interview indicated that there were at least three people closely involved in the data collection and/or synthesis for each school.

Finally, the primary investigator in this evaluation was also closely involved with the Sustainability Group and assisted with the proto-STARS program at one of the nine schools (prior to the creation of this evaluation research). The researcher worked to keep personal bias out of the study by only representing views and information explicitly referred to in the interviews. That being said, interviewees might have answered questions in the way they thought the interviewer expected or would consider "most accurate."

Concluding Remarks

While it is too soon to predict the effects of either STARS or proto-STARS, clearly the tool addresses what Shriberg (2004) identifies as an important need for campus sustainability programs. The author states, "campuses require methods of comparison to each other as well as to a vision of a 'sustainable college or university' to ensure and affirm that they are moving in the right (or wrong) direction" (p. 72). This evaluation report contributes to preliminary

research on the role of STARS in the evolving field of campus sustainability. Specifically, this research examines a deliberate effort by nine peer campuses to sample the newest iteration of sustainability assessment tools within an agreement that kept collaboration and transparent information sharing at its forefront.

It is important not to draw too sweeping a conclusion from the proto-STARS evaluation. Proto-STARS draws from the strengths of the STARS data collection framework and reporting system; proto-STARS perhaps sets a model for other campuses sustainability in its deliberate focus on collaboration and information sharing from the earliest phase of implementation. To be clear, a working group of nine schools significantly departs from the STARS framework of over 250 colleges and universities. Given that academics and scholars generally agree that STARS is in its early stages of development, it is safe to say that proto-STARS is in its infancy.

All of this is to say that this program evaluation was designed to provide a snapshot of proto-STARS at its earliest phase. Given this program evaluation it will be interesting to chart how schools work independently and collaboratively in years to come.

Appendix

Appendix A – Credit Checklist

STARS 1.0 Credit Checklist (Proto-STARS Dec 2010)
* credit does not apply to all institutions

Category 1: Education & Research (ER)		
Credit Number	**Credit Title**	**Possible Points**
Co-Curricular Education		
ER Credit 1	Student Sustainability Educators Program	5
ER Credit 2	Student Sustainability Outreach Campaign	5
ER Credit 3	Sustainability in New Student Orientation* (yes proto-STARS)	2
ER Credit 4	Sustainability Materials and Publications	4
Tier Two	*Co-Curricular Education Tier Two Credits (yes proto-STARS)*	2
Curriculum		
ER Credit 5	Sustainability Course Identification	3
ER Credit 6	Sustainability-Focused Courses	10
ER Credit 7	Sustainability-Related Courses	10
ER Credit 8	Sustainability Courses by Department* (yes proto-STARS)	7
ER Credit 9	Sustainability Learning Outcomes*	N/A proto-STARS
ER Credit 10	Undergraduate Program in Sustainability*	N/A proto-STARS
ER Credit 11	Graduate Program in Sustainability*	N/A proto-STARS
ER Credit 12	Sustainability Immersive Experience* (yes proto-STARS)	2
ER Credit 13	Sustainability Literacy Assessment	2
ER Credit 14	Incentives for Developing Sustainability Courses	3
Research		
ER Credit 15	Sustainability Research Identification*	N/A proto-STARS
ER Credit 16	Faculty Involved in Sustainability Research*	N/A proto-STARS
ER Credit 17	Departments Involved in Sustainability Research*	N/A proto-STARS
ER Credit 18	Sustainability Research Incentives*	N/A proto-STARS
ER Credit 19	Interdisciplinary Research in Tenure and Promotion*	N/A proto-STARS
	Total	55

	Category 2: Operations (OP)	
Credit Number	**Credit Title**	**Possible Points**
	Buildings	
OP Credit 1	Building Operations and Maintenance	7
OP Credit 2	Building Design and Construction* (varied for proto-STARS)	4
OP Credit 3	Indoor Air Quality	2
	Climate	
OP Credit 4	Greenhouse Gas Emissions Inventory	2
OP Credit 5	Greenhouse Gas Emissions Reduction	14
Tier Two	*Climate Tier Two Credits*	0.5
	Dining Services	
OP Credit 6	Food Purchasing* (yes proto-STARS)	6
Tier Two	*Dining Services Tier Two Credits (2-4, 2-9 varied for proto-STARS)*	2.5
	Energy	
OP Credit 7	Building Energy Consumption	8
OP Credit 8	Renewable Energy	7
Tier Two	*Energy Tier Two Credits*	1.5
	Grounds	
OP Credit 9	Integrated Pest Management* (yes proto-STARS)	2
Tier Two	*Grounds Tier Two Credits (only 2-3 N/A for proto-STARS)*	1
	Purchasing	
OP Credit 10	Computer Purchasing	2
OP Credit 11	Cleaning Product Purchasing	2
OP Credit 12	Office Paper Purchasing	2
OP Credit 13	Vendor Code of Conduct	1
Tier Two	*Purchasing Tier Two Credits*	0.5

	Transportation	
OP Credit 14	Campus Fleet	2
OP Credit 15	Student Commute Modal Split* (varied for proto-STARS)	4
OP Credit 16	Employee Commute Modal Split	3
Tier Two	*Transportation Tier Two Credits (2-1, 2-2 varied for proto-STARS)*	3
	Waste	
OP Credit 17	Waste Reduction	5
OP Credit 18	Waste Diversion	3
OP Credit 19	Construction and Demolition Waste Diversion* (yes proto-STARS)	1
OP Credit 20	Electronic Waste Recycling Program	1
OP Credit 21	Hazardous Waste Management	1
Tier Two	*Waste Tier Two Credits (all apply for proto-STARS)*	1.5
	Water	
OP Credit 22	Water Consumption	7
OP Credit 23	Stormwater Management	2
Tier Two	*Water Tier Two Credits (all apply for proto-STARS)*	1.25
	Total	**99.75**

Category 3: Planning, Admin. & Engagement (PAE)		
Credit Number	Credit Title	Possible Points
Coordination and Planning		
PAE Credit 1	Sustainability Coordination	3
PAE Credit 2	Strategic Plan* (yes proto-STARS)	6
PAE Credit 3	Physical Campus Plan* (yes proto-STARS)	4
PAE Credit 4	Sustainability Plan	3
PAE Credit 5	Climate Plan	2
Diversity and Affordability		
PAE Credit 6	Diversity and Equity Coordination	2
PAE Credit 7	Measuring Campus Diversity Culture	2
PAE Credit 8	Support Programs for Under-Represented Groups	2
PAE Credit 9	Support Programs for Future Faculty	N/A proto-STARS
PAE Credit 10	Affordability and Access Programs	3
Tier Two	*Diversity and Affordability Tier Two Credits*	0.75
Human Resources		
PAE Credit 11	Sustainable Compensation	8
PAE Credit 12	Employee Satisfaction Evaluation	2
PAE Credit 13	Staff Professional Development in Sustainability	2
PAE Credit 14	Sustainability in New Employee Orientation	2
PAE Credit 15	Employee Sustainability Educators Program	5
Tier Two	*Human Resources Tier Two Credits*	0.75
Investment		
PAE Credit 16	Committee Socially Responsible Investment* (yes proto-STARS)	2
PAE Credit 17	Shareholder Advocacy* (yes proto-STARS)	5
PAE Credit 18	Positive Sustainability Investments* (yes proto-STARS)	9
Tier Two	*Investment Tier Two Credits*	0.75

Public Engagement		
PAE Credit 19	Community Sustainability Partnerships	2
PAE Credit 20	Inter-Campus Collaboration on Sustainability	2
PAE Credit 21	Sustainability in Continuing Education*	N/A proto-STARS
PAE Credit 22	Community Service Participation	6
PAE Credit 23	Community Service Hours	6
PAE Credit 24	Sustainability Policy Advocacy	4
PAE Credit 25	Trademark Licensing * (yes proto-STARS)	4
Tier Two	*Public Engagement Tier Two Credits (2-3 is N/A for proto-STARS)*	0.5
Total		88.75

Appendix B – Interview Tool

I. Background Information

To begin, I would like to get a bit of background information on your role on your campus as well as the proto-STARS program.

1. Please describe your position at your campus as it relates to the campus sustainability program.
  - ☐ Sustainability Coordinator/Director/Manager
  - ☐ Staff member who reports to Sustainability Coordinator/Director/Manager
  - ☐ Member of Sustainability Committee/Working Group
  - ☐ Provost or Dean who oversees campus sustainability initiatives
  - ☐ Other, please list position: _____

2. How long have you held this position on your campus?

3. Are you the first person to hold this position? If not, how many others have held your position?

4. In addition to coordinating the STARS program, what are your primary responsibilities regarding campus sustainability?

   Is your work in sustainability recognized in your employment structure (ie % FTE)? If so, what % FTE? _____% (or explain if other structure)

5. Please describe the timing of STARS within your school's sustainability program? For example, STARS was one of the first programs the sustainability program engaged in. Or, STARS took place after several years of sustainability related programs at my campus?

6. As of this date, what is your schools' STARS rating level?
  - ☐ STARS Bronze
  - ☐ STARS Silver
  - ☐ STARS Gold
  - ☐ STARS Platinum

II. Goals & Perceived Effects

In this section, I would like to learn about your impressions of the goals of the STARS program and the effects of the proto-STARS pilot program on your campus.

Questions 7,8 & 9 refer to the STARS program as it was designed for colleges. Please answer from your perspective of the program. You do not need research the specifics of the program.

Questions 10 - 13 refer the nine schools proto-STARS program and, specifically, proto-STARS on your campus.

7. From your understanding of the STARS program, what would you list as the general goals of the program?

8. From your understanding of the STARS program, who, or what, would you describe as the primary beneficiary of the program?

9. What was the primary way that you developed your understanding of the STARS program's goals?

      ☐ Talking with other proto-STARS participants about STARS
      ☐ The STARS website
      ☐ The STARS technical manual
      ☐ Other; please describe: _____

10. What was your primary goal in participating in the proto-STARS program?

11. What were your other goals for participation?

12. How well were your goals met by participating?

      ☐ Fully met
      ☐ Mostly met
      ☐ Partially met
      ☐ Not at all met
      ☐ Not sure yet

13. If you answered "Partially met" or "Not at all met," please explain why you do not think the program met your goals?

III. Implementation

In this section, I am interested to learn about your understanding of how STARS was actually implemented on your campus.

Question 14 refers to the STARS program as it was designed for colleges. Please answer from your perspective of the program. You do not need to research the specifics of the program to answer the question.

Questions 15-24 refer the nine schools proto-STARS program and, specifically, proto-STARS on your campus.

14. From your understanding of the STARS program, please describe how the program is supposed to be implemented on campuses. Including thoughts on steps of the program, who's involved, etc...

15. As you may know, STARS requires submission of a campus' rating within one year of registration, since proto-STARS is a pilot program the timeline is much more flexible. However, it has been approximately 12 months since the nine schools agreed to participate in the pilot program, do you feel like the one year timeframe is reasonable to complete the assessment? If no, please explain why.

16. Approximately how many hours would you say you spent collecting and synthesizing the data for the assessment?

    _____ hrs.

17. Approximately, how many people on your campus assisted with data collection/report synthesis for the proto-STARS report?

    _____ people

18. Please describe the one primary way proto-STARS data were collected at your campus.

    ☐ An individual collected proto-STARS data from various offices on campus
    ☐ A committee worked together to collect proto-STARS data
    ☐ A student group or class collected proto-STARS data
    ☐ Other, please explain: _____

19. In your assessment, what year did you use for the "performance year" (e.g. FY 10, academic year, other)?

20. Were you able to establish a 2005 baseline where necessary (emissions comparison, etc.)? If not, did you use a replacement year or leave those credits blank?

21. Please describe the section of the proto-STARS report that was the most challenging to complete (e.g. education, greenhouse gas calculator, investment, etc...). Why was this particular section a challenge?

22. Has your campus participated in a comprehensive sustainability assessment other than proto-STARS? If so, what was the format (consultant, internal, other) and when did the assessment take place?

    If yes, was information from the former assessment useful in completing the proto-STARS tool?

◻ Yes
◻ No
◻ Somewhat, explain_____

If so/if not, why? _____

23. Have you attended Sustainability Group meetings and/or participated in conference calls of the nine schools regarding proto-STARS?

◻ Yes
◻ No
If so, how many? _____ (all, none, one, etc.)

24. What one part of the proto-STARS program did you find most useful and why?

◻ Communication with various campus departments during data collection
◻ Collecting data into a common document
◻ Learning about what areas of your campus have "room for improvement"
◻ Having a rating attached to your school's current programming
◻ Communicating with other schools in the pilot program
◻ Other, list: _____

Why was this component most useful?

25. Have you or do you plan to share the results of the proto-STARS tool with your institution's community at large? If so, which group(s) is/are your primary audience?

◻ Classes
◻ Sustainability Committee
◻ Senior Administration
◻ Trustees
◻ Alumni
◻ Other schools
◻ Public/Prospective Students
◻ Other, list: _____

IV. Concluding Thoughts

In this section, I am interested in any additional thoughts you have about the proto-STARS program.

26. What were the primary benefits to your institution's participation in the proto-STARS program?

27. What were the primary challenges for your institution's participation in the proto-STARS program?

28. From your perspective, has anything changed on your campus regarding the sustainability program/initiatives as a result of participating in the pilot program? If so, please describe.

Appendix C – Interview Results

I. Background Information

1. Please describe your position at your campus as it relates to the campus sustainability program.

	Response Count
Sustainability Coordinator/Director/Manager	8
Staff member who reports to Sustainability Coordinator/Director/Manager	0
Member of Sustainability Committee/Working Group	0
Provost or Dean who oversees campus sustainability initiatives	1
Other, please list position:	0

2. How long have you held this position on your campus?

	Response Count
1-2 years	2
3-4 years	5
5 + years	2

3. Are you the first person to hold this position? If not, how many others have held your position?

	Response Count
First	5
Second	4

4. In addition to coordinating the STARS program, what are your primary responsibilities regarding campus sustainability?

	Manage Sustainability Programming	Chair Committee	Advise Student Group	Liaison Between Departments	Strategic Planning	Other	% FTE/ Staffing Structure
A	X	X	X	X			.5
B	X			X			~.25
C	X	X	X			X	~.25
D	X	X	X	X			.5 (split between 2 people)
E	X	X	X	X	X		1.0
F	X			X	X	X	1.0
G	X	X	X	X	X		1.0
H	X	X	X				~.25
I	X		X	X		X	1.0

5. Please describe the timing of STARS within your school's sustainability program? For example, STARS was one of the first programs the sustainability program engaged in. Or, STARS took place after several years of sustainability related programs at my campus?

	Response Count
One of the first initiatives	2
Took place after several years of programming	7

6. As of this date, what is your schools' STARS rating level?

	Response Count
STARS Bronze	2
STARS Silver	2
Partially Complete	4
Not Started	1

II. Goals & Perceived Effects

7. From your understanding of the STARS program, what would you list as the general goals of the program?

- Metric tool that helps schools measure how well they fit the "ideal" sustainability

- Metric system for rating sustainability; provides a common language for schools to compare "apples to apples"

- A comprehensive way to quantitatively measure sustainability level

- Provides an ambitious framework for schools to think about new policies/programming related to sustainability

- Schools measure lots of different areas of campus operations; STARS is a way to measure and compare sustainability across institutions

- Provides a whole-systems approach for benchmarking sustainability on a campus

- Template to pursue sustainability efforts across all components of a campus

- Provides a common metric tool for schools to examine their program and identify ways to become more sustainable; allows users to compare sustainability programs between schools

- Provides institutions with an objective way to benchmark sustainability performance

8. From your understanding of the STARS program, who, or what, would you describe as the primary beneficiary of the program?

	Response Count
The school in general	5
The administration	2
The nine Schools Sustainability Group	1
The public good	1

9. What was the primary way that you developed your understanding of the STARS program's goals?

	Response Count
Talking with other proto-STARS participants about STARS	4
The STARS website	0
The STARS technical manual	4
Other	0

10. What was your primary goal in participating in the proto-STARS program?

- Offered a way to measure progress and determine next steps

- Wanted to know where school stood in terms of sustainability; needed information to back up need for future programming

- Use a tool that "measures" sustainability commitment

- Use the tool to set an initial benchmark for the campus in terms of its current practices as they relate to sustainability

- Established a baseline to inform the development of an Environmental Master Plan

- Collaborate with the Sustainability Group on a common initiative

- Provided a way to track data related to campus sustainability within a pre-existing framework

- To learn about the school's program in a new way: identify strengths and weaknesses, celebrate strengths, strengthen weak areas and work with peer schools

- Established an initial benchmark for the school's state of sustainability

11. What were your other goals for participation?

- STARS provides definitions that would be difficult to develop on our own. We've spent decades defining what it means to be a "safe school." STARS gets us started considering what is a "sustainable school."

- Completing STARS with eight other schools gave the tool much more weight. It means more than if one school used it alone.

- STARS provides suggestions for what to do next in terms of sustainability.

- STARS give us the ability to compare sustainability programs across peer campuses.

- STARS allows us to: learn from other schools' experiences, open lines of communication between departments about the criteria for credits, and identifies routes through which we could more fully embrace and demonstrate our commitment to sustainability in the school program.

12. How well were your goals met by participating?

	Response Count
Fully met	3
Mostly met	2
Partially met	2
Not at all met	0
Not sure yet	2

If you answered "Partially met" or "Not at all met," please explain why you do not think the program met your goals?

- Unsure what impact will be when all nine schools compare full results

- Would feel better if there were an institutional commitment to update the tool yearly

III. Implementation

13. **From your understanding of the STARS program, please describe how the program is supposed to be implemented on campuses. Including thoughts on steps of the program, who's involved, etc...**

- School's sustainability committee works to get buy-in from the administration; involve a variety of people to complete the assessment

- Familiarize yourself with the credit criteria; get started by focusing on one section only; make a plan for who you'll need to speak with to get accurate information

- Involve as much of the community as possible; get buy-in from sustainability committee; decide on best approach for collecting and synthesizing data

- Form a working committee that is tasked with data collection; important to get buy-in for the time it will take to complete the assessment

- Process must be collaborative, and include communication with all departments; the school administration must be fully briefed, and aware of all criteria and outcomes; non-biased parties must review results (in our case, this has involved gatherings of the coordinators of our peer schools, in which we have reviewed results together)

- Having a point person is crucial to moving the project forward (ideal if this person has the authority to delegate); schools need to determine how they want collect information and explain rationale for each credit

14. **As you may know, STARS requires submission of a campus' rating within one year of registration, since proto-STARS is a pilot program the timeline is much more flexible. However, it has been approximately 12 months since the nine schools agreed to participate in the pilot program, do you feel like the one year timeframe is reasonable to complete the assessment? If no, please explain why.**

	Response Count
Yes	4
No	1

- No: Not without a full-time, experienced sustainability coordinator who has been at the school for a while. It takes lots of work and lots of delegation, and that delegation takes time and oversight. With a part-time coordinator, it takes significantly more time.

15. Approximately how many hours would you say you spent collecting and synthesizing the data for the assessment?

	Response Count
60 – 80 hrs	3
81 – 100 hrs	1
Not sure, collected over a period of months	4

16. Approximately, how many people on your campus assisted with data collection/report synthesis for the proto-STARS report?

	Response Count
1-3	3
4-7	3
7 or more	2

17. Please describe the one primary way proto-STARS data were collected at your campus.

	Response Count
An individual collected proto-STARS data from various offices on campus	4
A committee worked together to collect proto-STARS data	1
A student group or class collected proto-STARS data	0
Other: 2-3 People Worked Closely	2

18. In your assessment, what year did you use for the "performance year" (e.g. FY 10, academic year, other)?

	Response Count
FY 10	4
Mix of FY10 & FY09	1
Mix of FY 08 & FY 09	1
No Sure	2

19. Were you able to establish a 2005 baseline where necessary (emissions comparison, etc.)? If not, did you use a replacement year or leave those credits blank?

	Response Count
Yes	5
No	2

20. Please describe the section of the proto-STARS report that was the most challenging to complete (e.g. education, greenhouse gas calculator, investment, etc...). Why was this particular section a challenge?

	Section (response count)
Education	Defining sustainability in the curriculum (2)
Operations	Dining: Food Purchasing (1) Waste (1) Transportation (1)
Planning and Administration	Investment (1)
	Note sure yet (2)

21. Has your campus participated in a comprehensive sustainability assessment other than proto-STARS? If so, what was the format (consultant, internal, other) and when did the assessment take place?

	Response Count
Yes (Consultant) A, E	2
Yes (Internal, faculty/staff) N	1
Yes (Internal, student) C	1
No B, D, L, S	4

If yes, was information from the former assessment useful in completing the proto-STARS tool?

	Reason
Yes	Jump-started systems to start tracking data; helped provide data for proto-STARS Provided a 2005 baseline, and opened lines of communication, gave our Task Force a basic understanding of the inner workings of the school, which allowed us to communicate in a more informed way.
Somewhat	Provided some useful information on utility consumption

22. Have you attended Sustainability Group meetings and/or participated in conference calls of the nine schools regarding proto-STARS?

	Response Count
Yes	8
No	1

23. What one part of the proto-STARS program did you find most useful and why?

	Response Count
Communication with various campus departments during data collection B, E, S	3
Collecting data into a common document C, N	2
Learning about what areas of your campus have "room for improvement"	0
Having a rating attached to your school's current programming	0
Communicating with other schools in the pilot program A	1
Other	0

24. Have you or do you plan to share the results of the proto-STARS tool with your institution's community at large? If so, which group(s) is/are your primary audience?

(able to select more than one audience)	Response Count
Classes/Students	2
Sustainability Committee	3
Senior Administration	2
Trustees	2
Alumni	0
Other schools	0
Public/Prospective Students	3

IV. Concluding Thoughts

25. What were the primary benefits to your institution's participation in the proto-STARS program?

- Doing proto-STARS as a group was highly motivating.

- An example of collaborative learning.

- Opened lines of communication across departments.

- Ability to talk to other schools and compare notes along the way.

- Communication, both within the school and between the 9 schools.

- Provides a common language to talk about sustainability within each school and across campuses.

- Provides a baseline for moving forward.

- Provides a framework to set goals and think about what needs to be done in the future instead of always focusing on what's been done in the past.

- The tool is based on self-reporting, unlike LEED which emphasizes third-party verification.

- Laid groundwork for a planning for the future.

- A useful goal-setting tool for the Sustainability Task Force.

26. What were the primary challenges for your institution's participation in the proto-STARS program?

- It took awhile to figure out what data are needed.

- Time was the biggest challenge, not money.

- Allocating time to collect and review data are the most difficult part of the program.

- Different understanding of credit across campuses.

- Figuring out how to fact-check information gathered by various members of committee and what is the best way to analyze it.

- The reality that we are at 30% in all three categories might raise concerns if we had to make our rating public, like colleges and universities.

- Figuring out how to communicate the assessment with the campus community- especially among students and staff.

27. From your perspective, has anything changed on your campus regarding the sustainability program/initiatives as a result of participating in the pilot program? If so, please describe.

- Yes: allowed for deliberate education with staff and new members of the community; building upon past effort to "measure" sustainability- much better record keeping, increased conversations around sustainability

- Yes: curriculum review b/c of STARS; initiated development of green building policies; helped refine peer-to-peer education program (prefects becoming truly integrated in sustainability education)

- Yes: it seems as though decision makers are more attuned to the recommendations of the Task Force, because of the expertise behind the assessment tool, and the understanding that the initiatives recommended therein are on the radar of colleges and universities.

- Somewhat: completion of the assessment has opened up discourse of sustainability in more ways than past initiatives

- Not yet: possibility for change once the head meet to discuss STARS and conversations happen around the future of the program

Bibliography

American College and University Presidents' Climate Change Commitment (ACUPCC). (2011). *Signatory List*. Retrieved from http://www.presidentsclimatecommitment.org/signatories/list

Association for the Advancement of Sustainability in Higher Education (AASHE). (2009). *Sustainability Tracking Assessment and Rating System (STARS) for Colleges and Universities: Pilot Project Results*. Retrieved from https://stars.aashe.org/pages/about/history/historic-documents.html

Association for the Advancement of Sustainability in Higher Education (AASHE). (2009a, November). Webinar: How to Make the Most of AASHE Resources. Retrieved from www.aashe.org/webinars/making.most.of.AASHE.resources_11.5.09

Association for the Advancement of Sustainability in Higher Education (AASHE). (2011, November). *Sustainability Tracking Assessment and Rating System (STARS): Version 1.0 Technical Manual, Administrative Update, November 2010*. Retrieved from https://stars.aashe.org/pages/about/history/stars-10.html

Association for the Advancement of Sustainability in Higher Education (AASHE). (2011, March 24). *STARS Dashboard [Graphs]*. Retrieved from https://stars.aashe.org/institutions/data-displays/dashboard/

Association of University Leaders for a Sustainable Future (ULSF). (2010)**.** *Talloires Declaration Institutional Signatory List*. Retrieved from http://www.ulsf.org/programs_talloires_signatories.html

Bardaglio, P. & Putman, A. (2009). *Boldly Sustainable: Hope and Opportunity for Higher Education in the Age of Climate Change.* Washington, D.C.: NACUBO.

Bardati, D. (2006). The Integrative Role of the Campus Environmental Audit: Experiences at Bishop's University, Canada. *International Journal of Sustainability in Higher Education*, 7(1), 57-68. doi: 10.1108/14676370610639245

Bartlett, P. & Chase, G. (Eds.). (2004). Sustainability on Campus: Stories and Strategies for Change. Cambridge, MA: MIT Press.

Beringer, A., & Adoment, M. (2008). Sustainable University Research and Development: Inspecting Sustainability in Higher Education Research. *Environmental Education Research*, 14(6), 607–623.

Carlson, S. (April 17, 2009). Campus Officials Seek Building Efficiencies, One Square Foot at a Time. *The Chronicle of Higher Education*. Retrieved from http://chronicle.com/article/Campus-Officials-Seek-Building/3292

Carlson, S. (July 20, 2010). Colleges Say They Expect Their Green Raters to Measure Up. *The Chronicle of Higher Education*. Retrieved from http://chronicle.com/article/Colleges-Say-They-Expect-Their/123617/

Carlson, S. (October 27, 2010). Amid Continuing Controversy, a New Green Report Card Rates Colleges Again. *The Chronicle of Higher Education.* Retrieved from http://chronicle.com/blogs/buildings/amid-continuing-controversy-new-green-report-card-rates-colleges-again/27791

Clarkson, P. M., Yue, L., Richardson, G.D. & Vasvari, F. P. (2008). Revisiting the Relation between Environmental Performance and Environmental Disclosure: An Empirical Analysis. *Accounting, Organizations and Society*, 33(4–5), 303–327. doi:10.1016/j.aos.2007.05.003

Creighton, S. H. (1998). *Greening the Ivory Tower: Improving the Environmental Track Record of Universities, Colleges and Other Institutions*. Cambridge, MA: MIT Press.

Dautremont-Smith, J. & Barros, F. (2010, October). Sustainability Rating for Schools: Which Way Forward [Presentation Slides]. Presented at the Green Schools National Conference, Minneapolis, MN.

Dingwerth, K. & Eichinger, M. (2010). Tamed Transparency: How Information Disclosure under the Global Reporting Initiative Fails to Empower. *Global Environmental Politics*, 10(3), 74-96. Retrieved from http://muse.jhu.edu/journals/gep/summary/v010/10.3.dingwerth.html

Dye, R. (1985). Disclosure of Nonproprietary Information. *Journal of Accounting Research*, 23(1), 123-145. Retrieved from http://jstor.org

Edwards, A. (Ed.). (2005). *The Sustainability Revolution: Portrait of a Paradigm Shift*. Grabriola, B.C.: New Society Publishers.

Fonseca, A., Macdonald, A., Dandy, E. & Valenti, P. (2011). The State of Sustainability Reporting at Canadian Universities. *International Journal of Sustainability in Higher Education*, 12(1), 22-40. doi: 10.1108/14676371111098285

Global Reporting Initiative (GRI). (nd). *History*. Retrieved from http://www.globalreporting.org/AboutGRI/WhatIsGRI/History/

Herschovis, M. S., Herremans, I., & Warsame, H. (2009). *The Role of Internal Processes in the Sustainability Performance and Disclosure Relationship*. CAAA Annual Conference 2009 Paper. Retrieved from http://ssrn.com/abstract=1326088

Higher Education Associations Sustainability Consortium. (2006). *Call for a System for Assessing & Comparing Progress in Campus Sustainability*. Retrieved from www.aashe.org/files/documents/STARS/HEASCcall.pdf

Hignite, K. (2006, April). Will Sustainability Take Root? *Business Officer*, 12-22. Retrieved from http://www.aashe.org/documents/resources/pdf/Bus.Off.Sust.5.06.pdf

Jacobs, F. & Kapuscik, J. (2000). Making It Count: Evaluating Family Preservation Services. Medford, MA: Tufts University.

Klein, U. (February 4, 2011). A Blueprint for Advancing Education for Sustainability: Leading National EfS Organizations Map Out Opportunities for Collaboration [press release]. *Second Nature*. Retrieved from http://www.secondnature.org/news/efs.html

Merriam, S. B. (2009). *Qualitative Research: A Guide to Design and Implementation*. San Francisco, CA: Jossey-Bass.

Merkel, J. & Litten, L. (2007). The Sustainability Challenge. *New Directions for Institutional Research,* 134, 7-26.

Patten, D. (2002). The Relation between Environmental Performance and Environmental Disclosure: A Research Note. *Accounting, Organizations and Society*, 27, 763-773. Retrieved from www.elsevier.com/locate/aos

Rappaport, A. & Creighton, S. H. (2007). *Degrees That Matter: Climate Change and the University*. Cambridge, MA: MIT Press.

Retzlaff, R. C. (2008). Green Building Assessment Systems: A Framework and Comparison for Planners. *Journal of the American Planning Association*, 74(4), 505-519. doi: 10.1080/01944360802380290

Shepard, J. & Johnson, L. (2009). Implementing Sustainable Institutional Practices. *The Journal of Education for Sustainable Development*, 3(2), 217-220. doi: 10.1177/097340820900300220

Shriberg, M. (2002). Institutional Assessment Tools for Sustainability in Higher Education: Strengths, Weaknesses and Implications for Practice and Theory. *International Journal of Sustainability in Higher Education*, 3(3), 254-270. doi: 10.1108/14676370210434714

Shriberg, M. (2003). Is the "maize-and-blue" turning green? Sustainability at the University of Michigan. *International Journal of Sustainability in Higher Education*, 4(3), 263-276. doi: 10.1108/14676370310485465

Shriberg, M. (2004). Assessing Sustainability: Criteria, Tools, and Implications. In P.B. Cororan & A. E. J. Wals (Eds.), *Higher Education and the Challenge of Sustainability: Problematics, Promise and Practice* (pp. 71 – 86). Netherlands: Kluwer Academic Publishers.

Thompson, G. & Creighton, S. H. (2007). Metrics and Meaning for Environmental Sustainability. *New Directions for Institutional Research*, 134, 41-54.

Weiss, C. H. (1998). Evaluation: Methods for Studying Programs and Policies (second edition). Upper Saddle River, NJ: Prentice-Hall Inc.