

Tracking the Sustainable Development of WAC Programs Using Sustainability Indicators: Limitations and Possibilities¹

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Abstract: *Sustainable WAC: A Whole Systems Approach to Launching and Developing Writing Across the Curriculum Programs* (Cox, Galin, & Melzer, 2018a) lays out a systematic whole systems approach to program development that draws on complexity theories and integrates the use of sustainability indicators (SIs) for monitoring and assessing program sustainability. However, the SI part of the whole systems approach methodology may be overly burdensome and even premature for assessing the sustainability of smaller and younger WAC programs. Further, aspects of the SI methodology need clarification to be useful to the larger WAC programs that would benefit from its use. This article provides important correctives to and elaborations of the treatment of SIs in *Sustainable WAC* that will help WAC program directors more effectively decide whether and how to use this tool as part of a whole systems approach to develop more sustainable and impactful WAC programs.

In response to a need for a more theorized and systematic approach to developing WAC programs that are both transformational and sustainable, we, along with our co-author, Dan Melzer, drew from complexity theories to create the whole systems approach (WSA) to WAC program development. Our book, *Sustainable WAC: A Whole Systems Approach to Launching and Developing Writing Across the Curriculum Programs* (2018), emphasizes a slow, deliberate, and strategic approach to program development that includes coming to a deep understanding of campus culture and context, the use of mission and goals to guide development, the inclusion of stakeholders in determining program mission and activities, and ongoing assessment of program sustainability through the use of sustainability indicators (SIs). *Sustainable WAC* lays out a methodology that includes four stages: Understand, Plan, Develop and Lead (see Figure 1).

Each stage draws from ten principles (pp. 46-47) we derived from the theories and includes associated strategies and tactics. We integrated the development and tracking of SIs across all four stages, a strategy we adapted from sustainable development theory to define, assess, and ultimately monitor program sustainability (Bell & Morse, 2008; Bossel, 1999; Hardi & Zdan, 1997). During the Understand stage, the director, while coming to a deeper understanding of campus context and mood, identifies “baseline” SIs, which we are here reconceptualizing as “proto-SIs.” During the Plan stage, the director gathers a group of stakeholders to form a WAC committee and then works with this group to consider how to best position WAC for connectivity within the campus network, develop the program’s mission and goals, develop program SIs, determine the slate of projects that

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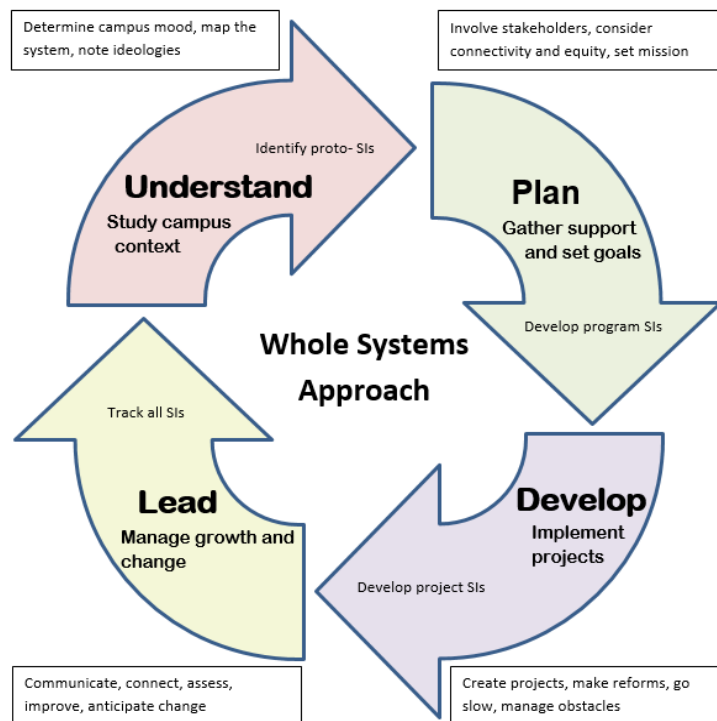
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would fulfill the mission and goals, and consider how these projects would impact different groups on campus, particularly marginalized and disenfranchised groups. During the Develop stage, the director, along with stakeholders, generates project SIs and launches these projects (i.e. writing fellows program, writing-intensive curriculum, faculty development workshop series), while moving slowly and managing challenges and obstacles to program development. During the Lead stage, the director, along with stakeholders, seeks to manage growth and change within the WAC program while creating visibility for the program, connecting with systems outside of the university, and gathering SI data from across the program to keep an eye on program viability and make any necessary adjustments. We assert in the book that operationalizing SIs is a necessary part of the WSA. Here we want to soften that position a bit.

Figure 1: The Whole Systems Approach to WAC Program Development



From Cox, Galin, and Melzer, 2018b, p. 76.

Since the publication of *Sustainable WAC*, we have come to realize that the SI strategy is the element of our framework that creates the most stumbling blocks for WAC program directors in taking up the whole systems approach. We have received questions related to how to identify SIs, how to operationalize them, and even the extent to which this strategy is relevant, particularly for smaller and younger WAC programs for which the impediments to sustainability may be obvious. Indeed, the use of SIs originated to address far more complex problems than those faced by WAC programs. Outside of writing programs, SIs are used to bring together data points across human, economic, and social systems in order to guide decisions about sustainable development at different scales,

including the sustainable development of businesses, towns, regions, and even human society at large (Hardi & Zdan, 1997). A method developed to address such complicated world problems as economic development in relation to limited natural resources and equity may seem less useful to WAC programs. These concerns, as well as our own experiences with SIs as program directors, have helped us better understand the limitations of SIs to the whole systems approach, but also provide clarity on when and how they may be valuable.

Over the past year, we have developed important correctives to and elaborations of SI treatment as well as clearer approaches to their operationalization. The goal of this article is to present these insights so that WAC program directors may better determine whether using SIs would be worth the effort, and if so, how to more effectively use SIs as part of a whole systems approach to developing WAC programs. We first provide background on SIs in relation to sustainable development theory and WAC program development and then clarify the following aspects of the use of SIs: the identification of “proto-SIs” during the Understand stage, the process of working with a group of stakeholders to identify and assess SIs, and the use of the Drive-Pressure-State-Impact-Response (DPSIR) heuristic, which we had formerly discussed for creating SIs but now see as a useful heuristic later in the process of WAC program development. Throughout the article, we draw on our own experiences using the WSA as program directors.

Sustainability Indicators: What are They and Why Use Them within a WAC Context?

One reason we value the SI method is its focus on stakeholder buy-in and methods for creating this buy-in. As described in a United Nations white paper, a sustainable development approach is one that “integrat[es] environmental, social, and economic concerns into all aspects of decision making” (Emas, 2015, p. 2). This coalescence of data across natural, social, and economic systems requires that stakeholders from these systems are included in the process of creating sustainability goals, defining indicators that would help monitor progress towards these goals, and assessing and redefining goals and indicators. As Simon Bell and Stephen Morse (2008) stress, the inclusion of stakeholders throughout the process is an effective approach to creating the buy-in needed to move toward sustainable development goals.

WAC directors have long understood the importance of stakeholder buy-in to WAC program sustainability. In the WAC scholarship, faculty and upper-level administrators are highlighted as the most important stakeholder groups. As pointed out by Martha Townsend (2008), “if either faculty or administration is unwilling or disinterested, the WAC program will likely fail” (p. 51). Many of the approaches described in the WAC scholarship for increasing faculty and administrator buy-in are focused on actions the WAC director can take. In terms of faculty buy-in, the WAC scholarship discusses approaches to leading faculty workshops and conversations about writing pedagogy, engaging in collaborative research with faculty in the disciplines, forming faculty study groups, and working with university governance to recognize effective teaching within the reward system (Carson, 1994; Freisinger, 1982; Fulwiler, 2006; Soven, 1988; Strenski, 1988; Townsend, 2008; Walvoord, 1992). In terms of administrator buy-in, WAC scholarship suggests that the WAC director tie a WAC program’s mission to university mission, join university committees related to general education, and document program impact through effective assessment (Carson, 1994; Condon, 2001; Haswell & McLeod, 1997; McLeod, 1988; Townsend, 2008).

Less discussed are approaches to bring stakeholders into roles related to WAC program leadership, though examples do exist. In an early piece on starting a WAC program, Sue McLeod (1988) advises

WAC directors to create a WAC committee composed of “most powerful and influential people on campus.” She sees this group as both figureheads and advisors, saying that:

[The committee members] should be given a good deal of power and press but not much work, other than to dispense advice to the chair. The existence of the committee is symbolic, showing that the entire university supports the writing across the curriculum effort. ... But the most important function is to act in an advisory capacity; WAC directors need the seasoned opinions of some of the wisest people on campus as they move toward change. (p. 11)

Such a statement suggests that stakeholders are important for program development but that they should only act in limited roles.

In contrast, Barbara Walvoord (1992) advises that stakeholders are brought into the program as collaborators right from the start of the program as an initial planning committee. This committee, composed of faculty from across the disciplines as well as administrators, staff, students, and teaching assistants, work together to plan the initial faculty development workshops. Walvoord says that this group may later become an executive WAC committee who continues to plan WAC activities as the program grows. She comments that, “This committee model may be slower and more cumbersome than direct action by the initiator but has the advantage of enhancing faculty ownership and investment in the program” (p. 13). Others like Townsend (2001) and Condon (2001) have noted respectively that faculty groups have been instrumental in rolling out writing intensive programs, assessing WAC programs, and interpreting findings. These roles of stakeholder groups as figureheads, advisors, planners, assessors, and ultimately co-owners of the program in themselves promote program sustainability. The key difference is that within a whole systems approach, the stakeholders group focuses on program sustainability itself, integrating this focus across the development of the program and monitoring development through the use of SIs.

Another reason we value the use of SIs in WAC program development is that this method leads to clear articulation of features of sustainable WAC programs and a method for systematically assessing them. Though WAC scholarship has not used the term “sustainability indicators,” this concept is not as foreign as it may seem. Typically, scholars have focused on describing obstacles to WAC program longevity that they identify as “challenges” (Young & Fulwiler, 1990), “vulnerabilities,” and “features of success” (Townsend, 2008). For example, in their afterword to *Programs That Work*, Young and Fulwiler (1990) described six “enemies” of WAC as: (1) appointment of non-full time or non-tenure track WAC administrators with little or no WAC training ; (2) locating WAC programs in English departments with orthodoxies that may interfere with WAC goals; (3) the struggle to maintain WAC as a cross-disciplinary initiative within the siloed structure of a university; (4) the tenure system that values scholarship over teaching; (5) the university’s proclivity to increase class sizes that rely on testing rather than writing for assessment; and (6) embedded ways of thinking about writing among administrators, faculty, students, and the public that undermine the long-term institutional commitment needed to sustain a WAC program. Townsend (2008) names features of successful WAC programs, summarized by Cox, Galin, and Melzer (2018a) as “strong faculty support, strong administrative support, ongoing faculty development, low student-to-instructor caps in WI courses, a well-informed program leader, and regular program assessment” (p. 12). All of these challenges, vulnerabilities, and features of successful programs can be understood as signs of distress or success², which could easily be operationalized if they had been conceived within the theoretical framework of sustainability

indicators. SIs provide programs a systematic process and theoretical framework to identify tailored indicators and a practical framework to operationalize them.

We have recently come to recognize, however, the fact that there is now a process to establish SIs does not mean that every program will benefit from identifying and tracking them. Some programs are too small, too preliminary, or too underdeveloped to warrant formal SI tracking from the start. Michelle's program is a good case in point, despite it not being a WAC program. In 2014, Michelle launched a new writing and speaking support program for international multilingual graduate and professional students at Cornell University. She was charged with quickly hiring lecturers and launching a set of initiatives—courses, peer tutoring, workshops for students, and conversational English support—all within the first year of the program. During the first six years of the program, Michelle did not quantify SIs, but she did identify and work toward program characteristics that would indicate a better likelihood of sustainability: stable faculty positions, stable program space, adequate budget to meet its charges, strategic positioning within the university system, program visibility to key stakeholders, and the creation of an advisory board. Once this advisory board is established in spring 2020, Michelle will work with them to further define these characteristics as sustainability indicators and determine with them the usefulness of tracking them. As Michelle's program grows in complexity and becomes more integrated into the university, it will become even more important to track SIs, as this tracking will allow Michelle and program stakeholders to understand quickly program sustainability based on a growing number of intersecting factors.

When making the decision to develop SI tracking, the following benefits should be considered. The development and tracking of SIs:

- require the use of a participatory process that seeks to build consensus about sustainability goals
- compel this stakeholder group to articulate in concrete terms what sustainability means in relation to WAC
- bring together data points from multiple systems (rather than relying on one data point, such as program budget) to create a more nuanced understanding of a program or project's sustainability
- create clear data that may be communicated to stakeholders as evidence of a program's viability (or lack thereof)
- help WAC leaders notice threats to program and project sustainability and figure out steps for addressing them

Further, unlike most other forms of WAC program assessment, SI tracking is inward-facing, formative, focused primarily on improving and sustaining the program. Typically, WAC program assessments are outward-facing, summative, concerned primarily with proving that the program is successful. With an emphasis on improving rather than proving, SI tracking need only be concerned with the least number of indicators that are sufficient to track program viability over time. As we explain below, this data provides a clear picture of shifts in program viability, but it can also prove extremely useful to administrators who need to argue for additional resources when clear threats are revealed by radar charts, or what Bell & Morse describe as AMOEBA graphs in *Sustainability indicators: Measuring the immeasurable?* (2018). By emphasizing the inward-facing form of assessment, we are not arguing that outward-facing assessment be neglected. Rather, SI tracking should become one facet of a full program assessment package that is tailored to each specific WAC program within its institutional context.

We recommend establishing SIs as part of the WSA even if they are rudimentary at the start, as in the case of Michelle's program. Stakeholders will need to decide at the outset how much time and effort to devote to the process early on, how often to revisit SIs to ensure they are still predictive and informative, and how to implement them in the most efficient and effective manner.

To assist with this process, we describe below approaches for developing and using SIs within a whole systems approach to WAC program development. Rather than repeat information from *Sustainable WAC*, we focus on key aspects of the SI method that needed correction and clarification. In brief, in *Sustainable WAC*, we had stated that "baseline SIs" should be identified during the Understand stage. We now realize that it is more fruitful to develop SIs after the development of program mission and goals (during the Plan stage); however, signs of distress and success noticed during the Understand stage may be understood as "proto-SIs." Second, we realized that WAC directors would benefit from more explanation about leading stakeholders groups to develop SIs, a need that became clear from Jeff's experiences leading the FAU WAC committee in this process. Third, we had written about the Drive-Pressure-State-Impact-Response (DPSIR) framework as a heuristic when first developing SIs. We now realize that this framework is more useful for WAC program development later in the process, once SIs are developed and used to identify problems.

Noticing Proto-SIs during the Understand Stage

No matter the size of the institution or prospective WAC program, WAC administrators should act as ethnographers during the Understand stage, studying the campus mood as it relates to WAC, student writing, curricular change, and faculty development, mapping the system in order to locate hubs on campus and understand how power is distributed across campus, and uncovering ideologies related to student writing. During this stage, one might notice faculty attitudes to student writing, the visibility of student writing on campus, the number of students that delay taking writing or writing-intensive courses, and the percentage of writing-intensive courses taught by adjunct faculty and graduate teaching assistants. In *Sustainable WAC*, we discussed these aspects of writing culture noticed during the Understand stage as "baseline SIs," which could be used for planning interventions and assessing their impact.

We now realize it is not possible to name SIs during the Understand stage. Bell and Morse (2008) emphasize that SIs cannot be developed until two steps take place—a stakeholders group is established and this group collaboratively develops program mission and goals—steps that do not take place until the Plan stage. Both of these steps are crucial to SI development. The collaborative processes of working with a stakeholder group to develop and assess program goals lead to a program that, in comparison to a program led by a lone director, is better connected to networks across campus, is better informed by diverse perspectives, is more resilient, has more leverage, and is more likely to enact the kinds of transformative changes to a campus writing culture that WAC programs seek.³ Second, the stakeholder group should work collaboratively to develop the program mission, which "lays out the broad scope of what [they] hope to accomplish with the WAC program and clarifies its purpose" (Cox, Galin, & Melzer, 2018a, p. 131). The program goals are then developed to fulfill the mission, followed by the development of SIs, which "formulate the parameters within which the program should function" through articulation of bands of equilibrium (p. 131 and discussed later in this article). Projects are then designed to fulfill the goals, and SIs are used to track impact of the projects. Thus SIs cannot precede the formation of mission and goals. For these reasons, we propose the term "proto-SI" to characterize the features of the campus writing practices and culture observed during the Understand stage.

The information gathered in the Understand stage helps to determine the campus mood, including identification of distressing signs, as well as signs of success that can help ground a program. Both signs of distress and success can point to indicators that later become SIs for specific program goals. Jeff's experiences at FAU provide a helpful context for better articulating the process of working with a stakeholders group to develop and track SIs.

The Process for Developing and Tracking SIs with a Stakeholders Group at FAU

When starting a 10th-year review of the FAU WAC program in fall 2017, Jeff led the WAC committee in revisiting the program mission and goals. The original mission statement had been cobbled together by Jeff from other WAC programs. Revisiting the mission statement as part of program review opened discussions of the WAC committee's values and led to a statement that was co-owned and better reflected the FAU program. The committee reduced two paragraphs into one, eliminated jargon, emphasized support for faculty, focused on critical thinking for students, and emphasized both reading and writing rather than writing alone to arrive at the following mission statement:

The University's Writing Across the Curriculum (WAC) program supports faculty to strengthen teaching and learning writing across all levels and disciplines in undergraduate education. We collaborate with individual faculty and departments to instill in their students critical thinking and complex problem solving through the complementary processes of reading and writing.

Once the mission statement was finalized, the committee turned their attention to goals, something that had previously not been defined for the FAU WAC program. During this process, the committee developed five goals, one for each of the program's primary projects: faculty support, maintaining WAC courses, assessing outcomes, enriching departmental curriculum, and recognizing excellence. For example, goal one is as follows:

(1) Support the Teaching of Writing: Assist colleges, departments, and individual faculty members with specific strategies to support student writing (e.g. designing and sequencing of assignments, providing feedback on and evaluation of student work)

Once the goals were defined, Jeff facilitated a committee discussion to develop program SIs for each goal.

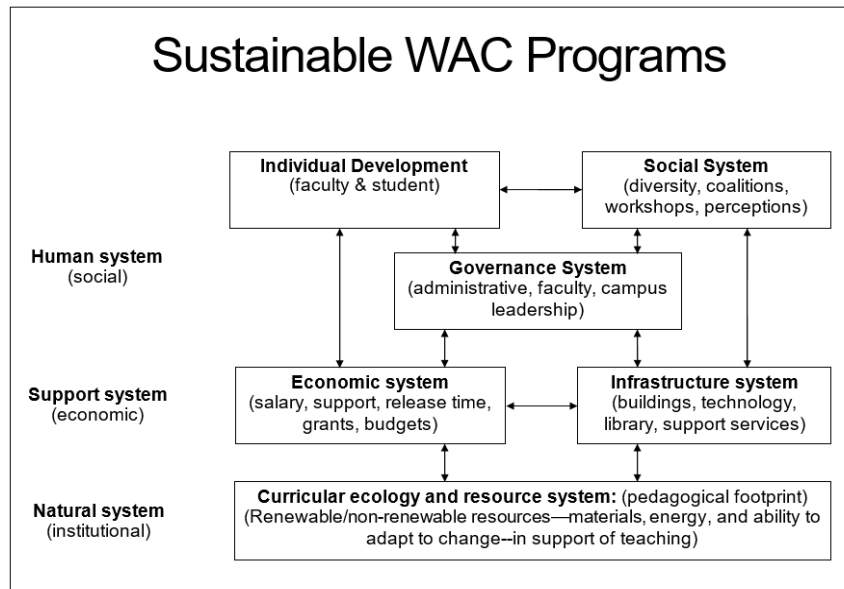
Developing SIs involves a straightforward process of four steps to ensure that all stakeholders have a chance to suggest ideas, all of which are taken into consideration, but ultimately narrowed to identify the least number of necessary but sufficient SIs (adapted from Bell & Morse, 2008, p. 174):

1. *List* all SIs that come to mind without censoring or critiquing but still focused on the goal of sustainability.
2. *Qualify* and narrow the list by determining if each SI is relevant, easy to understand, reliable, durable, and assessable, does not duplicate others and whether it reveals impacts as it offers historical patterns.
3. *Select* the 5-10 most feasible SIs by considering the resources needed to track them, relative importance, and greatest insight.

4. *Unpack* each SI to identify implementation procedures by determining if it can be quantified and setting the minimum and maximum thresholds (bands of equilibrium).

Using this method, Jeff found three tactics particularly effective in helping the FAU WAC committee identify the range of necessary SIs: 1) signs of distress and success, 2) the WAC anthrosphere framework, 3) and the discussion of a data set of mock SIs for a writing-intensive initiative.

Figure 2: The WAC Anthrosphere



Reprinted from Galin, Jeffrey R. (2010), "Improving Rather than Proving: Self-administered Sustainability Mapping of WAC Programs." Council of Writing Program Administrators Conference, Minneapolis, MN.

Identifying signs of distress and success proved a useful starting place, as they are so tangible. It is easy to note clear threats to WAC program sustainability such as the absence of university funding, lack of program visibility, insufficient faculty support, or an unmanaged WID requirement. It is also quite easy to identify program assets that lead to its success such as a high level of program integration throughout university practices like assessments, faculty recognition toward tenure, and course release time for the director. When the concept of SIs is introduced in this commonsense manner, the process is grounded from the start in daily practices.

The second tactic Jeff used was a heuristic that Hardi and Zdan (1997) introduced and that Bossel extended (1999, p. 18). This heuristic asks program developers to consider, as they develop SIs, the intersections among the human, economic, and natural systems, as well as the subsystems within them. Jeff had adapted this heuristic to develop the WAC anthrosphere framework, which introduces the social, economic, and institutional systems that intersect within the university's curricular ecology (see Figure 2 above).

Jeff found at his own institution that introducing the notions of distress and success within the context of the WAC anthrosphere leads to a systematic approach with a clear set of goals and outcomes that prevents overlooking less obvious indicators. Table 2 below includes all of the initial SIs that the FAU WAC committee developed for goal one, which focused on faculty support.

Table 2: Goal 1 - Faculty Support

System		Example SIs for WAC
Human system	Individual level	<ul style="list-style-type: none"> Effectiveness of reading and writing strategies and techniques provided in WAC training that faculty have implemented in their classes The degree to which WAC training has led faculty to change their courses Sufficiency of post-training faculty development
	Social system	<ul style="list-style-type: none"> Number of WAC courses trained faculty teach annually (instructors, DIS courses in Honors College) Distribution of WAC training across disciplines Distribution of WAC training across faculty status
	Governance system	
Support system	Economic system	<ul style="list-style-type: none"> Sufficiency of scheduling WAC training to support faculty needs Sufficiency of funding for faculty training
	Infrastructure system	
Natural system	Curricular ecology and resource system	<ul style="list-style-type: none"> Percentage of strategies and techniques supporting teaching reading and writing that faculty have used in non-WAC courses

Notice that there are only nine SIs for this goal and no governance or infrastructure SIs. Different goals will warrant different kinds of SIs. Notice also that about half of these SIs can be assessed by a simple annual faculty survey, and the rest can be assessed by gathering available data, making them feasible. After revisiting the SIs and operationalizing them, the WAC committee reduced the number of SIs from nine to four by culling indicators that would be hard to assess, were not truly indicative of sustainability, or just did not seem necessary:

1. Identify level of reading and writing strategies and techniques provided in WAC training that faculty have implemented in their WAC classes.
2. Identify level of reading and writing strategies and techniques provided in WAC training that faculty have implemented in their non-WAC classes.
3. Number of WAC sections trained faculty teach annually.
4. The number of departments actively teaching WAC classes.

Rather than assessing “effectiveness,” “sufficiency,” or “degree,” all of which are difficult to measure, there is a shift to identifying the strategies and techniques introduced in WAC training that were actually utilized in WAC and non-WAC courses and the numbers of sections and departments engaged in WAC work. The easier it is to gather the information, the less onerous the process

becomes. Furthermore, the fewer SIs used that are sufficiently predictive of longevity, the easier it is to manage the process.

The third tactic Jeff used that proved exceptionally helpful to work with the WAC committee was to introduce an SI data set from a mock WI program (see Table 3). Seeing the sample SIs, how bands of equilibrium are established, and the resulting radar charts (see Figures 3-7) helped the committee understand the goals and uses of SIs. Bands of equilibrium define the lower and outer limits of sustainability. Visualize a donut with an inner circle set to one as the lowest level of sustainable usage. Anything below one is not in a sustainable range. The outer circle, set to five, marks the upper limit of sustainability. FAU decided to set a level above five to clarify how upper limits can be unsustainable as well. Once the boundaries are set, the middle range becomes three. That makes two and four the above- and below-middle ranges. We demonstrate below how to operationalize the SI that tracks the number of available WI course sections to meet student need in the imagined WI program scenario.⁴

- **Level 0:** The range of course sections available below the minimum needed to ensure all students could reasonably expect to enroll in a given term? (Not sustainable)
- **Level 1:** The minimal number of course sections available in a given term so student progress towards their degrees is not impaired? (200) (inner band)
- **Level 5:** The maximum number of course sections needed for all students to register for necessary WI courses in a semester for which there are sufficient faculty to teach and classrooms available? (300) (outer band)
- **Level 6:** The number of course sections possible for all students to register for necessary WI courses in a semester but above which there are faculty available to teach? (Not sustainable)
- **Level 3:** The midpoint between levels 1 and 5 (250)
- **Level 2:** The midpoint between levels 1 and 3 (225)
- **Level 4:** The midpoint between levels 3 and 5 (325)

These numbers should not be set arbitrarily but should be discussed with the stakeholder group and informed by available data when possible. Once the bands of equilibrium are determined for all SIs for the program or a project, they can be brought together in a single spreadsheet to track data across SIs (see Table 3; see the Appendix for the process of creating radar charts using Microsoft Excel. We have also created an Excel template that anyone can use by replacing the indicators listed in the table below with indicators of their choice).⁵

One can see from the data set itself that there are changes happening within the program over time, but it would be difficult to create a narrative about these changes. The only clear difference in the numbers in Table 3 is that there are zeros in the final column for Fall 2016.

To unpack the narrative that the data are providing, it is necessary to create visual representations such as radar charts. These charts are recreated at regular intervals with updated data to provide visual snapshots of the program at particular points in time that together track shifts in project sustainability (for a fuller explanation, see Cox, Galin, & Melzer, 2018a, pp. 151-155).

Looking at the first two terms of data in the radar charts in Figures 3 and 4 below, we see a good start to the program in fall 2014 even though there are two SIs at the lower limit of sustainability. The capacity of the WAC committee to review WI syllabi suggests a couple more members needed to be named, and the director of the program needed some additional support to expand her capacity to manage.

In the second term, both of these concerns were addressed by increasing the number of faculty on the WAC committee and increasing support for the WAC director with release time or addition staff. Between spring 2015 and fall 2015, there is an interesting shift in faculty willingness to teach WI courses. Participation drops from a sustainable three to a nearly unsustainable one. This shift is coupled with a drop in faculty support services and capacity of student support services to handle demand, as well as another drop in the WAC committee's capacity to review WI syllabi (See Figures 5 and 6 below).

Table 3: Mock WI Initiative SI Data Set

	Fall 2014	Spring 2015	Fall 2015	Spring 2016	Fall 2016
Number of WI course sections available to meet student need	3	4	2	3	0
Faculty support services needed to grow WI capacity	3	3	2	1	0
Capacity of student support services to handle demand	3	3	2	3	3
Budget capacity to support WI (training, assessment, resources)	4	2	3	2	1
Capacity of WAC director to manage WI	1	4	4	4	4
Capacity of WAC committee to review WI syllabi	1	4	2	6	5
Availability of classroom space for WI courses	4	4	2	2	1
Number of faculty willing to teach WI to meet student enrollment	2	3	1	2	2
Class size for WI courses (number of students)	2	2	4	4	2
Equitable distribution of WAC courses across faculty levels	3	4	3	2	0

Note: the indented descriptors enable better presentation of the data in radar charts.

Figure 3: Radar Chart for Fall 2014 SI Snapshot

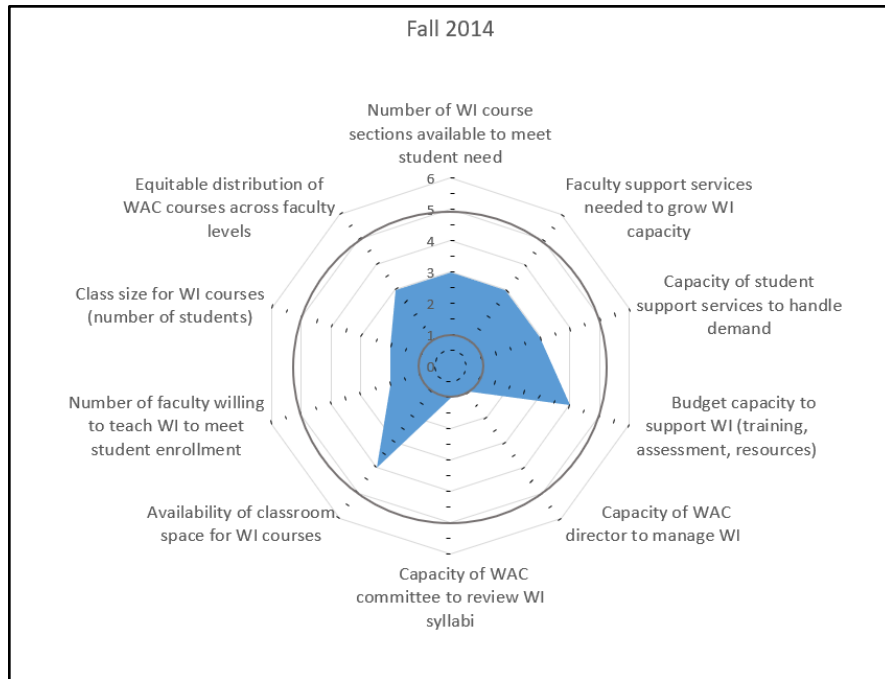


Figure 4: Radar Chart for Spring 2015

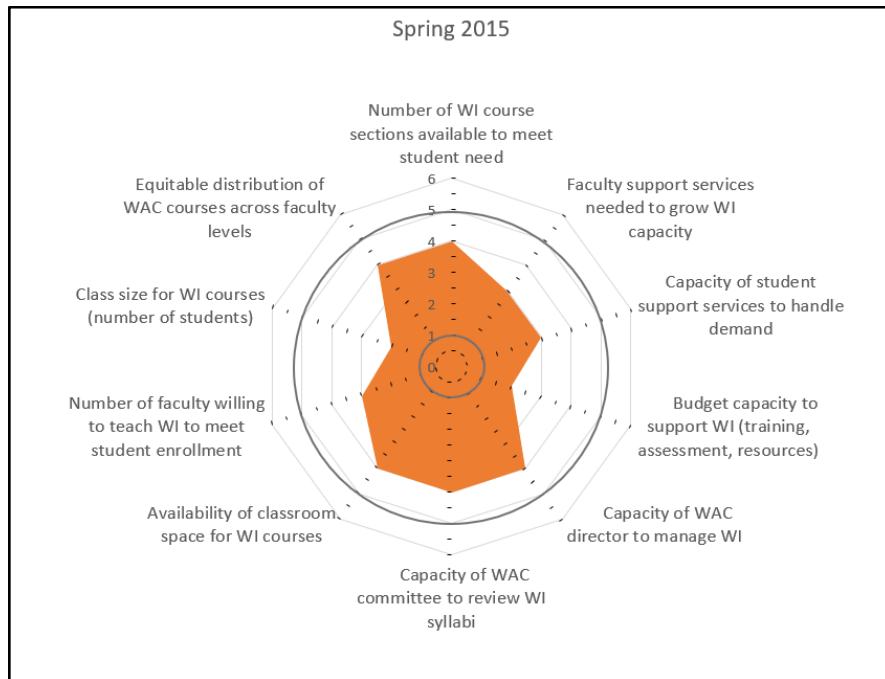


Figure 5: Radar Chart for Fall 2015

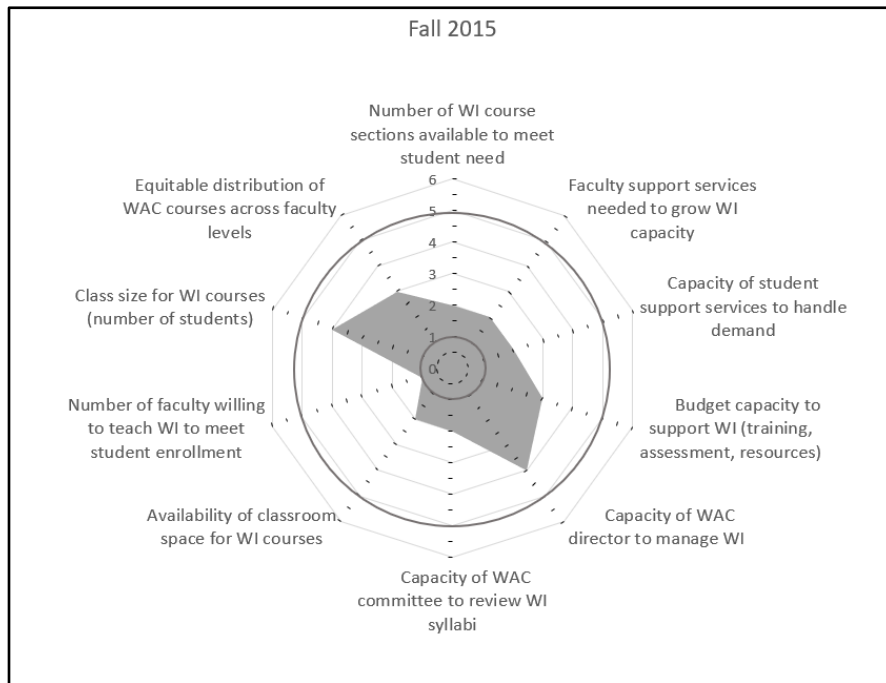
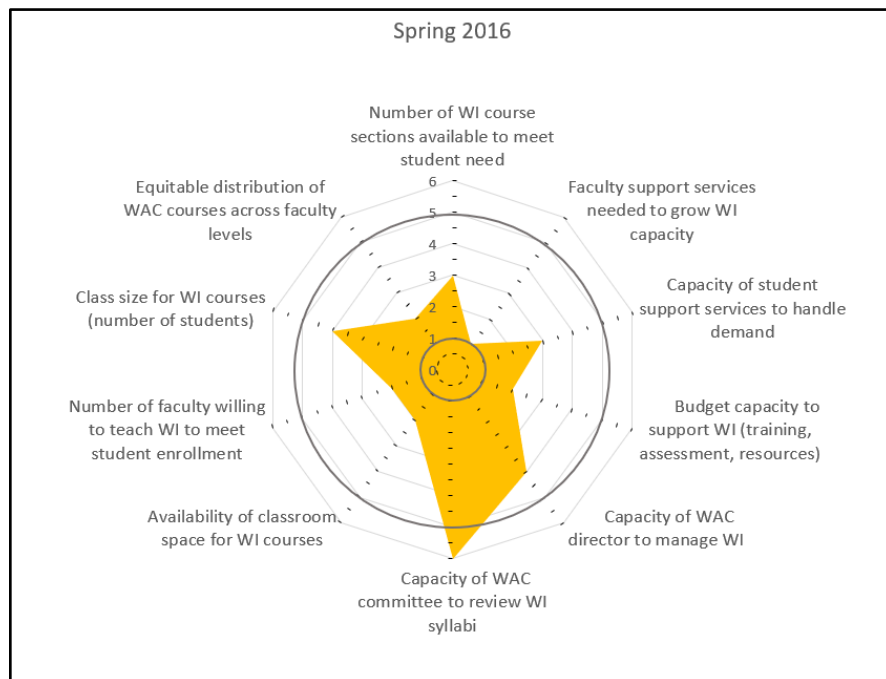


Figure 6: Radar Chart for Spring 2016



While we see some improvement in the willingness of faculty to teach the WI sections in these second two terms, faculty support services and budget capacity to support training continue to fall. We also begin to see a shift in the equitable distribution of WAC courses across faculty as more sections are introduced across campus and more adjuncts and graduate students are assigned WI courses rather than faculty. Perhaps the most important factor in both faculty willingness to teach and the shift in equity has to do with the increase in class size that was initiated in fall 2015.

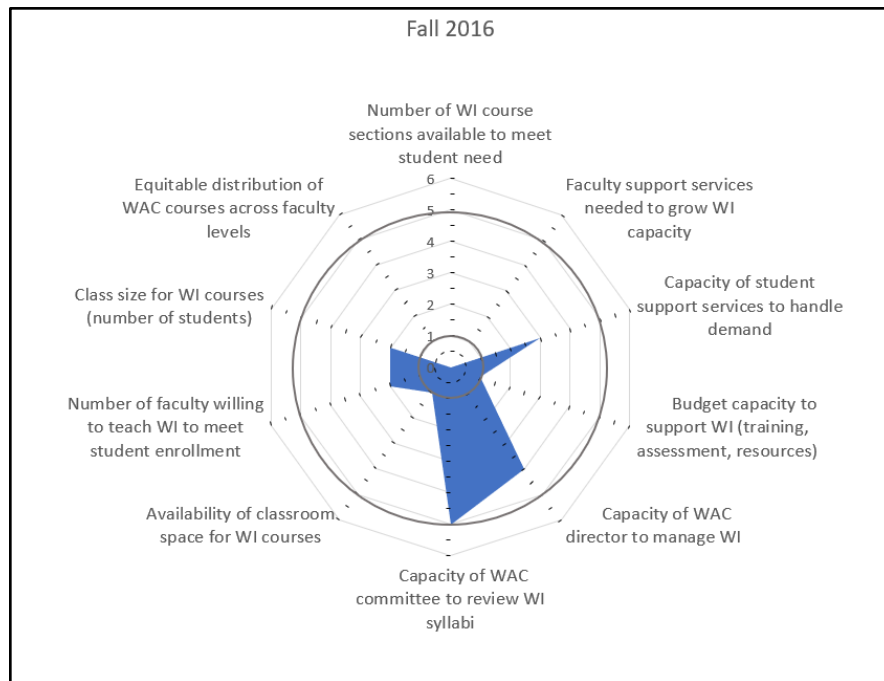
By the time fall 2016 rolls around, the number of faculty willing to teach WI sections has dwindled as faculty support continues to fall, number of sections continue to rise, availability of classrooms dwindles as the number of WI sections increase, and budget capacity to fund faculty stipends evaporates (see Figure 7 below). The combined impact means that there are not enough faculty to teach the necessary number of sections. This program is no longer sustainable.

Seeing this information from an imagined WI program enabled the FAU WAC committee to understand how to craft SI statements in such a way that would make them easy to operationalize. The WAC committee had originally posed SIs as questions, but changed them to statements when they started to define the band of equilibrium for each. For example, the first two questions for faculty support were originally written as:

- 1) How effective are strategies and techniques that support teaching reading and writing across disciplines?
- 2) Is WAC training distributed evenly across disciplines?

They were rewritten as:

- 1) Amount of reading and writing strategies and techniques provided in WAC training that faculty have implemented in their classes
- 2) Number of WAC courses trained faculty teach annually

Figure 7: Radar Chart for Fall 2016

Notice that the questions asked for qualitative responses, whereas the statements are quantitative. It is important to note that not all SIs will lead to percentages or numbers. For example, Goal 1 of FAU's SIs, "Support the Teaching of Writing," has a range of indicator types. Indicator 1 identifies a list of qualities that identifies the "level of reading and writing strategies and techniques provided in WAC training that faculty have implemented in their WAC classes." The first 4 levels are:

- 0. Not participating:** Not fulfilling any WAC criteria listed below
- 1. Below required minimum:** not providing one or two of
 - a) Revision (beyond editing and paragraph-level changes),
 - b) thesis-driven writing (evidence-based analysis and conclusions), or
 - c) provide formative written feedback on at least one thesis-driven paper.
- 2. Required minimum:**
 - a) Revision (beyond editing and paragraph-level changes),
 - b) thesis-driven writing (evidence-based analysis and conclusions), and
 - c) provide formative written feedback on at least one thesis-driven paper.
- 3. Above required minimum:** In addition to previous criteria,
 - a) assign a range of informal to formal writing assignments that engage students in the intellectual work of the class,
 - b) discuss strategies for improving student writing in class,
 - c) discuss organizational strategies, and
 - d) utilize a formal system for style and citation.

In this case, the WAC committee identified characteristics from the least amount of participation to the most. Individual elements in the list are not numerical, but the minimum level of acceptable inclusion is set to 1 and the maximum level of sustainable inclusion is set to 5. Any criteria above or

below these levels are not sustainable in most courses. Alternatively, “The number of departments actively teaching WAC classes” is a simple data point distributed across a scale of 0-6.

0. 0
1. 1-5
2. 6-10
3. 11-15
4. 16-20
5. 21 -25
6. 26 or more⁶

As a program changes or grows, these number distributions will need to shift as well. However, if the numbers are tracked over several years and, for example, the inclusion of WAC strategies and such practices in SI 1 as peer review, error tracking systems, assignment development strategies, and writing to learn exercises begins to drop, there is a clear rationale for intervention to reinvigorate faculty support. The importance of the information and ease of gathering this data increase the value of this indicator as they demonstrate the impact of faculty support on teaching.

The process of developing program mission, goals, and SIs can be facilitated within a reasonable time frame if managed strategically. FAU took nearly two years in part because the process had never been tried before and in part because we worked within our typical meeting structure of 2-3 meetings per term. Had we held a meeting for mission, one for goals, and then a retreat to develop an operationalize the SIs, we could have worked through the process in one term.

During this process of developing SIs with the committee, Jeff decided not to introduce the DPSIR framework as a heuristic because the WAC anthrosphere and mock data were sufficient strategies. It is also possible that adding yet another heuristic would be potentially overwhelming to the committee members. We wondered if this tactic from sustainable development theory should be excised from the whole systems approach, but further investigation revealed that it would be useful later in the WAC program development process, as we discuss next.

The DPSIR Framework as a Heuristic for Problem-Solving

The DPSIR framework was first developed by the Organisation for Economic Co-operation and Development (OECD, 1994) to assist in the decision-making process and to relate natural systems to human systems. This framework was later used to develop SIs, as organizations such as the Climate Policy Watcher (2017) realized that “from a policy point of view, there is a clear need for information and indicators for all parts of the DPSIR chain” (para. 8). Within a WAC context, we have found that the tactics Jeff describes above are more helpful to first develop SIs for WAC programs but that DPSIR is most useful for interpreting the results.

The five parts of the DPSIR framework are interrelated. *Driving forces* are changes in the social, economic and institutional systems (such as changes in how energy is generated) that trigger changes in the state of the environment. *Pressures* are the human factors triggered by the driving forces that impact the state of the environment. For example, changes in energy generation can lead to human actions like increased use of coal as an energy source, which in turn lead to changes in carbon dioxide levels and methane emissions. *State indicators* are observable changes in the environment, due to the pressures. For example, increases in carbon dioxide or methane in the atmosphere would lead to rising global temperatures. *Impacts* are changes in functions affecting social, economic, and environmental dimensions caused by the changes in state. For example, rising global temperatures would decrease agricultural production while increasing the number of

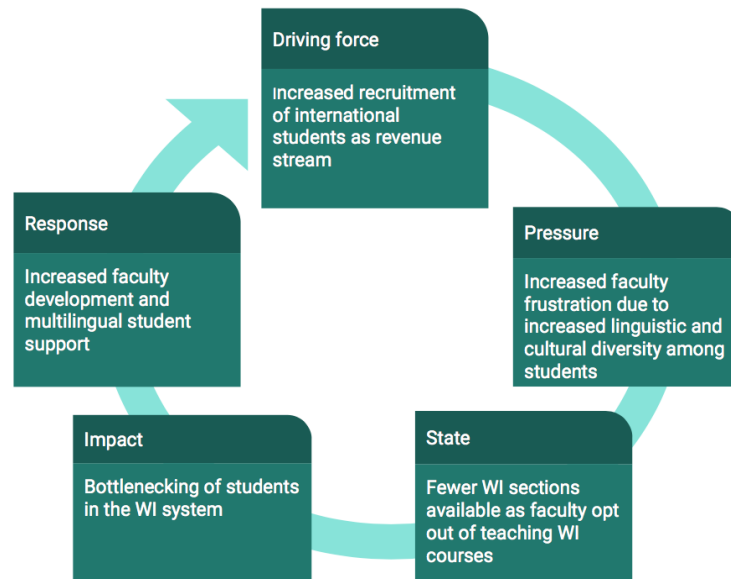
hurricanes and floods. *Responses* are the actions taken in reaction to the impacts, responses that attempt to prevent, eliminate, compensate for or reduce their consequences. For example, in response to the impacts of rising global temperatures, a government might sponsor incentives for increased use of solar energy. In sum, a driving force is a need that creates pressures, which result in a state that has significant impacts on a system that warrant response (Kristensen, 2004).

To explore how the DPSIR framework may work as a problem-solving heuristic, we return to the imagined WI program that has become unsustainable. Imagine this scene: the WAC committee is reflecting on the radar charts, which together depict a WI program increasingly spinning out of control. By examining the charts, the team comes to a reasonable conclusion that funding, support, and faculty willingness issues are the root problems of the WI program. But during the conversation about the scheduling bottleneck that prevented a significant number of students from enrolling in their required WI courses for the last two terms, committee members decide to further explore the issue of faculty willingness to teach WI courses. One colleague notes that the workload for WI courses is a bit higher than other courses in the major. Another suggests that faculty may be getting burnt out teaching the same courses regularly. A third wonders if faculty are teaching fewer of their own specialty courses. At that point, you (as WAC director) ask the key question, "Could there be something else contributing to the bottlenecks?" After all, this hasn't happened before, and the program had been around for several years. You suggest using the DSPIR process to unpack the problem. While one colleague confirms that faculty in her department are losing interest in teaching WI courses, another points to the increasing number of multilingual students in these classes. Several others agree, so the team shifts their attention. There has never been an SI tracking the impact of multilingual students on the program, so the committee digs a bit deeper.

All are aware of the national trend to increase recruiting efforts for international students, and this institution is no different. A committee member contacts the Office of International Students to confirm that international student enrollment has increased by 10% over the past two years. She also finds out that groups of students from China have recently been accepted for cultural exchange programs that do not require the same TOEFL standards that the admission office typically expects. It becomes clear that the drop in faculty interest to teach the courses is multidimensional, not only having to do with workload, dropping faculty and student support, and fiscal support, but also increases in international multilingual students.

These driving forces are creating pressure on faculty who are seeing an increase in linguistic and cultural diversity in their classrooms, which seems to be a contributing factor for faculty frustration and an important reason why faculty stop volunteering to teach WI courses. This shift in faculty behavior leads to a state of fewer available WI sections, creating bottlenecks for students and leading students and departments to request exemptions to the WI requirements. The source of the problem is not just the bottleneck, but rather is buried deeper in an institutional feedback loop of university-wide sustainability. While the WAC program cannot really change admission practices, it can provide faculty development on teaching multilingual writers, as well as increased support for these students, measures that lessen the impact of the demographic shift.

Figure 8: The DPSIR Framework Applied to WAC



In *Sustainable WAC*, we discuss the whole systems methodology as recursive, with a return to the Understand stage after collecting and analyzing SI data. The DPSIR framework helps us see how this recursivity works. Investigation of why fewer faculty were volunteering to teach WI courses led this imagined WAC committee back to the Understand stage to identify which elements of the wider university culture were leading to this resistance. Once drivers and pressures are identified, they can be turned into SIs that are tracked during the next iteration of the whole systems methodology.

Further, DPSIR provides the critical lens through which the radar charts can be evaluated. In the case above, the WAC committee realized they had missed an important indicator concerning international students. Had the committee not realized this important factor, any solution to the problem of class bottlenecks for students would not have had the needed impact within the university curricular ecology.

The Limitations and Possibilities of Tracking SIs for WAC Program Development

Tracking SIs in the whole systems approach may not always be warranted at the outset of program development as we had first argued in *Sustainable WAC*. The time and effort needed to quantify and assess SIs with a stakeholders group may not be warranted when programs are small and relatively uncomplicated, the impediments to program sustainability are obvious, and the WAC program has not matured to the point at which radar charts are needed to visualize program sustainability across multiple metrics. Only a small percentage of programs reach this point early in their development, though following the whole systems methodology and using strategies recommended in *Sustainable WAC* (including the articulation of and attention to SIs) will move them closer, as it has for Michelle's graduate communication support program.

Furthermore, as most program directors who have engaged in program assessment know, not all things that are worthy of assessment are measurable. Program directors may find SIs that defy measurement or are simply not worth the effort to collect the necessary data. FAU identified a range of possible SIs that the committee later rejected because of these considerations. Ultimately, there may be classes of SIs that will prove fundamental to the longevity of the program that cannot be reduced to a 0-6 point scale. As FAU works through the assessment process for a few cycles, they will have a better idea whether the SIs they have identified are sufficient to predict program longevity.

Such limitations, however, do not mean that this type of formative assessment is not worthwhile. As we note above, tracking SIs can be a powerful approach for articulating, in collaboration with stakeholders, what it means for a WAC program to be sustainable, focusing on elements that would increase the likelihood of sustainability, and presenting evidence to upper administration that could be used to argue for additional resources. Like FAU, some programs will find that undertaking this work ten years after the program began provides a valuable opportunity to re-envision and reinvigorate the WAC program. Others will find it useful from the very start to ensure a forward-looking perspective of the program. We hope that the clarifications about the SI tracking process articulated in this article remove impediments to using this method for those who are seeking its benefits.

As more WAC programs adopt the method of tracking SIs, more benefits will be seen. Pragmatically speaking, the process itself will become clearer and more user-friendly, as the materials they develop to do so become shared across programs. We are also likely to learn how to read and track nonreducible indicators as well. Broader SI use will also lead to research on the efficacy of tracking SIs in different programs types and states of maturity.

As part of this effort, we have formed a consortium of six institutions of higher education who will conduct institutional case studies while using and adapting the WSA to develop their WAC programs over at least two years. This longitudinal research will provide concrete examples of programs in progress to help us revise and improve the tactics and strategies we espouse. At some point, we hope to collect data from across a broader range of institutions to determine if it is possible to identify SIs that are common across like institutions and could provide benchmarks for program growth and overall viability, a step that has been taken with sustainable development internationally (Sustainable Development Solutions Network, 2015).

Appendix

While graphic representations of SIs can be represented in many ways, we have found that Bell and Morse's use of the AMOEBA graphs are compelling and provide below a detailed explanation of how program directors may develop them using Microsoft Excel. We realize that the technical process that we describe below is subject to change as the software changes, but we have ultimately decided to describe the process so that readers could build them more easily.

To create the charts in Excel on a Windows computer, select the full data set. Select the INSERT tab, then the third graph icon highlighted in the top row of the menu ribbon (see Fig. 9 below) and then the third radar graph option, "Filled Radar Graph."

Figure 9: Selecting the Correct Style of Graph

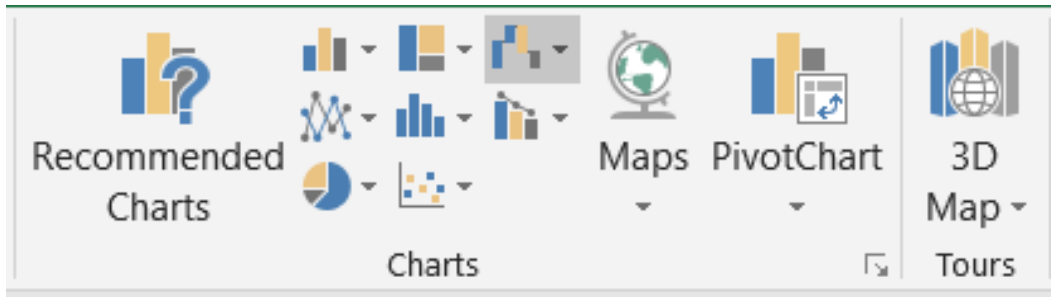
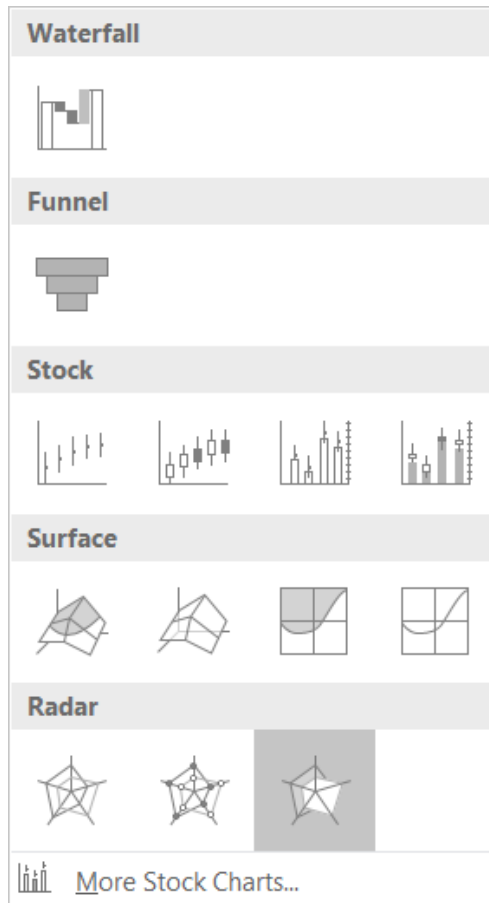
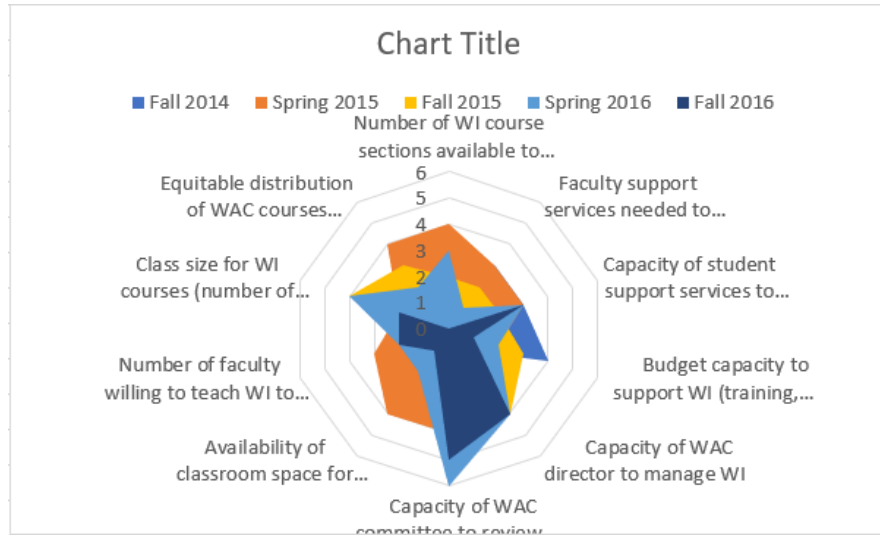


Figure 10: Selecting the Best Style of Radar Chart



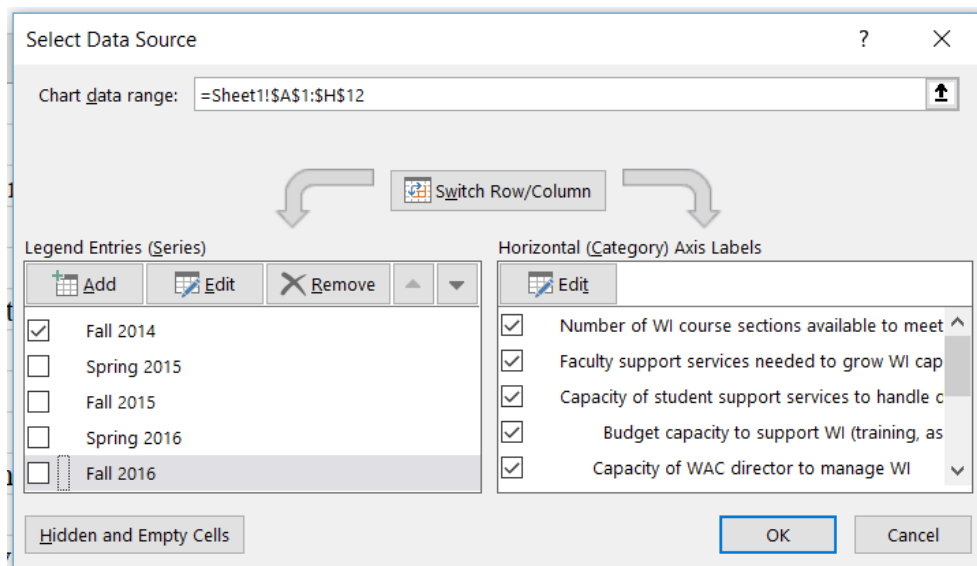
An unfinished multi-layered graph is produced:

Figure 11. Creating the Raw Radar Chart



Once the layered chart is created, size it proportionally by dragging one of the corners so all of the labels are legible. The graph shows all data sets superimposed on each other. To simplify the figure, right-click the chart area and choose “Select Data.” Uncheck all except the first data column. This step reveals only one data layer and sets up a template for all charts.

Figure 12: Choosing the Data for One Semester

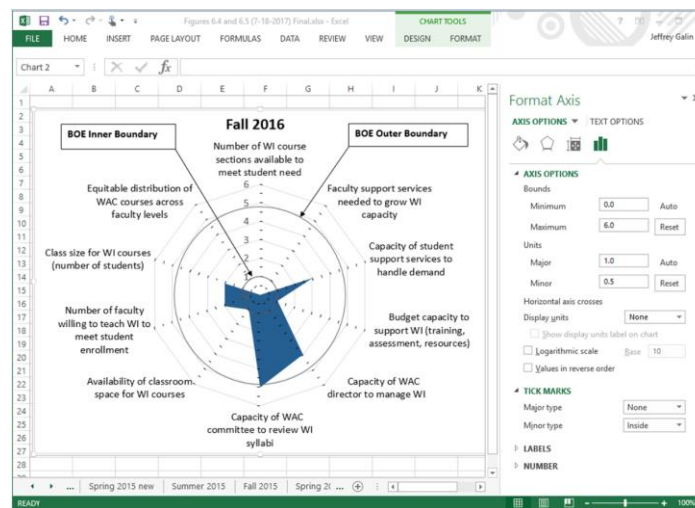


Right click on the exposed graph lines (not the colored plot area) and select “Format Axis.” Set “Maximum” “Bounds” to 6 for a 1-6 point scale, “Major Units” to 1, “Minor Units” to .5 and “Minor Type” “Tick Marks” to “Inside.” We also suggest deleting the remaining legend item and set the “Chart Title” to match the data set that is displayed. In Figure 13, this title is Fall 2016.

Then select the INSERT tab, “Shapes,” and then “Oval” to add the inner and outer bands of equilibrium. Select No Fill under the paint bucket icon for each. Figure 13 shows the values for Format Axis that result in the accompanying chart. To change default line colors, select the paint bucket icon in the Format Axis options. We chose Solid Line under Line options.

Once the master chart is created, we recommend copying and pasting this fully formatted chart into as many new Excel sheets in the workbook as there are data columns. Then right-click on the chart axis, choose Select Data, and check the appropriate data set for each sheet as well as unchecking the one that served as the template. These charts can then be pasted into Word files for reporting purposes. The trends they represent over time provide a representation of program change, resilience, and sustainability.

Figure 13: Radar Graph Settings



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Notes

- ¹ Acknowledgments: We would like to thank reviewers Mya Poe and Chris Thaiss, and Dan Melzer, who read an early draft of this manuscript, for their thoughtful and invaluable suggestions.
- ² In *Sustainable WAC*, we use the term “indicators of success and distress.” Here, we are changing the term to “signs of success and distress,” to avoid conflation with sustainability indicators.
- ³ We acknowledge that not all programs will be able to create an advisory board in its early years, as was the case for Michelle’s program. As a substitute, Michelle met with would-be stakeholders across campus, solicited their input, and built program components based on their recommendations. This proto-board model prevented her from being the sole decision-maker or being perceived as a lone actor, which are potential threats to sustainability.
- ⁴ Bell and Morse (2008) describe the origin of these radar charts as “AMOEBAs graphs” that have been traditionally used in the field of ecology to track indicator species and signal shifts in environmental equilibrium. They suggest that these graphs can even be created by hand to obtain a preliminary sustainability snapshot. Certainly, other systems of graphing can be used, but FAU found this one especially informative because it captures all indicators in a single figure and visually represents the band of equilibrium that marks the boundaries of sustainability.
- ⁵ Visit <http://www.fau.edu/wac/assessment/index/missionstatement.docx> to download the Excel Worksheet
- ⁶ For a full list of SIs based on FAU’s mission and goals, visit FAU’s WAC assessment website at <http://www.fau.edu/wac/assessment/>; select the link at the bottom of “Formative WAC Program Assessment using Sustainability Indicators.” The “SI Resources” section of this page has a link to the “full set of FAU SIs with the mission and goals” and another link to an Excel template for creating SI radar charts.

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