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Process Education is a performance-based philosophy of education which integrates many different educational theories, processes, and tools in emphasizing the continuous development of learning skills through the use of assessment principles in order to produce learner self-development.
International Journal of Process Education

Vision
The International Journal of Process Education will be a catalyst for the scholarship of teaching and learning in support of the efforts of the Academy of Process Educators to transform higher education.

Mission
To provide a forum for, and an archival record of, scholarly research in Process Education
To elevate skills in the discipline of the scholarship of teaching and learning
To explore promising new research areas in Process Education
To foster classroom-based research

Guiding Principles
All faculty, staff, administrators, and students can contribute to classroom research.
Every researcher’s methods can be continuously improved.
The term “classroom” is a metaphor for all learning environments.
Mentorship can accelerate the development of research skills.
There is a role for both quantitative and qualitative educational research.
Collaboration among authors, reviewers, and editors is critical for a vibrant research environment.
Increasing societal complexity and pace of change make it imperative to accelerate the transition from classroom discovery to disseminated findings that are the basis of shared practice.
An educational journal can be improved by regularly assessing all aspects of its operation.

The Academy of Process Educators drives transformational change in education by generating, disseminating, and archiving research based on Process Education™ principles through delivering an annual conference focused on timely issues, developing position papers related to concerns in higher education, promoting scholarship related to the process model of education, and reporting research on Process Education in the International Journal of Process Education.

To join the Academy of Process Educators or learn more, we invite you to visit us online at www.processeducation.org

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Production and Design: Denna Hintze-Yates

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From the Editorial Board

Welcome to the third volume of the *International Journal of Process Education*. In this issue, we are focusing on continuous improvement, which is a prime component of our philosophy. In addition, the authors have collaborated across different disciplines, organizational types, and geographical regions on topics that range from personal development to team and program development to the transformation of teaching and learning on a macro scale.

The first two articles discuss processes in the context of individual self-development:

Our opening article features Desjarlais and Smith discussing “A Comparative Analysis of Reflection and Self-Assessment.” The focus is to provide a thorough understanding of the practices of both processes and to provide a method to gauge the effectiveness of each.

In “Classification of Life Enrichment Skills,” Leise develops a new set of learning skills with inherent “themes” that build on each other: enhancing health and wellness, developing identity, enhancing quality of achievements, increasing the effectiveness of community involvement, and transforming meaning. This classification is intended as a guide to building skills related to living a satisfying and meaningful life.

The next two articles transition from individual development to broader interactions with groups internal and external to the institution:

“Ecological Leadership” by Harms and Leise discusses a systems perspective of integrating leadership performance with organizational priorities so that organizational goals are reached through an inclusive process. It suggests that by harnessing the knowledge and skills of individuals across the campus, better decisions and outcomes are possible.

In “A Methodology for Team Teaching with Field Experts,” Dong, El-Sayed, and El-Sayed share best practices for teaming with practicing professionals outside of the organization to provide students with a richer classroom experience. Collaborating with experts on the cutting edge of their discipline brings perspective through interaction and real life examples.

The next two papers focus on the continuous improvement of programs:

In “Faculty Efficacy in Creating Productive Learning Environments: Universal Design and the Lens of Students with Disabilities,” Utschig, Moon, Todd, and Bozzorg discuss a U.S. Department of Education-sponsored program which promotes the accessibility of science, technology, engineering, and mathematics (STEM) education for students with disabilities. The authors’ focus is to understand how this affects educators’ understanding and use of the concepts in their own classrooms.

In the other, “Lean Program and Course Assessments for Quality Improvement,” El-Sayed, El-Sayed, Morgan, and Cameron discuss lean principles within the context of program assessment as a process with the driving goal of improved quality.

The final paper, by Hintze-Yates, Beyerlein, Apple, and Holmes, deals with “The Transformation of Education: 14 Aspects.” This provides a view of foundational changes underway in higher education to improve understanding and vision for teaching and learning as a whole.

It is our hope that you will enjoy reading the contributions to our newest issue as much as we enjoyed working on it. As it is also part of our philosophy at the IJPE, I encourage you to send us any ideas or insights that you may have.

Sincerely,

Jacqueline El-Sayed, Chief Editor, *International Journal of Process Education*
A Comparative Analysis of Reflection and Self-Assessment

Melissa Desjarlais¹, Peter Smith²

Abstract

Reflection is a personal process that can deepen one’s understanding of self and can lead to significant discoveries or insights, while self-assessment is a process that involves establishing strengths, improvements, and insights based on predetermined performance criteria. In this paper we will perform a comparative analysis of reflection and self-assessment, clarifying the differences in definition, methodologies, and results. We will model a familiar situation using both processes to illustrate the need for doing reflection and self-assessment and to differentiate their separate purposes. In the process, we will elucidate some tips for engaging in reflection and self-assessment and for deciding which to process best suits a given situation; we will also discuss ways to evaluate their effectiveness.

Introduction

Reflection and self-assessment are both meaningful processes that can lead to learning from experience, yet they have different purposes and goals. Reflection is a process that involves playing back a period of time related to previous valued experiences in search of significant discoveries or insights about oneself, one’s behaviors, one’s values, or knowledge gained. Specific criteria for performance are usually not involved. An important goal in reflection is bringing focus to an indeterminate situation (Dewey, 1938) by gaining clarity and by fully experiencing what has happened. It is important to gain closure during reflection and not ruminate repeatedly about the experience. Reflection involves divergent thinking and often includes journaling. In contrast, self-assessment is a process used for studying one’s own performance in order to improve it. It is more proactive than reflection in that performance criteria are defined before the action in question begins or before it is replayed; and strengths, improvements, and insights (Wasserman & Beyerlein, 2007) against these criteria are then recorded during the process.

This paper will perform a comparative analysis of reflection and self-assessment. Methodologies for each will be described, and then an example of each will be provided. To highlight the steps of each methodology, the same example will be used of a student who is procrastinating on an assigned project. The paper will then identify specific similarities and differences of the two processes, and list tips both for helping someone decide which of these processes to use in a given situation, and for engaging in them. Finally, ways to evaluate the two processes will be given. The Appendix contains the products of the reflection and self-assessment example, i.e., the reflection log and self-assessment journal.

Literature Review

Joseph A. Raelin (2002) and Joy Amulya (2004) both stress the importance of reflective practice, and discuss why it is important. Raelin describes reflective practice as “the practice of periodically stepping back to ponder the meaning of what has recently transpired to ourselves and to others in our immediate environment.” He presents it as a public and open process by which an individual’s interpretations, evaluations, and assumptions are subjected to the review of others in order to avoid bias and errors in perceptions of reality. Amulya, on the other hand, focuses more on the process in general and less on whether it is an individual or collective experience. She states that the purpose of reflection is to learn from experiences. She describes certain experiences that can provide learning opportunities through reflection: struggles, dilemmas, uncertainties, or breakthroughs. Amulya suggests journaling as a way to think about an experience, a process which is advocated in this paper.

Stevens and Cooper (2009) describe perspectives on reflection and learning from experiences based on the work by John Dewey and D. A. Schon. They focus on how to perform effective reflection, describing it as an active, intentional, and journalistic cycle. For Dewey, reflection is an active and intentional process that can begin with some discomfort with an experience and end with learning and deeper insights. According to Dewey, aspects of reflective thought include perplexity, elaboration, generating hypotheses, comparing hypotheses, and taking action. As Stevens and Cooper describe it, the reflective phase involves focusing on what an experience means and how it is related to past learning. In comparison, Schon (1983) has two processes: reflection-in-action and reflection-on-action, which he describes as components of the development of expertise. In this paper, the focus is on reflection-on-action, the easier of the two processes.

These authors have each stressed the importance of reflection and have linked reflection to learning, yet self-assessment is a related and similarly important process. Apple and Utschig (2009) list self-assessment to produce self-growth as one of their ten steps for

¹ Valparaiso University
² Saint Mary’s College (retired)
improving academic assessment. They advocate taking time after daily performances to see how to improve future efforts. Leise (2007, 2007a) identifies the key role of self-assessment in sustaining self-growth through application of a personal development methodology. Myrvaagnes (2007) has created a rubric for self-growth which identifies the importance of self-assessment to move from one level of the rubric to the next.

Self-assessment is a universal process for improving learning skills. Leise (2007b) posits that learning to learn is a metacognitive competency which increases in proportion to improvements in reflection, self-assessment, and mentoring. According to Miller (2007), however, when one is trying to get buy-in from students in a course, it is best not to present self-assessment as a learning skill but rather as part of the course discipline. In his discipline, he tells students that self-assessment “is an integral part of real-world project development.” Anderson (2007) discusses the need for mentors to assess the self-assessments of beginners in order to raise them to levels where they become truly valuable. Her paper includes performance criteria and also a methodology for assessing assessments.

Students are not the only beneficiaries of self-assessment practices. Faculty should also strive to become self-growers. Myrvaagnes (2007) emphasizes that “self-growers have defining characteristics which include an enduring interest in assessment and self-assessment in order to maximize performance in every aspect of life.” Hurd (2007) holds that every faculty member should have an annual professional self-growth plan. She highlights the key role of self-assessment in her outline of the planning methodology.

Process Education is founded on assessment. According to Duncan (2007) it is “the continuous quality improvement (CQI) engine of Process Education.” In her paper, she examines the five developmental pathways embodied in Process Education and shows how central self-assessment is to each of them. Leise (2007c) claims that both “novices and experts can increase growth in process learning through cycles of assessment and reflection.” He also examines the process of internalizing these and other methodologies so that they become second nature.

Leise (2010) contrasts the Western and Eastern concepts of reflection and develops a methodology and a rubric for reflecting on performance from the point of view of a counseling professional. His reflection methodology is much closer to our definition of self-assessment in that it requires the specification of criteria, a self-assessment of the performance under reflection, and an identification of one’s position in the rubric. His focus differs from ours in that he restricts his study to reflecting on the performance of counselor interns, whereas we focus on valued experiences, not on performances. In this paper, we build on Leise’s theoretical work, making the concepts accessible to undergraduate students and faculty.

Even with all of this work done on reflection and self-assessment, there can still be confusion regarding the distinctions between these two concepts in terms of their purposes and outcomes. There are also no widely accepted methodologies for either process, and information about them can be found in multiple locations in the Faculty Guidebook. This paper will synthesize ideas from different areas of the Guidebook, provide formal methodologies, and show that it is important to distinguish between the two related processes. This is primarily a theoretical look at these two processes, yet there are many action research possibilities yet to be explored.

**Methodologies**

In this section (Table A), brief descriptions of the steps for each methodology are given and a discussion of each step is provided.

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<tr>
<th>Table A: Reflection and self-assessment Methodologies</th>
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<tbody>
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<td><strong>Reflection Methodology</strong></td>
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<tr>
<td>Recognize a need</td>
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<td>Pick a time and place</td>
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<td>Play back the experience</td>
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<tr>
<td>Document all insights</td>
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<tr>
<td>Play what-if games</td>
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<tr>
<td>Organize insights into common themes</td>
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<tr>
<td>Identify key insight(s)</td>
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<tr>
<td>Generalize key insights</td>
</tr>
<tr>
<td>Determine the need for other processes</td>
</tr>
<tr>
<td>Assess the quality of the reflection process</td>
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</table>
Reflection Methodology Discussion

**STEP 1**

**Recognize a need to reflect.**
This step can be initiated due to a hunch or expectation that there is something valuable to be gained by replaying a past experience. One may need to clarify some confusion that prevents the full experience from falling into focus.

**Define the purpose of the performance.**
This first step clarifies why the endeavor triggering the assessment is worth assessing and what the assessment hopes to accomplish. With this information the self-assessor (who is also the assessee) can better determine what is important to assess (Wiggins & McTighe, 2005).

**STEP 2**

**Pick a time and place for reflection.**
In this step, the reflector identifies a time and place that will minimize distractions and lead to a quality reflection. It may involve a mindless activity such as walking, chopping wood, weeding, etc. One needs to be prepared to record insights as they come to light. This recording can be in a written, electronic, or verbal format (such as a digital voice recorder). It may help to pair up with another person who can listen and record the components of the experience, and the insights gained. This is especially important for people who do their best thinking while speaking.

**Define the purpose of the self-assessment.**
Here, the assessor establishes the outcomes for the self-assessment and restricts attention to certain aspects of the performance being assessed, if appropriate. The motivation to perform the self-assessment may have come from an earlier reflection, but the goal is always personal development and improved performance.

**STEP 3**

**Play back the experience which triggered the reflection.**
In this step the reflector goes back through the experience slowly enough to examine each aspect. This should not be a mere recitation of the sequence of events, but an examination of components that may be significant. The reflector should try to engage all of the senses in this process, and pay particular attention to context and behavior, accomplishments, failures, skill level, knowledge level, and personal and fixed factors (Elger, 2007).

**Develop performance criteria for the self-assessment.**
Using the outcomes identified in Step 2, the assessor identifies the criteria by which to measure the success of the self-assessment. These should be understandable, measurable, realistic, and relevant to the outcomes. These criteria will help keep the assessment process focused. In most cases, there should be no more than four criteria.

**STEP 4**

**Document all insights in a reflection log.**
As the reflector replays the experience, all insights should be listed in a reflection log without any initial judgment on their quality or usefulness. Even if the insights are initially recorded orally, they should be transferred to a visual format, either on paper or a computer. Steps 3 and 4 may be iterated multiple times before moving on to the next step, because one insight may prompt the reflector to realize that earlier moments in the play-back need more careful examination.

**Determine attributes that indicate quality for each criterion.**
In this step, the assessor breaks down each criterion into attributes that can be easily measured. If the assessment is narrowly focused, one or more of the criteria may be clear and measurable enough in themselves that it will not be necessary to define their attributes.

**STEP 5**

**Play a lot of “what-if” games.**
This step allows the reflector to consider other possible outcomes to the experience. These alternate outcomes may come from the reflector’s own past performance or something he or she has read or heard. These other possibilities can be used to question the meaning and significance of the actual sequence of events, thus deepening and expanding the insights in the log.

**For each attribute or simple criterion, determine the evidence needed to perform the assessment.**
Evidence is important in order to judge whether the criteria are achieved successfully. The evidence should be readily accessible from the performance being assessed.
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<tr>
<th>Reflection Methodology Discussion</th>
<th>Self-Assessment Methodology Discussion</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STEP 6</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Organize a list of insights into common themes.</strong></td>
<td><strong>Select the scale and range to be used in looking at each piece of evidence.</strong></td>
</tr>
<tr>
<td>In this step, the reflector looks back over the list of insights generated and arranges them based on common elements. It may be useful to write the insights on separate slips of sticky paper and group them by themes before recording them in the log. This step is a preparation for Step 7 in which the reflector evaluates the quality of the insights.</td>
<td><strong>Measurement requires a scale and a range. If the evidence is carefully selected, these should be self-evident. The scale may be numerical or ordinal and should be sufficient to explain all gradations within the range. If in doubt, one should make the scale simple.</strong></td>
</tr>
<tr>
<td><strong>STEP 7</strong></td>
<td></td>
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<tr>
<td><strong>Identify key insights.</strong></td>
<td><strong>Collect and measure the evidence identified in Step 5 using the scale from Step 6.</strong></td>
</tr>
<tr>
<td>Once the insights have been organized by common themes, the reflector identifies those which are most significant and meaningful. This may involve rewriting them to combine several insights into one, and checking that no important insight has been omitted.</td>
<td>For this step it would be helpful to have already engaged in a reflection about the performance being assessed. The reflection or play-back will highlight evidence needed to conduct the assessment. The collected evidence should be connected directly to the performance. Each piece of evidence should be rated according to its scale.</td>
</tr>
<tr>
<td><strong>STEP 8</strong></td>
<td></td>
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<tr>
<td><strong>Generalize key insights to a wider set of situations.</strong></td>
<td><strong>Use the collected evidence to prepare a self-assessment report.</strong></td>
</tr>
<tr>
<td>The key insights which were identified in Step 7 may be somewhat specific to the past experience which initiated the reflection, or they may apply to a wider set of situations that can allow the reflector to derive greater value from the original experience. To raise the level of significance of the insight, it helps to ask the question “So what?” repeatedly, and then reword the generalized insight according to the answer.</td>
<td>In writing a self-assessment report, one determines and documents strengths, areas for improvement, and insights gained from conducting the assessment (Wasserman &amp; Beyerlein, 2007). It is thus referred to as an SII report, and it is the heart of the assessment. The main purpose of self-assessment is to help the assessor/ASSESSEE improve his or her performance and move along the path to becoming a self-grower (Leise, 2007). For each area for improvement, one should develop a short-term (what can be done immediately) and a long-term (what can be done in the future) plan of action. If previous action plans have been developed, they should now be assessed.</td>
</tr>
<tr>
<td><strong>STEP 9</strong></td>
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<tr>
<td><strong>Determine whether there is a need to for other processes.</strong></td>
<td><strong>Determine whether there is a need to engage in other processes.</strong></td>
</tr>
<tr>
<td>If, during the process of reflection, it becomes clear that an improvement in performance is necessary, the self-assessment process should be initiated to identify strengths, areas for improvement, and potential for an action plan to address some of the identified areas for improvement. Reflection can also lead to learning, problem-solving, research, design, and other processes. Since the problem-solving, research, and design processes are often confused with one another, it is useful to reflect on past situations in which a particular process has been identified and then decide which of these past situations is most similar to the given situation (Cordon &amp; Williams, 2007).</td>
<td>The self-assessment report for Step 8 may identify a need to do further reflection or to engage in learning, research, design, problem solving, or other processes in order to maximize growth or to fully implement the action plans. These processes are described in Beyerlein (2007).</td>
</tr>
<tr>
<td><strong>STEP 10</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Assess the quality of the reflection process.</strong></td>
<td><strong>Assess the quality of the self-assessment process.</strong></td>
</tr>
<tr>
<td>Identify the strengths, areas for improvement, and insights gained as a result of this process, being careful to focus both on the process of reflection, and the product that was generated (i.e., the reflection log).</td>
<td>Identify the strengths, areas for improvement, and insights gained as a result of this process, being careful to focus both on the self-assessment process and the product that was generated (i.e., the self-assessment report).</td>
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</tbody>
</table>
**Example of the Methodologies**

To illustrate a practical application of the methodologies that might be used in a classroom situation, let us use the example of a student procrastinating on a web design assignment. In our hypothetical situation, a project has been assigned that is due after Thanksgiving break. It involves the use of Dreamweaver™, which is a commonly-used web page design productivity software product. Although the project had been assigned several weeks before Thanksgiving, our student has put off starting it until he has gone home for Thanksgiving weekend. He discovers when he gets home that the Internet will be down at his house for the whole weekend. As a result he is unable to access any online references, nor can he look at examples of other web pages while he designs his project. Fortunately for him, he does have Dreamweaver™ on his laptop, so he is able to create the code, but he is unable to test it in a real browser.

When he gets back to school and is again able to access the Internet, he discovers a number of errors which he does not have time to correct before the paper is due. He explains the dilemma to his teacher who agrees to let him turn it in late with no penalty if he completes reflection and self-assessment reports in order to learn from his experience. The following is a description of his experience using the reflection and self-assessment methodologies.

<table>
<thead>
<tr>
<th>Reflection Methodology</th>
<th>Self-Assessment Methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Recognize a need to reflect.</strong></td>
<td>Define the purpose of the performance.</td>
</tr>
<tr>
<td>Our student thinks that this instance of procrastination, when analyzed, might help him produce better work in the future.</td>
<td>The performance being assessed is the preparation of the web design project.</td>
</tr>
<tr>
<td><strong>Pick a time and place for reflection.</strong></td>
<td>Define the purpose of the self-assessment.</td>
</tr>
<tr>
<td>He decides to do the reflection while taking a long walk in the afternoon after class. He believes that this setting will be relatively free from distractions.</td>
<td>The self-assessment outcomes are to minimize future procrastination and to improve the quality of similar performances in the future.</td>
</tr>
<tr>
<td><strong>Play back the experience which triggered the reflection.</strong></td>
<td>Develop performance criteria for the self-assessment.</td>
</tr>
</tbody>
</table>
| He plays back the experience. He recalls how he had received the assignment with a month of lead time; he remembers being too busy with other schoolwork and social activities to start it before Thanksgiving vacation; he replays his dismay at discovering that the Internet was down; he remembers doing his best to design the web pages in Dreamweaver™ (8 hours spent doing this, discovering 4 errors); he recalls how he returned to school and spent 5 hours discovering and correcting errors (6) and poor design flaws; he remembers how he tried to correct the errors (one not corrected) before class; he replays how he was forced to admit the problems to the teacher; and finally, he recalls how he was given a reprieve and was able to complete the project several days late, and not in a most efficient manner, although the appearance was acceptable. | Criteria for self-assessment:  
A. understanding the consequences of procrastination  
B. trade-off between the quality of the online web project vs. time spent in preparation  
C. quality of the testing process for the validity of the web pages and the embedded links |
### Reflection Methodology

**Document all insights in a reflection log.**

Since he forgets to bring a notebook on the walk to jot down his insights, he lists them when he returns to his room. This is what he discovers as a result of his reflection:

1. He often avoids what he doesn’t want to do and replaces those activities with more desirable activities.
2. He conveniently forgets to do unpleasant tasks, and should therefore write down daily tasks and tick them off.
3. He realizes that his project involved sections of code that were repeated several times. He might have saved himself some time had he saved these, as he would not have had to retype them or look back through the code to find them.
4. He notes that when coding in HTML, one of the most common errors is failing to close commands. Using Dreamweaver™, when the user gives the command `</`, the program tries to fill in the last open command; this helps catch unclosed commands before the user has gone too far.
5. He concludes that he ought to have tested the web project in more than one browser.
6. He decides that it would have helped had he accessed examples of similar web pages online as he designed his own in order to expand his ideas.
7. He realizes that he is a bad judge of the length of time required to develop such a project.
8. He notes that he also had a lot of work for other classes and that these took priority before Thanksgiving, particularly those involving group work and those with tests before the break.

### Self-Assessment Methodology

**Determine attributes that indicate quality for each criterion.**

**Attributes for criteria:**

| Criterion A: | number of consequences identified, connection of each to successful performance |
| Criterion B: | amount of time spent preparing, appearance of the web project, number of errors not spotted |
| Criterion C: | number of errors spotted, amount of time spent testing |

### Play a lot of “what-if” games.

He asks some “what-if” questions to get the insights above: What if he had not put off starting the project? What if the Internet had not been down at home? What if he had come back early from Thanksgiving break? What if he had saved key sections of code in a separate file to make it easier to reuse them? What if he had kept a to-do list? What if he had tested the project in different browsers? What if he had studied less for other courses or spent less time working in groups? What if he had not gone out with friends one night?

### For each attribute or simple criterion, determine the evidence needed to perform the assessment.

The evidence needed for this assessment is included in the reflection journal described above.

### Organize a list of insights into common themes.

From these insights he derives some common themes: timeliness, efficiency, web design criteria, project testing, time management, and setting priorities.

### Select the scale and range to be used in looking at each piece of evidence.

The only attributes whose scales are not numeric are “appearance” and “connections.” The scale for appearance might be “sloppy,” “acceptable,” “attractive,” and “spectacular.” The scale for connection might be “remote,” “reasonable,” and “close.”
## Reflection Methodology

**Identify key insights.**

He comes up with the following key insights:

1. Keep a journal with daily responsibilities and use it to set priorities.
2. Test web projects in Firefox™, Internet Explorer™, and Chrome™.
3. Use a sophisticated web page editor and learn how to use it well.
4. Procrastination can sometimes lead to a more efficient performance.
5. Preparation is the key to well designed projects.

**Collect and measure the evidence identified.**

<table>
<thead>
<tr>
<th>Listing of the evidence:</th>
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<tbody>
<tr>
<td>Consequences: The web project was completed several days past deadline and was not of the highest quality. To get full credit, he had to complete reflection and self-assessment reports.</td>
</tr>
<tr>
<td>Time spent in preparation: 8 hours. The web pages appeared acceptable. There was only one error not spotted after testing.</td>
</tr>
<tr>
<td>He spotted four errors during preparation and six errors while testing. Testing and error correcting time was 5 hours.</td>
</tr>
</tbody>
</table>

## Self-Assessment Methodology

**Generalize key insights to a wider set of situations.**

He arrives at these generalized insights:

1. Poor ability to judge time required to complete a task contributes to a hurry-up-and-crash situation, so he needs to set aside more time to accomplish things or be more efficient with the time he sets aside.
2. Keeping organized lists either on paper or electronically can reduce procrastination.
3. Good preparation, use of productivity tools, and efficient testing can all improve the web design process.
4. Procrastination can sometimes lead to more efficient performance, but often at the expense of quality.

**Use the collected evidence to prepare a self-assessment report.**

**Strengths:**

- Despite the delay, the web project appearance and performance were acceptable.
- The preparation time was reasonable compared to other projects.
- Dreamweaver™ made it easier to test the code during preparation.

**Areas for Improvement:**

- He needs to get the project finished by the deadline and improve its appearance to “attractive” or “spectacular.”
- Better planning will help, as will checking to see that Internet access will be available during preparation.
- He should not schedule so much on the days he will be preparing the next project.
- He should use a separate file to keep phrases needing to be repeatedly copied so that he doesn’t waste time looking for them.
- He ought to test the finished product in several browsers to make sure that its quality is good in all of them.

**Short-term action plan:**

- He will install the identified browsers on his laptop.
- He will clear the schedule for the next project deadline.
- He will practice testing the current project to make the process more efficient.

**Long-term action plan:**

- When the next assignment is given, he will get started with preparation plans right away.
- He will keep a file of frequent code segments and links to avoid having to search the main text for them.
- He will make a schedule/calendar of intermediate deadlines.
- He will develop a practice of regular reflection and self-assessment when needed.
### Reflection Methodology

**Determine whether there is a need to engage in other processes.**

He observes that using a self-assessment process including a formal SII and short and long-term action plans would be helpful in improving his project performance in the future.

**Assess the quality of the reflection process.**

He assesses the reflection process itself.

- **Strengths:**
  - He gained insights that have helped him better understand procrastination habits and its consequences.
  - Walking helped develop a good flow of ideas.
  - The rich set of insights will help him improve the project completion process in the future.

- **Areas for Improvement:**
  - He must find a way to jot down insights while walking, perhaps by carrying a notebook or by using a digital voice recorder.
  - It was hard to do the “what-if” analysis as a separate step, and perhaps he might combine Steps 4 and 5.
  - He did not allocate enough time for the reflection process, so he needs to set aside more time in the future so that he does not feel rushed.

- **Insights:**
  - The reflection seemed to center less on the procrastination problem and more on the efficient production of the web project.
  - The reflection process is not really linear, as thinking about one piece sends one off on a tangent. As a result, some insights may not be directly connected to the original triggering event.
  - Knowing why one procrastinates can help minimize this practice in the future.

### Self-Assessment Methodology

**Determine whether there is a need to engage in other processes.**

There is no need to employ further processes at this time. Perhaps there will be a need for problem solving and design if the current action plans are not effective.

**Assess the quality of the self-assessment process.**

He assesses the reflection process itself.

- **Strengths:**
  - He developed workable criteria.
  - He came up with practical action plans.

- **Areas for Improvements:**
  - He should have identified the evidence specifically for each attribute in Step 5.
  - He should have included insights in the self-assessment report.

- **Insights:**
  - The key to using self-assessment to improve performance is careful construction of the action plans.
  - Working through the reflection methodology before doing the self-assessment methodology results in a much richer analysis.

Collecting the evidence needed for the assessment in the reflection journal has the advantage of engaging a person in the process of reflection before starting a self-assessment.

### Comparative Analysis

From a search of the literature, it has become evident that most authors blur the distinction between reflection and self-assessment, with a tendency to emphasize the former. Burke (2009), however, shows that while both reflection and self-assessment can lead to learning from an experience, they are distinct processes with different motivations or purposes. This paper expands on previous work by identifying some of the differences between the processes, as specified in Table B:

<table>
<thead>
<tr>
<th>Reflection Methodology</th>
<th>Self-Assessment Methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Determine whether there is a need to engage in other processes.</strong></td>
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</tr>
<tr>
<td>He observes that using a self-assessment process including a formal SII and short and long-term action plans would be helpful in improving his project performance in the future.</td>
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<td><strong>Assess the quality of the self-assessment process.</strong></td>
</tr>
<tr>
<td>He assesses the reflection process itself.</td>
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</tr>
<tr>
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<td>- <strong>Strengths:</strong></td>
</tr>
<tr>
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<tr>
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<td></td>
</tr>
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<tr>
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<td></td>
</tr>
</tbody>
</table>

The two processes differ in terms of the initial motivations, situations which call for each process, how each process should be done, and what their goals are. People use reflection when there is the expectation or desire to gain insights about themselves by reflecting, while they use self-assessment to improve future performance by identifying strengths and areas of improvement. This initial motivation can come from different sources: people are often internally motivated to engage in reflection, since individuals may suspect that insights can

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**STEP 9**

**STEP 10**
be gained through that process; and while these insights may indicate a need for self-assessment, there can also be external motivation for self-assessment from supervisors or colleagues.

The time required for doing these processes can differ, both in terms of the starting time and the block of time needed. It is important to do the reflection as soon as possible after the experience since the play-back of the experience is a crucial step in the process. The experience should be “fresh” so that the reflector is able to focus on significant components. On the other hand, in conducting a self-assessment, it may be necessary to wait to determine potential ramifications of the performance. Knowing these will aid in the self-assessment process. The block of time available for each process can differ. In the process of reflection it is important to have an uninterrupted period of time to allow for the play-back of the experience and identifying insights. In the process of self-assessment it is possible to stop and start; for example, someone can pause the process between identifying strengths and areas for improvement.

The differences in motivation and goals of the two processes lead to reflection being backward-looking and reactive, since people reflect on past experience; and self-assessment being forward-looking and proactive, since the strengths and areas for improvement will be used to improve subsequent performances. Also, the reflection process tends to be kept private, while self-assessment is a tool leading to self-growth that should be shared with a mentor if one is available. The goal of reflection is “knowing”; the goal of self-assessment is “growing.”

While there are some distinct differences between the processes of reflection and self-assessment in terms of the reasons or ways of doing them, they also share some qualities. Some of the similarities between reflection and self-assessment include the following. Both are:

- Structured
- Sequential
- Targeted
- Based on an earlier experience or performance
- Improved through analysis
- Internal
- Meaningful
- Important in improving quality
- Conducive to learning (about self or content)

The two processes are structured, sequential, and targeted. There is a methodology for each process that describes the steps that should be taken and the order in which they should be done, and these steps are targeted to help the individual achieve the desired outcomes of each process. Each process is based on an earlier experience or performance and requires the analysis of the experience or performance, yet both can be very meaningful processes for improving the quality of life. Also, any of the possible outcomes of either process can lead to learning, either about oneself or content that one is to learn for a course. Thus, these two processes do have some significant similarities.

It is also instructive to examine the similarities and differences between the products of the reflection and self-assessment processes (i.e., the reflection log and the self-assessment report). Table C illustrates the differences:

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Reflection</th>
<th>Self-Assessment</th>
</tr>
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<tbody>
<tr>
<td>Outcome</td>
<td>Insights</td>
<td>Strengths and areas for improvement</td>
</tr>
<tr>
<td>Control</td>
<td>Internally motivated</td>
<td>Could be externally motivated</td>
</tr>
<tr>
<td>Timing</td>
<td>Do as soon as possible after experience</td>
<td>Wait until ramifications of performance are clear</td>
</tr>
<tr>
<td>Continuity</td>
<td>Important to have an uninterrupted period</td>
<td>Less important—could stop and start</td>
</tr>
<tr>
<td>Focus</td>
<td>Reactive (response to an experience)</td>
<td>Proactive (lead to future changes)</td>
</tr>
<tr>
<td>Direction</td>
<td>Backward looking</td>
<td>Forward looking</td>
</tr>
<tr>
<td>Criteria</td>
<td>No performance criteria</td>
<td>Have performance criteria</td>
</tr>
<tr>
<td>Thinking</td>
<td>Divergent thinking (what if?)</td>
<td>Convergent thinking</td>
</tr>
<tr>
<td>Audience</td>
<td>Private</td>
<td>Mentor and others</td>
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</tbody>
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</tr>
</tbody>
</table>
**Tips**

This section will help the reader to decide whether or not to engage in reflection or self-assessment, which process to choose, and how to go about each process. Once experienced, the value of these processes will be appreciated, and, after consistent use, they will become second nature.

A key first step in the process is to identify the need to do either of these processes (Table D). Sometimes there is a critical or motivating event that can indicate this need. Often doing one process can indicate the need for doing the other, which indicates a cyclical component to the two processes. Even when there is no specific triggering event, it can be beneficial to occasionally review these tips to determine whether there may be a benefit gained from employing these processes.

Once it has been determined that one of the two processes should be done, the implementation phase can be made much more productive and effective if one follows the tips outlined in Table E, and may result in success that will lead a person to want to continue to employ these processes in the future.

These first sets of tips help with either initiating or performing the processes, while the next set of tips apply after the processes are complete. Evaluating their effectiveness can lead to the continual use of the processes.

**Evaluation**

After doing a reflection or self-assessment, it is important to evaluate the effectiveness of the process. Table F provides some questions that can be answered to perform this evaluation.

Determining that a process is effective can mean that someone will continue to reflect and self-assess to gain a better understanding of himself or herself, and to improve future performances.

**Conclusion**

This paper clarifies similarities and differences between reflection and self-assessment with respect to their purposes, outcomes, work products, and tips for high quality implementation. It suggests many areas for future study, including analysis of these methodologies in specific classroom settings. The formal methodologies outlined in this paper for reflection and self-assessment, along with the synthesis of ideas from different areas of the *Faculty Guidebook*, provide a foundation for this work. Classroom studies might start by collecting initial data (both quantitative and qualitative) about the frequency and quality of reflection and self-assessment done by each student and his or her understanding and perceived importance of the two processes. This could be followed by providing orientation on two methodologies, including critical thinking about examples similar to those used in this paper. Throughout an entire term, students might then use both methodologies, generating a collection of reflection logs and self-assessment reports. At the end of the study, data could be collected again, similar to what had been initially collected. Some goals of such a study might be to try to measure change in the quality of the reflection and self-assessment done by the students, and how their understanding has changed.

As a result of writing this paper, the authors came to appreciate the cyclical nature of reflection and self-assessment. While discussing the role of reflection in transforming learning during the last few months, it became clear how important this concept was to many faculty and administrators dedicated to Process Education. The most helpful reference was the theoretical treatise, “Improving Quality of Reflecting on Performance” by Cy Leise (2010). Leise looks at the history of reflection and develops a methodology oriented toward improving the performance of counseling professionals. Our reflection and self-assessment methodologies are more accessible to undergraduate students and all who are interested in better understanding their experiences or improving the quality of their performances. It is our thesis that reflection and self-assessment can quickly become second nature, and are essential practices for anyone who wishes to become a self-grower.

**Table C: Differences between Reflection Log and Self-assessment Report**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Reflection Log</th>
<th>Self-Assessment Report</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scope</td>
<td>Deals only with insights</td>
<td>Includes strengths and areas for improvement</td>
</tr>
<tr>
<td>Growth</td>
<td>Not in a format to promote self-growth</td>
<td>Contains short and long term action plans</td>
</tr>
<tr>
<td>Tools</td>
<td>Helps focus thinking</td>
<td>Performance criteria infuse entire report</td>
</tr>
<tr>
<td>Audience</td>
<td>Private: unlikely to be shared</td>
<td>Should be shared with mentor</td>
</tr>
<tr>
<td>Follow-up</td>
<td>Not so important</td>
<td>Action plans must be monitored</td>
</tr>
</tbody>
</table>
### Table D: Tips for deciding when to do reflection or self-assessment

#### Tips for deciding when to do a reflection
- When you have a hunch that there is something to be gained by replaying a past experience
- When you begin to question yourself
- When there is a discrepancy between your values and actions
- When you are searching for discoveries about yourself, your behaviors, your values, and knowledge gained
- When stress reaches a critical level

#### Tips for deciding when to do a self-assessment
- When the value of a self-assessment is indicated during reflection
- When you want to improve yourself through a well-thought-out action plan
- When you want to improve a particular performance by identifying strengths and areas for improvement
- When there is an external requirement, such as completing an annual performance report.
- When suggested by a mentor

### Table E: Tips for doing reflection and self-assessment

#### Tips for doing reflection
- Do it as soon as possible after the performance.
- Avoid overstructuring the play-back. Let it flow.
- Find a time and place where the experience can be freely replayed and where insights can be recorded as they occur.
- Be attentive to when the play-back situation "talks back" and respond to this backtalk (Schon, 1983).
- Don't wait for the "perfect time" to do reflection; set aside a regular time.
- Listen to feelings: explore their sources.

#### Tips for doing self-assessment
- Wait until all ramifications of the performance are clear before assessing.
- Attempt to isolate one’s feelings when identifying the purpose and criteria for the assessment.
- It is helpful to perform a reflection before doing a self-assessment.
- Identify a place free of distractions.
- Don’t wait for the “perfect time” to do self-assessment, set aside a regular time.
- Set up the assessment before the performance by identifying the performance criteria.

### Table F: Ways to evaluate reflection and self-assessment

#### Ways to evaluate reflection effectiveness
- Did you derive value from the process?
- Were the insights gained of high quality?
- Did the final assessment (Step 10) indicate the need for significant improvement?
- Was stress minimized?
- Were the insights generalizable to a larger set of situations?

#### Ways to evaluate self-assessment effectiveness
- Did the process result in a clear and doable plan of action?
- Were you motivated to make the identified improvements?
- Did you give a “why” for each strength and an action plan for each area for improvement?
- Did the performance criteria guide the assessment process?
- Do you see new or continuing opportunities?
Acknowledgments
The authors would like to acknowledge the assistance provided by Cy Leise, through his doing a sample reflection and providing feedback, and Steve Beyerlein, through his participation in multiple conversations about the paper and offering helpful suggestions. Thanks to Dan Apple for being the stimulus for the idea of the paper.

References


# Appendix

## Reflection Log

### 1. Components of the Experience
- Received the assignment with a month lead time
- Was too busy with other schoolwork and social life to start it before Thanksgiving vacation
- Discovered that the Internet was down
- Did best to design the web pages in Dreamweaver™ (worked for 8 hours and identified 4 errors)
- Returned to school and discovered and corrected 6 errors and poor design flaws (worked for 5 hours)
- Tried to correct the errors before class (failed to correct one)
- Was forced to admit the problems to the teacher
- Received a reprieve and completed the project several days late, and not in a most efficient manner, but the final appearance was adequate

### 2. Insights from the play-back
- He often avoids what he doesn’t want to do and replaces those activities with more desirable ones.
- He conveniently forgets to do unpleasant tasks: he should write down daily tasks and tick them off.
- He realizes that there were sections of code that could have been repeated several times. It would have saved time had he saved these so he would not have had to retype them or look back through the code to find them.
- When coding in HTML, one of the most common errors is failing to close commands. Using Dreamweaver™, when the command </ is given, the program tries to fill in the last open command. This helps catch unclosed commands before going too far.
- He should have tested the web project in more than one browser.
- It would have helped had he been able to access examples of similar web pages when designing his own in order to expand his ideas.
- He discovered that he is a bad predictor of how long such a project takes to develop.
- He also has a lot of work for other classes and these took priority before Thanksgiving, particularly those with group work and those who gave tests before the break.

## Self-Assessment Report

### 1. Greatest Strengths and Why
- Despite the delay, the web project appearance and performance was acceptable
- The preparation time was reasonable compared to other projects

### 2. Areas for Improvement and Action Plans
- Need to get the project finished by the deadline and improve its appearance to attractive or spectacular.
  - Short-term plan
    - clear the schedule for the next project deadline
    - practice testing current project to make the process more efficient
  - Long-term Plan
    - When the next assignment is given, get started with preparation plans right away
- Test the finished product in several browsers to make sure its quality is good in all of them
  - Short-term Plan
    - install the identified browsers on his laptop
  - Long-term Plan
    - When testing the next assignment use all of the installed browsers
<table>
<thead>
<tr>
<th>3. <strong>Other possibilities from what-if analysis:</strong></th>
<th>3. <strong>Assessment of performance against previous action plans</strong></th>
</tr>
</thead>
</table>
| **What if—**  
• he had not put off starting the project?  
• the internet had not been down at home?  
• he had come back early from Thanksgiving?  
• he had saved key sections of code in a separate file to make it easier to reuse them?  
• he had kept a to-do list?  
• he had tested the project in different browsers?  
• he had studied less for other courses or spent less time working in groups? | **No previous plans** |

<table>
<thead>
<tr>
<th>4. <strong>Insights from other possibilities</strong></th>
<th>4. <strong>Personal Growth most enhanced by:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No new insights</strong></td>
<td><strong>Stepping through the self-assessment methodology</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5. <strong>Common themes</strong></th>
<th>5. <strong>The reason why I grew is:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>timeliness, efficiency, web design criteria, project testing, time management, setting priorities</td>
<td><strong>I realized I was in control of improving the quality of my projects</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6. <strong>Key Insights:</strong></th>
<th>6. <strong>My attitude toward learning was:</strong></th>
</tr>
</thead>
</table>
| • Keep a journal with daily responsibilities and use it to set priorities.  
• Test web projects in Firefox, Internet Explorer, Chrome, and Bing.  
• Use a sophisticated web page editor and learn how to use it well.  
• Procrastination can sometimes lead to a more efficient performance.  
• Preparation is the key to well-designed projects | **Very positive** |

<table>
<thead>
<tr>
<th>7. <strong>Generalized insights:</strong></th>
<th>7. <strong>The most valuable insight I learned about myself is:</strong></th>
</tr>
</thead>
</table>
| • Poor ability to judge time to complete a task contributes to hurry-up-and-crash situations, so he must set aside more time to accomplish things or be more efficient with time set aside.  
• Keeping organized lists either on paper or electronically can reduce procrastination.  
• Good preparation, use of productivity tools, and efficient testing, can all improve performance.  
• Procrastination can sometimes lead to more efficient performance, but often at the expense of quality | **knowing why I procrastinate can help minimize this practice in the future** |
### Assessment of the process:

**Strengths:**
- gained insights that have helped him better understand procrastination habits and its consequences
- walking helped develop a good flow of ideas
- the rich set of insights will help him improve the project completion process in the future

**Areas for Improvement:**
- find a way to jot down insights while walking; perhaps carry a notebook
- it was hard to do the what-if games as a separate step; perhaps combine Steps 4 & 5
- he did not allocate enough time for the reflection process; set aside more time so that he does not feel rushed

**Insights:**
- the reflection seemed to center less on the procrastination problem and more on the efficient production of the web project
- the reflection process is not really linear, as thinking about one piece sends one off on a tangent. As a result, some insights may not be directly connected to the original triggering event.

### Knowing this will improve my performance by:
making it more likely I will start the next project in time to complete it with high quality
Classification of Life Enrichment Skills

Cy Leise

Abstract

The Faculty Guidebook (Beyerlein, Holmes, & Apple, 2007) includes complete skill sets for cognitive, social, and affective domains. In the 1950s, Benjamin Bloom and his associates published educational goal taxonomies for psychomotor as well as cognitive and affective domains (Anderson, et al., 2000). However, many other skills are important for the development of a meaningful life such as those that promote physical and mental wellness, and the making of decisions and strategies related to identity development and personal lifestyle, community involvement, and the search for personal meaning. Learning-to-Learn Camps, faculty development institutes, personal growth plans, and many other Process Education™ interventions have been developed to promote personal and professional growth. The research basis for the Classification of Life Enrichment Skills is from scholarly fields such as positive psychology, adult development, counseling psychology, and community action models. The use of themes, rather than a hierarchy of processes, as in the learning skill domains, has been adopted to make clear that there are “lower” items in the classification that are required to support movement towards “higher” items. A table of life enrichment skills provides examples that illustrate potential uses of the classification as a tool whose use can be generalized beyond the skills presently included. Many intervention models in education, counseling, life coaching, pastoral work, and community action might be enhanced by establishing themes and skills that need to be incorporated for successful processes and outcomes related to empowerment in any context.

Introduction

Ask an educator to identify the learning skills students need for a given activity and he or she is likely to have difficulty. Ask why the activity is important and how the objectives will help learners to meet real life concerns and there will be an elaborated response. The Classification of Life Enrichment Skills has been developed, in part, because of the author’s experiences with connecting learning skills to learning activities. Clearly, a stated purpose needs to help both educators and learners to recognize some practical situations for which the learning can be applied. A more efficient means of selecting key learning skills tends to be that of starting with life enrichment skills and working backwards to the relevant learning skill foundations, because context can then be articulated more naturally.

Life enrichment is a broad concept intended to describe the processes that philosophers describe as problems of life, e.g., Magee (1997), or the search for meaning, e.g., Frankl (2000). How individuals meet challenges in life often opens doors for further development—or closes them. Because infants and young children depend on caretakers to provide a sustaining and stimulating environment, adults who become parents, and those who provide support services for children, need competencies related to this complex role. Adolescents and young adults engage the world in ways that reflect the unevenness of their explorations of interests that result in identity formation. The growth of adults as self-determining individuals includes moving into many roles (e.g., parenting, working, and community involvement) that depend on personal development—and also provide challenges to personal development. Educators work with learners of all ages and have considerable influence on the life success of many beyond the facilitation of learning skills, e.g., most people remember a favorite teacher or role model. The Classification of Life Enrichment Skills includes ways of behaving that are related to creating, sustaining, and enhancing a high-quality life for others as well as for self because an enriched life emerges from enriching the lives of others.

A classification of the life enrichment skills is not directly analogous to that of learning skill domains (cognitive, social, affective, and psychomotor) because life enrichment does not include a clear hierarchy of processes. For example, in the social domain, communication skills are essential for teamwork, management, and leadership; life enrichment skills for community involvement can be highly developed even if a person does not attend to personal wellness. In general it might be argued that maintaining wellness increases the probability of continuing with community action projects longer and with more energy, but there is not a direct competency connection. To address this and other logical inconsistencies, the life enrichment skills are classified into “themes” with skill clusters and specific skills identified under each theme.

Life enrichment skills, as identified, are often related to complex life goals that must be achieved in real contexts. Therefore skills included in life enrichment themes are not personal characteristics; although individuals who grow in certain skills are typically described in terms of having positive traits, as argued by Peterson and Seligman (2004). Like learning skills, life enrichment skills can be assessed in terms of performance quality.

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This allows the inference that additional themes can be developed for any purpose, e.g., Cattaneo and Chapman (2010) describe how human service staff increase empowerment of clients at a shelter by applying a model they designed and evaluated. Such models can be deconstructed into life enrichment themes and skills, some of which are from learning skills domains. The life enrichment skills often require learning skills as a foundation, e.g., women in a shelter program must learn how to process information, communicate, and plan as they address safety, legal matters, and work in ways that have potential to add structure to their lives.

The quality of a learning skill competency must meet some minimum standard in order to support further learning of more complex skills in the domain hierarchies. The same competency rubric (Table 3) can be applied for assessing life enrichment skills as that used for learning domain skills; however, stronger quality of performance in any life enrichment skill should not be assumed to be a predictor of success in related or more complex life enrichment skills. The principle for learning skill domains is that some combination of skills lower in the hierarchy must be learned to the level of competency required in real performance contexts to support a more complex skill. Leaders must communicate well with people in any context, but that is only one prerequisite among many. The principle for life enrichment skills is that adult developmental outcomes can be supported in many ways. Quality of competence remains a key issue even though the connections among the themes, skill clusters, and specific skills remain only probabilistic. Themes are important for life enrichment because patterns are more relevant than hierarchies of skills.

The classification of life enrichment themes and skills is a representation of positive mental, social, and physical health at the “action” level. By turning theories, models, and principles into practice, this new tool can be used to analyze and implement many kinds of human intervention programs. The principles upon which the life enrichment classification is based include the following similarities and differences from the learning skills.

**Similarities:**

1. Developmental and language skills are essential for increasing life satisfaction.

2. The Theory of Performance applies to life enrichment skills because using the skills effectively is influenced by the six factors that determine performance quality.

3. Life enrichment skill clusters are analogous to learning skill clusters, i.e., they are related but are considered to be a sample of skills rather than a complete set.

4. Life enrichment skills can be assessed using the same competency rubric used for learning skills.

5. Learning skills are most valuable for educators who tend to work in structured learning environments.

6. Life enrichment skills are valuable for educators in their work to facilitate growth for learners with varied ways of being, developmental challenges, and life problems that reduce achievement.

**Differences:**

1. Life enrichment themes represent substantive areas of adult development presented in themes—practical life patterns—that include skills integration across the learning domains.

2. Many life enrichment skills, such as being hopeful, represent interim affective processes that are important to mental health and often indicate status outcomes correlated with happiness and satisfaction.

3. Life enrichment skills are processes that can produce much more varied outcomes than are typical of learning skills.

4. Life enrichment skills do not occur in a systematic hierarchy but have patterns of relationship that can support the development of increased complexity of skills overall.

5. Life enrichment skills are valuable for professionals, including educators, who are concerned with facilitating growth in individuals and groups for general life success and for advancement in integrated goal achievements, e.g., for graduate preparation goals.

The skills in the life enrichment classification are based on the assumption that a person can “call upon” any of the learning skills to achieve a life enrichment goal. This classification is presented to exemplify themes and skills that are important for achieving empowerment related to living a satisfying and meaningful life in all its dimensions. The themes presented include enhancing health and wellness, developing identity, enhancing quality of achievements, increasing effectiveness of community involvement, and transforming meaning. The types of skills in the present classification can be assessed using competency levels established for the learning skills from unengaged use to transformative use.
Research Foundations for a Life Enrichment Skills Classification

The research used for establishing the significance of the life enrichment classification is mainly from psychology and counseling. The themes, processes and skills included all have relevance for practical growth in how to live meaningfully and effectively. One of the strengths of current behavioral and social science research is an increasing recognition of the social context even of skills that have tended to be considered individual in the past. Social learning theory (Bandura & Locke, 2003) has long included other people and the environment in a reciprocal feedback pattern of influence on individuals. People who have close relationships over a long time period influence each other’s identity as well as behavior; role models have substantial effects too. Attitudes of individuals and groups about goal achievement can be positive or negative, and even psychological defenses can be “turned” to positive effects by emotionally skillful individuals. Inferences about life enrichment skills can be drawn from many kinds of behavioral and professional research so the classification must be considered a work-in-progress.

Increasingly psychological researchers, (e.g., Fitzsimons & Finkel, 2010; Poortviet & Darnon, 2010) consider the social contexts within which goal seeking and self-regulation occur. Much is known about self-regulation processes (e.g., Baumeister, Schmeichel, & Vohs, 2007) such as delay of gratification, focus on effective performance, growth in self-efficacy, and self-awareness; however, less is known about social influences on these processes. Rusbult, Finkel, and Kumashiro (2009) present evidence for a “Michelangelo Phenomenon” involving the possibility that interpersonal influences “sculpt” perceptions and behaviors in ways that lead toward or away from an ideal self or identity. If one partner learns how much the other admires a recent action or achievement, e.g., preventing a late fee by taking care of a credit card bill or graduating from an academic program, it is internalized in positive terms for identity and self-esteem.

There is substantial interest in the interpersonal correlates of goal initiation, pursuit, and monitoring, as well as goal mastery versus performance (e.g., Fitzsimons & Finkel, 2010; Poortviet & Darnon, 2010) Even reminders by a person closely associated with achievement, e.g., a parent one wishes to please, will result in greater activation of performance if that will clearly elicit approval. More positive examples include role models and relationship partners who share and support the initiation of goals that are related to the personal growth of another, a variation of the Michelangelo Phenomenon previously mentioned. Poortviet and Darnon argue, in a manner consonant with Process Education (PE), that interpersonal and social factors need to be considered as part of any achievement context in order to avoid effects such as conflict, negative social comparisons, and evaluation of certain types of goals as desirable or utilitarian, e.g., one type of career is better because income is likely to be higher.

When social interactions are efficient in terms of energy directed to work on a goal rather than to organizing efforts or conflict, it increases synchrony and a sense of support by all parties. Monitoring of goal-seeking progress can be negatively influenced by social comparison with those who are more successful, but it can also be positively influenced by the awareness that friends and significant others believe in one’s capabilities. Current reality TV shows often include cooking or decorating challenges that are complicated by requiring competitors to suddenly switch to a team task; frequently performance quality drops substantially due to disruptions caused by doubts about the competencies or motives of peers. Research often identifies negative effects and outcomes of social interaction processes, so it is necessary to focus on positives that are identified or to use inference to detect such skills.

Cattaneo and Chapman (2010) present a model for a process of empowerment in social or community contexts. They consider knowledge, competencies, and self-efficacy to be fundamental to effective goal-setting. In their social justice work with poor women who have suffered from abuse and prejudice, they emphasize power-oriented goals that are personally meaningful but also beneficial to others in a social or community system; e.g., becoming self-sufficient is admired by the public and likely to be supported. In Cattaneo and Chapman’s synthesis of empowerment, power is moved away from a strictly individualistic purpose to goals that inspire investment, commitment, and motivation towards actions in collaboration with others for a common good.

Related research on self-determination and goal setting is consistent with the model, e.g., Bandura and Locke (2003), Locke and Latham (2002), and Deci and Ryan (2000).

Vaillent (2000) argues that even psychological defense mechanisms, which are usually viewed as negative features of mental health adjustment, can be viewed as creative and adaptive ways of handling experiences involving loss, extreme change, trauma or abuse, and physical disabilities. By “sublimating” his pain and angst from headaches, deafness, and depression, Beethoven was able to create his Ninth Symphony, a powerfully joyous work. Even individuals with normal
adjustment and mental health must deal with conflicts of conscience, unpleasant relationship problems, serious health issues, and many other challenges in ways that allow them to go on despite all. Some use humor or simply suppress strong emotions for a time until they can cope better. A number of skills that turn defense mechanisms into positive strategies are included in the present classification. Cognitive biases, e.g., Piattelli-Palmarini (1994), also play a strong role in controlling how people interpret situations; so gaining awareness of how this occurs and how to counter with logical, reality-based interpretations adds to success in managing many problems of living.

Any process can produce highly varied outcomes. Maintaining hope during stressful times is an important ability that is correlated with personal resilience. Leipold and Greve (2009) argue, however, that the past theoretical conceptualization of resilience as a protective trait needs to be changed, because it is circular reasoning to say that a person survived adversity simply due to his or her resiliency; instead resilience can be conceptualized as processes of coping that add to the self-regulatory learning of individuals during development. Recognition of the limitations of traits, even those like resilience, is an important theoretical rationale for designing the Classification of Life Enrichment Skills around problems of living. This is further illustrated in Peterson and Seligman’s (2004) work.

The concept of a classification similar to the one proposed here for life enrichment skills has important predecessors. The most systematic approach from a positive psychology perspective has been by Peterson and Seligman (2004). They identified, using extensive scholarly and analytic methods, a set of 24 “character strengths” that they believe to be universal across individuals and, for the most part, across cultures. They argue that the term “classification” is appropriate because a taxonomy requires a clear theory; e.g., evolution has shaped all life forms over long periods of time, so the ancestry of any contemporary species can be “fit” into the biological taxonomy on the basis of empirical research evidence. Character traits can be described but they cannot currently be placed into a logical taxonomy pattern that will withstand empirical evaluation or remain stable across contexts.

The lists of character strengths in Peterson and Seligman’s (2004) classification are organized around a “high six” set of virtues, to contrast with research on the “big five” personality factors (e.g., McCrae & Costa, 1997) for which there is substantial empirical support. They also contrast their strengths-based classification with the mental illness classification represented by the Diagnostic and Statistical Manual (DSM-IV-TR, American Psychiatric Association, 2000). These high-six or “core” virtues include courage, justice, humanity, temperance, transcendence, and wisdom. Under each virtue the authors identified several “families” of related traits, e.g., hope has related traits of optimism, future-mindedness, and future orientation. Finally, there are “situational themes” that must be taken into account when assessing how an individual actually demonstrates a character strength due to contextual influences such as social and performance stimuli. They believed that situations vary so significantly that the identification of character traits would be most appropriate for their purposes.

Although Peterson and Seligman (2004) carefully established ten criteria for the selection or rejection of their character strengths, there are significant issues that distinguish their approach from the life enrichment skills classification proposed here, which is based on Process Education performance skills. The performance theory of Process Education (Elger, 2007) creates a clear framework for moving character strengths from universal traits to performance skills presented at a level useful to educators and other practitioners. The skills are not always clearly differentiated from goals but all can be achieved through learning and the growth of selected skills within a problem situation. There is a degree of hierarchical complexity to the themes selected that match adult developmental processes but this is not always consistent with easily observable behavior and accomplishments of people.

The ten criteria of Peterson and Seligman for the selection of character strengths illustrate the difficulties with using a trait rather than a performance approach. In Table 1, their ten criteria are paraphrased in the left column; in the right column one or two questions are suggested that challenge their character strengths classification criteria from a Process Education performance theory perspective. Even though they concluded that it is not feasible to identify skills useful in situations, the hypothesis of the present life enrichment classification is that performance in situations is the real issue. This position is further supported by the theory of Mischel and Shoda (1995). They summarize research to argue that traits are stable only in the sense that individual variation includes “cognitive-affective units” (p. 246) that predict how someone will tend to act across different situations. In real life people react and select in complex and dynamic patterns rather than in correlation with traits that lead directly to behavior choices.
Sources for Life Enrichment Themes and Skills

Life enrichment themes and skills can be drawn from a variety of scholarship and practice resources. Some of the sample resources in this list directly identify life enrichment skills; others provide a basis for inference of opposite skills or strategies.

Positive and Humanistic Psychology

Viktor Frankl (2000) is well known for his reflections on how he maintained hope during a long period in a Nazi concentration camp; his insights and those of Maslow (1970) helped to launch the humanistic psychology movement after WWII. Fredrickson (2001) exemplifies the more recent extension of humanistic theory in her positive psychology analysis of the differences between immediate coping reactions versus future-oriented responses that require a learning and growth investment.

Wellness Principles

Most college curricula include wellness because of its importance for improving general physical and mental health, including addiction issues. Hoeger and Hoeger (2010) address the full range of wellness and fitness issues with emphasis on how the social and cultural environments affect individual achievements and growth in motivation management of nutrition, exercise, and stress as major ways to reduce risks.

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Table 1

Questions about Peterson and Seligman’s (2004) Character Strengths Selection Criteria from a Process Education Perspective

<table>
<thead>
<tr>
<th><strong>Peterson &amp; Seligman’s Criteria</strong></th>
<th><strong>Process Education Issues</strong></th>
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<tbody>
<tr>
<td>1. Fulfilling to individuals</td>
<td>What are the readiness and motivation foundations that result in fulfillment?</td>
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<tr>
<td>2. Valued in its own right</td>
<td>What influences one’s choices to use strengths?</td>
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<tr>
<td>3. Use of a strength doesn’t diminish other people present</td>
<td>Should authentic use of strengths be controlled by social factors?</td>
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<tr>
<td>4. Opposites to strengths should not be equally “felicitous,” e.g., honesty vs. tact; rudeness is the true opposite</td>
<td>Should measures be focused on growth rather than changes in use?</td>
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<tr>
<td>5. General across situations and time</td>
<td>Should the basis for generalization be the expansion of the skill rather than a trait? How can the quality of learning situations be improved?</td>
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<tr>
<td>6. Distinct: cannot be decomposed into other positive traits</td>
<td>Can a hierarchy of skills explain the composition of more complex traits? How do the skills in the learning domains support life enrichment skills?</td>
</tr>
<tr>
<td>7. Consensual agreement about the existence of “paragons” for each character strength</td>
<td>What are the developmental differences that result in skill “paragons,” i.e., experts?</td>
</tr>
<tr>
<td>8. Paragons usually exist</td>
<td>What is meant by a paragon or expert in moral decision-making or kindness? Is there a logical pattern of development for each non-cognitive skill?</td>
</tr>
<tr>
<td>9. Some lack a character strength, e.g., due to a neurological disorder</td>
<td>How well does the PE “foundations of learning” approach work with extreme cases?</td>
</tr>
<tr>
<td>10. Societal institutions support positive character strengths</td>
<td>How can negative outcomes be prevented, e.g., from ineffective processes? Are skills used in specific contexts, e.g., teamwork, less valuable than universal traits?</td>
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</table>

This important distinction means that an enriched life requires hard work to develop many kinds of personal potential but also requires readiness to cope and adjust to the unexpected. Self-determination theory (e.g., Deci & Ryan, 2008; Burton, Lydon, D’Allessandro, & Koestner, 2006) is an active area of research and practice within positive psychology that emphasizes the factors that support individual effectiveness and control.
Professional Practice Models

Practical information and knowledge in any field provide insights that can be used to identify skills useful for success and growth. Sommer, Ward, and Scofield (2010) describe uses of metaphor in the supervision of counseling interns. Resilience is an important factor that varies by individual but can be increased, e.g., Singh, Hays, and Watson (2011) explored resilience strategies of transgender individuals. Lawson and Myers (2011) analyze wellness strategies for counseling professionals.

Motivation and Goal Models

Maslow’s (1970) hierarchy of needs is a motivation model but he does not explicate the skills for actually addressing the needs. Indirectly, it does provide guidance for inferring life enrichment themes and skills. The model is based on the hypothesis that present motivational needs tend to have a hierarchical pattern, e.g., lack of food or shelter will preempt attention to social and emotional development. Situational factors clearly make a difference but do not mean that a person’s higher aspirations won’t return if the situation changes. Leise (2006) prepared a “primer” of motivational models for teachers. Locke and Latham (2002) present a research-based goal theory. Duckworth, Peterson, Matthews, and Kelly (2007) have explored the factors that support “grit,” the ability to persist with long-term goals.

Process Education Learning Skills

The Process Education Theory of Performance (Elger, 2007) provides a foundation for identifying skills that are likely to foster a continual pattern of self-growth. Strength-based perspectives have a similar value for keeping a focus on what to do to enhance skills rather than focusing on improving weaknesses. Life enrichment requires many “process” skills (cognitive, social, affective, and psychomotor) that vary in complexity and context according to purpose, development, and capabilities.

Self-Management in Social Contexts

The social context defines and triggers many personal and professional goals. Ability to effectively pursue goals depends on self-regulation processes for cognition, emotion, behavior, and motivation, which are constantly influenced by the people, opportunities, barriers, and other aspects of situations and environments (e.g., Poortvliet & Darnon, 2010). All professional roles, including counseling, life coaching, mentoring, and educating, require many skills in the social domain because of the effects of these contexts on decisions and problem solving.

Self-Regulation Research

An additional perspective regarding the life enrichment classification is that self-development depends upon the self-regulation of behaviors, emotions, and behaviors for the purpose of increasing wellness, identity and self-concept, lifestyle, community involvement, and spirituality in ways that will provide strong motivation for life-long growth in all learning domains. (e.g., Leise, 2007.)

Empowerment Models and Programs

Most education and human services programs include empowerment of effective action by individuals (e.g., Cattaneo & Chapman, 2010). Self-efficacy (Bandura & Locke, 2003) and dealing with psychological or sociological “power issues” are common themes for community action projects. Bower, Moskowitz, and Epel (2009) argue that “benefit-finding” is a valuable mental health strategy for reshaping ones views about negative stressors. Riggio (2008) argues that leadership research and practice need to have more focus on how leaders develop the dynamic skills needed to facilitate the empowerment of followers.

Clinical Counseling and Psychology

The professional focus on psychopathology by counselors and clinical psychologists can be viewed as the opposite side of a coin: often the opposite of negative behaviors and reactions or defense mechanisms is a positive coping strategy or a strategy for overcoming personal challenges that are common for most people. Vaillent (2000) identifies how psychological defense mechanisms can be applied strategically for positive outcomes. Wohl, DeShea, & Wahkinney (2008) consider how self-forgiveness is an important strategy related to improvement of psychological well-being. Psychological sources of cognitive dissonance (Festinger & Carlsmith, 1959) and bias (Piattelli-Pamarini, 1994) often influence individuals and groups toward unrealistic or even damaging choices; learning the positive side of these processes clarifies decisions and problem-solving strategies.

Developmental Patterns

Because development is, by definition, ongoing, it is described in terms of phases or of processes that drive change and growth. Current research (e.g., Greenwood, 2007) indicates that there is substantial flexibility in cognition and adaptation throughout life for healthy individuals. Developmental theories are well known for general child and adolescent development but also are available for specific kinds of development. Parker (2011) describes how counselors can address spirituality
as a developmental issue. Grieving and other adjustment reactions have received substantial research attention as have models for values and beliefs, which provide structure and hope for people regardless of their specific religious affiliations. Spiritual and cultural practices are also important resources for articulating how people find meaning in life.

**Life Enrichment Themes**

As illustrated in Table 2, five main themes comprise the present life enrichment classification; these have been chosen because they are central for personal development in many theories and philosophies of life. Health and wellness skills are essential for continuous, lifelong mental, emotional, and behavioral performance at a satisfying level of competency. Developing one's identity is a basis for actualizing the potential one has in personal accomplishments, including the roles one will be ready to play in the larger society. Enhancing quality or achievements is part of creating a quality lifestyle, which must include taking risks and making the commitments that will result in sustainable and satisfying relationships and full enjoyment of important achievements in life, such as maintaining a home and one's position in a community. Connecting with a larger community includes involvement in ways that increase resources and advocacy for the quality of life of others, including those unrelated to oneself.

An ecological system, with reciprocity and other feedback “loops,” supports the vigor and creativity of community leadership by those who are effective in addressing issues beyond their own control. Integrating universal meaning includes formulating and living a life philosophy, experiencing a sense of awe about the universe, and a spirituality that integrates all aspects of living a quality life.

**Life Enrichment Skill Clusters**

Clusters of skills are identified under each of the life enrichment domain processes. As many as five clusters support each process area and each skill cluster contains up to a half-dozen unique, but closely related skills. In Table 2, skill clusters are arranged as the second level of the table format (left column); the specific skills are the third level (right column); there is no special significance to the order in which the clusters or the learning skills within a cluster appear in the table. Although the themes may have some hierarchical relationships, e.g., health and wellness is helpful for the other four themes, it is easy to identify contrary examples. Similarly the skill clusters and skills are not hypothesized to have any special connections or prerequisite competency requirements with any others.

Nevertheless, in life situations such connections can be discerned, so the overall organization is intended to provide some guidance.

There are several skill clusters within each of the five themes (Table 2): enhancing health and wellness, integrating identity, enhancing personal achievements, facilitating empowerment in community, and transforming meaning. Clusters, e.g., staying physically healthy and coping with illness, include a critically analyzed sample of the main skill areas that are essential for supporting lifelong development of each process, e.g., cooking healthily and exercising for fitness. Each cluster, in turn, provides a critically analyzed set of concisely defined and complementary life skills that are judged to be a reasonable sample for each cluster within each process.

**Themes, Clusters, Skills**

1. Skill clusters are the basic performance identifiers, versus specific skills in learning domains, because there is much more variation in how life enrichment can occur.

2. Each skill cluster is related to a goal that requires decisions and readiness to act. Learning skills will often be a part of the skill complex required for effective achievement of goals for life enrichment.

3. Interpersonal contexts are an important dimension of performance or accomplishment at all levels. As indicated in the research review, many choices and behaviors are heavily influenced by social context, so life enrichment efforts will be effective only if supported by effective social and affective learning skills. Having the foundation skills is not the same as pursuing a life goal that requires them.

4. Like the learning skills, all life enrichment skills require engagement and self-regulation of motivation, i.e., a person must recognize what needs to be done, and do it, even if past habits work against making effective choices. A person who avoids challenges because of potential failure must self-regulate motivation by taking risks to demonstrate competencies to self and others.

5. Some life enrichment skills overlap with skills from the learning domains. The classification is intended to be a model or guiding pattern to support the creation of customized themes and sets of skills for specific learners, clients, patients, or participants.

6. These are criteria that can be applied to test whether a reasonable balance of skills are included within a theme or cluster:
a. Timeframe, e.g., immediate coping reactions, planning of strategies for current challenges, and prevention of longer-term problems
b. Motivational self-regulation, e.g., abilities related to managing situations rather than letting situations, others, or conditions be in control
c. Empowerment focus, e.g., of self or others
d. Social involvement, e.g., leading versus being an effective follower
e. Meaning, e.g., from personal experiences, reflection, philosophizing, writing

Two different skills from the life enrichment domain are analyzed in Table 3: managing health challenges and supporting effective leadership. These two examples illustrate how specific skills can be demonstrated at very low levels (without conscious engagement) on a continuum through transformative use of the skill. Monitoring the proficiency of the learning skill along a common developmental continuum can be an effective motivator for learners as well as a useful guide for facilitating educators and mentors.

Applications

The Classification of Life Enrichment Skills is intended as a frame of reference or perspective for identifying important life change goals or aspirations. Providing

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<tr>
<th>Skill Clusters</th>
<th>Specific Skills</th>
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<tr>
<td><strong>ENHANCING HEALTH AND WELLNESS</strong></td>
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</table>
| 1. Gathering health information | - Learning about nutrition—identifying personal food needs  
- Identifying health challenges—recognizing when to use medical/professional resources  
- Gathering objective information—expanding professional diagnostic judgments with quality knowledge resources  
- Monitoring changes in capabilities—gathering qualitative data about physical, emotional, social, and cognitive reactions |
| 2. Staying Physically Healthy | - Cooking healthily—learning food selection and preparation skills  
- Maintaining healthy weight—balancing calorie intake with weight goals and “set point” (body’s current standard)  
- Optimizing nutritional choices—establishing and maintaining a healthy diet  
- Exercising for fitness—establishing an effective physical fitness routine for age and health status  
- Maintaining one’s physical performance—adapting fitness routines to changes in strength and response latency (“primary” capabilities) |
| 3. Staying Mentally and Emotionally Healthy | - Recognizing and addressing stressors strategically—improving reactions to stressors by implementing plans for managing both negative and positive stressors  
- Making behavioral changes—managing health challenges  
- Maintaining adaptive emotional strategies—recognizing evidence for the effectiveness of uses of “secondary” strategies as “primary” capabilities decrease |
| 4. Coping with Illness | - Recognizing medical issues—making reasonable judgments about treatment of illness or injury  
- Objectifying beliefs about pain— influencing subjective beliefs with medical explanations of pain  
- Benefit finding—finding positives from stress and illness  
- Collaborating with professionals—taking recommendations seriously while remaining open to alternatives  
- Promoting support systems—reinforcing essential helping  
- Making behavioral changes—adjusting realistically to support treatment  
- Managing health challenges—activating secondary strategies and resources when primary abilities are reduced in vigor |
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<tr>
<td><strong>Developing Identity</strong></td>
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| 1. Establishing Identity | • Differentiating self from others—recognizing similarities and differences from others  
• Expanding self-concept—increasing awareness of multiple factors relevant to self  
• Increasing self-esteem—increasing confidence in self  
• Using humor  
• Clarifying interests—discovering what is engaging  
• Becoming consistent with personal values—refining internal congruence  
• Striving for growth—moving toward an ideal self |
| 2. Self-Regulating | • Monitoring internal reactions—noticing differences in effects of experiences  
• Generalizing self-control strategies—consciously maintaining control of personal reactions  
• Rationalizing unavoidable conflicts of conscience—moving on from irresolvable situations  
• Anticipating negative events—preparing to adjust affectively through imagination  
• Taking account of the influences of others—adjusting to social factors  
• Caring for self in stressful contexts—managing self-care in a consistent manner  
• Applying an assessment mindset—gaining performance insights from any feedback |
| 3. Expanding Interpersonal Skills | • Enjoying social activities—engaging with others in play and recreation  
• Valuing others—avoiding exploitation and negative social comparisons  
• Exploring trust—learning who is dependable in ethical decision making  
• Learning from ethically ambiguous experiences—establishing values in real contexts  
• Being assertive—differentiating stubbornness and passivity from social effectiveness  
• Collaborating—working with others to achieve goals |
| 4. Developing Motivational Control | • Persisting—maintaining focus despite disruptions and barriers  
• Articulating factors in past successes—recognizing how past challenges were managed  
• Monitoring progress with goals—recognizing when to change methods  
• Being flexible in strategies—changing methods in thoughtful ways to overcome barriers  
• Using strengths—selecting strategies based on self-knowledge from past performances  
• Generalizing from past successes—predicting how to increase the probability of future performances |

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<th>Skill Clusters</th>
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<tr>
<td><strong>Enhancing Quality of Achievements</strong></td>
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</table>
| 1. Establishing Relationships | • Committing—risking choices that eliminate alternatives  
• Sharing responsibilities—being interdependent in the achievement of goals  
• Communicating honestly—keeping secrecy out of relationships  
• Sharing resources—cooperating in the use of time, finances, and roles  
• Affirming—valuing others through behavior |
| 2. Setting Life Goals | • Setting educational goals—planning training or education needed for career goals  
• Setting financial goals—planning a balance of short and long-term responsibilities  
• Setting career goals—planning a career path consistent with skills and interests  
• Adjusting to change—reacting to change and stressors  
• Re-setting priorities—being open to the revision of plans to meet new contingencies  
• Being self-efficacious—implementing in real time |
| 3. Caring for Others | • Parenting—facilitating development  
• Leading a family—being in control of family dynamics  
• Facilitating achievement—guiding the learning and accomplishments of others  
• Minimizing waste—recycling and preserving resources for sustainability |
### 4. Creating a Lifestyle Consistent with One’s Identity

- Maintaining satisfaction with work—staying focused on positive contributions
- Being constructive in exchange skills—focusing on objectives beyond self
- Balancing intrinsic and extrinsic life goals—avoiding extremes in valuing
- Being realistic in self-efficacy predictions—accurately assessing competencies
- Valuing objects for quality—making mid- to long-term choices
- Valuing objects for utility—selecting objects and technology for needs
- Being energized by life choices—staying focused on potential

### 5. Managing Social Support

- Maintaining contacts—assuring continuity of friendships and acquaintances
- Seeking social support—finding individuals or groups who can help
- Sharing conflicted feelings about needing help—being open with caregivers
- Valuing relationships with others—letting others know they are important

### INCREASING THE EFFECTIVENESS OF COMMUNITY INVOLVEMENT

<table>
<thead>
<tr>
<th>Skill Clusters</th>
<th>Specific Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Joining and Belonging</strong></td>
<td>• Recognizing quality leadership—observing a leader’s process and outcomes</td>
</tr>
<tr>
<td></td>
<td>• Joining valued organizations—selectively seeking out groups whose values are consistent with one’s own</td>
</tr>
<tr>
<td></td>
<td>• Collaborating with leaders—taking action in concert with group positions</td>
</tr>
<tr>
<td></td>
<td>• Being altruistic—sublimating personal emotions into energy for others</td>
</tr>
<tr>
<td></td>
<td>• Supporting effective leadership—using persuasion to influence other followers</td>
</tr>
<tr>
<td><strong>2. Community Change</strong></td>
<td>• Recognizing quality leadership—finding evidence that a leader demonstrates balanced performance</td>
</tr>
<tr>
<td></td>
<td>• Using an assessment mindset—being open to clarification about how to perform better</td>
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<tr>
<td></td>
<td>• Collaborating with a leader—taking on roles that will actualize a shared vision</td>
</tr>
<tr>
<td></td>
<td>• Challenging a leader—helping a leader avoid “groupthink” by asking for consideration of a diversity of perspectives</td>
</tr>
<tr>
<td></td>
<td>• Persuading others to value a leader—making balanced arguments in discussions with potential followers</td>
</tr>
<tr>
<td><strong>3. Working on Empowerment</strong></td>
<td>• Identifying “power” issues—gathering information on unjust treatment</td>
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<td></td>
<td>• Constructing advocacy models—creating strategies for just change</td>
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<tr>
<td></td>
<td>• Perceiving benefits of performance improvements—interpreting change needs in relation to needs of others</td>
</tr>
<tr>
<td></td>
<td>• Facilitating self-efficacy—supporting interventions that promote growth in competencies</td>
</tr>
<tr>
<td></td>
<td>• Promoting self-determination—supporting identity and self-concept in action contexts</td>
</tr>
</tbody>
</table>

### TRANSFORMING MEANING

<table>
<thead>
<tr>
<th>Skill Clusters</th>
<th>Specific Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Transforming Defensive Reactions</strong></td>
<td>• Taking a mental time out—recovering from an emergency by stepping out of emotional states</td>
</tr>
<tr>
<td></td>
<td>• Sublimating—redirecting emotional energy to positive ends</td>
</tr>
<tr>
<td></td>
<td>• Reducing cognitive dissonance—using reason and “discounting” to influence interpretations</td>
</tr>
<tr>
<td></td>
<td>• Hoping with realism—using expectations to guide satisfaction with goal attainments</td>
</tr>
<tr>
<td></td>
<td>• Adjusting expectations—using standards flexibly as guides</td>
</tr>
<tr>
<td></td>
<td>• Assessing goal attainment—finding satisfaction with progress</td>
</tr>
<tr>
<td></td>
<td>• Monitoring defensiveness—recognizing positive uses of criticism</td>
</tr>
<tr>
<td></td>
<td>• Generating alternatives—creatively moving beyond barriers</td>
</tr>
</tbody>
</table>
2. Mindfulness and Reflection

- Savoring the moment—attending intensively to present experience
- Being humble—reflecting on assumptions about the world
- Using humor to change perceptions—delicately reorienting reactions to negative events
- Being temperate—maintaining balance in all aspects of living and relating
- Minimizing influences of technology on values—recognizing how technology changes priorities

3. Wisdom and Self-Actualization

- Using wisdom—accessing insights from great thinkers
- Acting wisely—using past and present wisdom about living a meaningful life
- Acting courageously—selecting times and issues to take decisive action
- Being humane—treating people and all life with respect
- Being independent in life goals—developing intrinsic motivation for important life paths
- Mentoring—being a positive influence for others’ independence

4. Spiritual Development

- Seeking the transcendent—valuing spiritual experiences
- Accepting ambiguity—recognizing the impossibility of certainty
- Articulating beliefs—continually constructing one’s belief system
- Symbolizing—representing values and beliefs in multiple ways
- Committing to universal principles—assuming that wisdom extends beyond one’s reference group
- Challenging spiritual development—searching for new levels of insight about life and beliefs

<table>
<thead>
<tr>
<th>Level of Competency</th>
<th>Description of Individual Response</th>
<th>Examples:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level 5</strong> Transformed Use</td>
<td>Skill is expanded and integrated with other skills for creative, productive application in novel contexts; inspires others to emulate use</td>
<td>a. Supports others with similar challenges, e.g., by involvement in a diabetes self-help group</td>
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<tr>
<td></td>
<td></td>
<td>b. Engages others in reasoned debate about the qualities of multiple leaders in historical context as a source of reflective analysis</td>
</tr>
<tr>
<td><strong>Level 4</strong> Self-Reflective Use</td>
<td>Effective use of skill by learner; skill can be self-improved and adapted to unfamiliar contexts with occasional advice from a mentor</td>
<td>a. Plans a positive lifestyle that is consistent with maximizing treatment outcomes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b. Reflects on leadership qualities needed to influence valued change for a community</td>
</tr>
<tr>
<td><strong>Level 3</strong> Self-Motivated Engagement</td>
<td>Skill used routinely and effectively in multiple contexts through learner self-direction; not able to advance without external coaching</td>
<td>a. Assertively self-manages to maintain compliance with medical advice</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b. Assesses leaders on the basis of multiple criteria regardless of personal agenda</td>
</tr>
<tr>
<td><strong>Level 2</strong> Use Influenced by Context</td>
<td>Skill used knowingly, possibly proactively, by learner, but skill needs to be constantly challenged by a mentor</td>
<td>a. Inconsistently follows medical advice due to continued susceptibility to past habits and influences, e.g., eating foods friends prefer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b. Assesses leaders in terms of their congruency with one’s personal preferences or needs.</td>
</tr>
<tr>
<td><strong>Level 1</strong> Unengaged Use</td>
<td>Use of skill initiated by a prompt or influence external to the learner; unintended use of skill</td>
<td>a. Passively accepts “fate” or feels overwhelming anxiety or depression, e.g., in reaction to a diagnosis of diabetes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b. Emotionally accepts or rejects a leader without assessment</td>
</tr>
</tbody>
</table>

_table 3: Examples of Competency Levels for Two Life Enrichment Skills_
an open model, with present themes and skills intended as exemplars, presents users with the opportunity to explore creatively, to identify the most important insights about life skills needed for any context or purpose. Two examples illustrate.

Counseling interns working with the author often express concerns about self-care because of unexpected emotional reactions (referred to as counter-transference), especially when clients have experienced severe neglect and trauma. The life enrichment skills for this problem come from multiple themes, including wellness, identity, achievement, and finding meaning. Successful resolution of personal reactions requires interns, like all mental health professionals, to establish “boundaries” by recognizing the value of reducing their own subjectivity through emotional self-control and through improved cognitive representation of their professional role for helping in limited ways. Resilience (e.g., Leipold & Greve, 2009) clearly increases as interns grow in coping skills and maintain wellness practices that stabilize their daily rhythms. Self-assessment and reflection on performance helps to establish effective strategies that reduce anxiety and lead to fuller attention to clients. Over time, therapists who find their role to be a source of satisfaction will gain wisdom from both successes and failures as exemplars of humanity in all of its contradictions.

Educators who facilitate Learning-to-Learn Camps or college success courses based on Foundations of Learning (Redfield & Lawrence, 2008) must confront multiple barriers that are influencing learning, and establish new, positive strategies that are effective for learning and growth. Among the themes and skills important in this work are wellness, identity, teamwork, life goals, self-assessment, and reflection. Students enter with low expectations of themselves but with hope for change. Gaining control of basic cognitive, social, and affective skills improves their performance and changes their attitudes, especially about themselves and their potential. By keeping a focus on how to change their lives, these programs assure that most of the participants take charge of their own learning and recognize how to distinguish what they can do for themselves from what they should pursue with guidance from teachers, mentors, or life coaches.

Concluding Thoughts

Educators are a special audience who can use the classification to help with the identification of learning skills. They can identify life enrichment themes and skills to support their selection of learning skills around the meaningful concerns of their students to help motivate “buy in” and engagement in reflective, self-assessed learning. As students reach the upper-level work in their majors, career and lifestyle issues become increasingly important to integrate as part of preparation for the job market. Mentors, life coaches, counselors, community organizers, and spiritual leaders can use this classification tool to identify holistic and meaningful ways to challenge life enrichment goals of clients and followers.

The broader audience for this classification is anyone with a growth-oriented worldview. Life enrichment themes and skills are important for establishing the proper motivational context and empowerment of growth in contexts such as higher education, career, family, and personal life. Many of the life enrichment skills require some foundation in the more focused learning skills from the cognitive, social, affective, and psychomotor domains. Research foundations for the classification come mainly from psychological and counseling research that increasingly demonstrates how all skills are motivated and influenced within socially-challenging contexts. Situations present challenges that are well-met by those with a clear sense of performance competence about the real issues that create the standards that must be met.
References


Ecological Leadership

Victor Harms¹ and Cy Leise²

Abstract

Ecological leadership incorporates a systems perspective as a basis for conceptualizing and assessing the integration of leadership performance with organizational priorities. Traditional leadership models referred to as charismatic, positional, and industrial all share an emphasis on top-down or hierarchical power—a characteristic value in times of crisis or for efficiently achieving well-established goals, services, and products. The ecological leader has an advantage when the stability and success of an organization require a focus on effective processes that must be deployed flexibly to maximize effective implementation of the vision. The maximization of all available resources on any given problem or opportunity is one of the primary advantages of the ecological leadership process. This process also embraces the inclusion of any and all people who have specific knowledge, skill, or experience to advance projects or initiatives. For each of the various dimensions of leadership there are tipping points that contribute to decisions by leaders, in full collaboration with stakeholders, to move from the traditional/positional leadership structure and role to an ecological leadership process and role.

Leadership Models and Factors

Followers amass when a leader represents a new vision for governance or goals; they disperse when leaders fail or are perceived to fail in delivering what was expected. Leadership, as a process, can be analyzed in many ways regardless of whether it is viewed in traditional or top-down models, referred to as “positional” and “industrial,” or collaborative, as indicated by newer models called “ecological” or “chaos theory” approaches. Leaders always work within a role structure that requires them to actuate change while maintaining a sense of continuity for meeting the needs of constituents or stakeholders. The ecological model of leadership is of particular interest to process educators because it is based on an open systems perspective with open-loop feedback and no assumption that the leader is important beyond his or her ability to serve the needs of the organization and its stakeholders.

Process educators are dedicated to systems change through the improved quality of processes for learning and growth and the improved quality of collaborative, i.e., ecological, leadership to support these outcomes. The features of leadership, as posited by ecological theory, make possible the creation of an expert profile (Table 1) that will fit varying leadership contexts, e.g., colleges and universities as well as businesses or non-profit organizations.

Reicher, Haslam, and Platow (2007) argue that the psychology of leadership is shifting away from the both the “charisma” theory introduced early in the 20th century and the “contingency model” favored by social psychologists in the 1960s and 1970s. The earlier model puts great emphasis on specific traits that make leaders able to persist through great challenges to save their followers. During World Wars I and II this seemed to characterize world leaders—but there was a dark side as well, as dramatically illustrated by Hitler, Stalin, and other dictators who nearly destroyed civilization.

An ecological model may have limits in terms of helping us understand how national leaders operate but history shows that finding ways to share and sacrifice that are compatible with social identity, e.g., projects and policies during the Great Depression and WWII, will be engaged strongly as ways for the people of a country to come together while meeting a great challenge. When world crises, e.g., from WWI, create immediate and massive contingencies related to distributing food and re-establishing order, the “industrial” model of leadership has merit but may not produce longer-term stability as normality resumes. Historian Margaret MacMillan (2001) describes the idealism and the failures of the famous peace talks at Versailles following WWI. Many of the leaders were strong and committed, but the conditions were too complex for full success, both historically and in terms of emerging nationalism, including that of Bolshevism in Russia. Many serious problems continued to fester throughout the 20th century, even beyond WWII to conflicts of the 21st century in Asia and Africa.

A “contingency” model that emerged after WWII, as articulated by Fred Fiedler and his associates, put the emphasis on the match of the leader with the challenge “context.” Although this match assumption is logical, Reicher et al. report that the research results are “mixed,” and the charismatic and contingency models remain attractive to many. The ecological model incorporates both the contingency and charismatic models by using a systems approach to analyze how leadership emerges and changes in varying situations.

In the 1970s a new theme emerged from group psychology research. Tajfel (e.g., Dumont & Louw, 2009) and Turner

¹² Bellevue University
(1991) theorize that social identity helps to explain the rise of leaders in many of the new nation states that emerged in both the 19th and 20th centuries. These leaders consciously dressed and talked in ways that resonated with their followers; they reciprocally reinforced “in-group” policies championed by other new leaders. Social psychology research has supported this theory in terms of showing that equality, justice, and other values must be demonstrated in the presentation and reality of leadership. Leaders who use their positions to gain excessive wealth or who fail to make sacrifices for their social identity groups will reduce followers’ sense that their leaders are authentic. Leaders cannot claim full responsibility for policies; they must engage followers in a dialogue that clarifies shared social identity so that their visions will be acclaimed. The social identity leadership style has a potential dark side in that “out-groups” tend to be excluded in certain ways because followers deem this to be appropriate.

In the current “electronic age,” businesses such as Google™ have changed the dynamics of how people communicate; these organizations are led by individuals with values and practices consistent with the nature of the new modes of communication that are the basis of their income and influence. Restrictive nations fear the empowerment associated with these new technologies and try to delimit who can login to Facebook, Twitter, and other new platforms that allow messages to go to many thousands or even millions of individuals at once. Leaders of these organizations succeed by using what is basically an ecological model. Researchers for “Project Oxygen” at Google (Bryant, 2011) manually coded qualitative data across many managers and then used careful interviews to validate eight “good behaviors” that appear to be fully compatible with an ecological model. The best managers coach, empower, expect results, and maintain focus on the vision in good times and bad. Low performing managers don’t put priority on communication, don’t assure that new employees are integrated into the culture, and fail to support the professional development of their staff.

**Theory of Ecological Leadership**

More recently, the hybrid, systems model of leadership, referred to as “ecological leadership” (e.g., Wielkiewicz & Stelzner, 2005), has gained adherents because leaders not only must “fit” the challenge and have social identities consistent with their followers, but must actively seek out opportunities to share authority, responsibility, accountability, and resources within an organization. Wielkiewicz and Stelzner presented four features they assume to be central to ecological leadership: (a) tensions always exist due to how traditional leaders handle processes, (b) the context and leadership itself are more important than individual leaders, (c) organizations thrive from many sources of input for decisions, and (d) leadership emerges from interactions between leaders and followers as they mutually engage problems related to a vision.

The basic premise of ecological leadership is that an effective leader will bring many individuals and groups to the forefront because these people have a special potential to help actualize the aspects of a vision. The leader remains as the keeper of the vision and overall direction of the organization by using collaborative strategies. Strong character traits of traditional models remain important because the ecological leader must deal with mistakes and competition, from within or without, by demonstrating both steadfastness and flexibility while sharing authority for how many important processes are implemented.

Ecological leadership, as a theory, has roots in critiques of the “industrial” (also called “positional”) model that has been the norm in Western companies and organizations. Wielkiewicz and Stelzner (2005) emphasize that the processes of leadership used for decisions and actions by industrial/positional leaders do not fully explain what constitutes effective leadership. They argue that, if the longer-term needs of an organization are to be well-served, leadership must be more important than the leaders themselves. Therefore a basic assumption of the ecological model is that leadership involves “floating” processes involving the leader and stakeholders/followers.

By contrast, in traditional industrial and positional leadership models, the emphasis is on the leader as an individual with specific—actually special—traits and abilities. An ecological leader is the keeper of the vision and maintains the overall direction of the organization, but not by possessing unusual traits. The ecological leader seeks to identify those in the organization who have traits and abilities that are strengths for achieving specific goals; the ecological leader negotiates with these individuals to be responsible and accountable, and provides them with necessary resources. Therefore an ecological leader willingly allows various individuals or teams to be independent in leading specific projects. Positional leaders, by contrast, tend to make decisions in a hierarchical manner to align organizational demands with available resources.

Although traditional conceptualizations of leadership remain valuable in certain ways, the interactive features of the ecological models move them closer to an integrated approach. Wielkiewicz and Stelzner (2007) responded to a special issue of the American Psychologist about the theory and research of leadership, arguing that most of the articles supported traditional industrial or positional theories. They concede that, in an article in the special
issue, Hackman and Wageman (2007) asked searching questions: Under what conditions does leadership matter?, How do leaders’ personal attributes interact with situational properties to shape outcomes?, Are the phenomena of good and poor leadership qualitatively different?, and How can leadership models be reframed so that they treat all system members as both leaders and followers?

Wielkiewicz and Stelzner (2007) suggest that the answer to these questions is that the expertise to solve problems is distributed throughout an organization; this means that positional leaders often must decide and act without the benefit of all important perspectives, and this puts the organization at risk if decisions and strategies are wrong for the conditions that emerge. Leadership, in other words, is a work in progress that is shaped by the success of ecological, i.e., collaborative processes at all levels of an organization. They suggest that an integrative solution requires that all leadership models be used when they fit, but the ecological approach is essential for increasing learning from the experience of a constantly changing pattern of mutual collaboration between followers and leaders to achieve the mission and vision of an organization. It might be inferred that stakeholders will recognize the need for a leader’s change to a positional model in a crisis because he or she will have built trust over the longer periods when conditions have been more normal.

**Ecological Leadership Roles**

The situations and problems that can confront a leader are myriad and include much that is unpredictable. A companion theory, chaos process theory, provides an understanding of how to deal with such unpredictability. Realizing that opportunities and risks must be assumed as constants that are only partially knowable, the ecological leader seeks to move the organization forward into new opportunities and prepares it for overcoming obstacles by maximizing the resources, skills, talents, and experiences of the entire organization. A key concept of chaos process theory is that there is functionality in everything that anybody does; the goal is to identify the potentially positive outcomes that each function has as its goal and to actualize these positive potentials. An ecological leader looks for ways that those undesired and indirect outcomes can be utilized in some form of productive action.

Lindborg (2007) recommends that the change processes in higher education require close attention to conscious, collective collaborations that will support both processes and outcomes. The change process must help all stakeholders stay on the path of change until all the phases of accomplishment and integration are achieved. Mecca (2007) argues that the change process must take into account the personal changes that participants need to make if the change is to be integrated into the life of the organization. Change sponsors must move the responsibilities to many other stakeholders—consistent with ecological leadership principles—so that the change is promoted throughout the organization.

There are four common functions that are utilized by an ecological leader: counseling, mentoring, consulting, and coaching.

- Counseling, which is based on a medical model, involves the identification or diagnosis of problems that are impeding normal life and the finding of solutions to these problems.
- Mentoring, which is based on an experiential model, seeks to provide the benefit of previous learning to an individual or to groups of individuals.
- Consulting, which is based on the expert model, seeks to produce benefits for an outside organization by facilitating the application of specific knowledge or skills.
- Coaching, which is based on a performance model, seeks to help individuals and organizations identify and accomplish desired future accomplishments.

The ecological leader utilizes each of these four roles in strategies that will enable individuals as well as the organization to overcome obstacles and to maximize opportunities. Individuals, teams, and organizations need to be able to use the processes associated with these four roles. Ecological leaders are able to identify the process that is needed at the time for the specific issue and are then able to connect the needed process between the “expert” provider and the recipient that is in need of the specific process.

**Profile of an Ecological Leader**

Based on the theory of ecological leadership, Table 1 is a presentation of the main processes that a skillful transformational leader should exhibit for each of the identified performance areas.

**Tipping points in Leadership**

Ecological leaders whose practices match those described in the Profile of an Ecological Leader (Table 1) seek to maximize organizational effectiveness and to create opportunities for leveraging individual strengths, experiences, abilities, and resources. A key milestone of ecological leadership is the creation of a culture that includes creative communication for how and when individual resources can be used for mutual benefit. Hadley (2007) recommends careful attention to avoid language that can discourage participants from committing
<table>
<thead>
<tr>
<th>Performance Area</th>
<th>Leader Behavior</th>
</tr>
</thead>
</table>
| **Vision**       | Clearly articulates the mission and vision  
|                  | Creates robust processes to support the vision  
|                  | Balances internal and external concerns and challenges  
|                  | Balances short- and long-term initiatives and risks  
|                  | Identifies “tipping points” for envisioned strategies |
| **Resource Management** | Inventories talent for multiple role and task potential  
|                  | Leverages talent to produce important outcomes efficiently  
|                  | Continually assesses boundary conflicts  
|                  | Values strengths and loyalty  
|                  | Motivates the positive growth of teams at all levels  
|                  | Initiates broadly applicable innovations and champions these improvements by serving as an effective change agent |
| **Administration** | Uses talent inventory knowledge to create effective work units  
|                  | Delegates work appropriately, and holds people accountable for their contributions to goals  
|                  | Prioritizes functions within the organization  
|                  | Motivates departmental and institutional development by creating opportunities for growth |
| **Balance of Responsibility & Authority** | Facilitates to achieve mutuality in all substantive decisions and assignments  
|                  | Assembles in-depth input from all levels of the organization  
|                  | Establishes clear standards of accountability at all levels  
|                  | Accepts failure for realistic reasons  
|                  | Clearly understands the expected outcomes and remains focused on them  
|                  | Addresses the specific needs of responsible units and individuals  
|                  | Identifies and promptly takes action to solve problems that impede the growth or progress towards the expected outcomes |
| **Consciousness of Organizational Culture** | Articulates organizational culture for all to assess  
|                  | Collaborates to set criteria for organizational culture  
|                  | Leads celebrations of successful endeavors |
| **Communication Facilitation** | Establishes patterns of communication related to participation in the vision  
|                  | Facilitates communication to identify how to integrate the system  
|                  | Keeps communication transparent across units and individuals |
| **Role Modeling** | Collaborates to set achievable and believable goals  
|                  | Models authenticity and integrity in times of stress  
|                  | Shares benefits from organizational accomplishments  
|                  | Displays charisma to build confidence internally and externally  
|                  | Grooms future leaders |
| **Mentoring** | Challenges mentees to define their own learning objectives, performance expectations, and action plans so that they can realize their personal and professional development outcomes  
|                  | Consistently models the behaviors and values of his or her own discipline  
<p>|                  | Employs timely, effective interventions related to learning skills that stimulate growth in mentee performance |</p>
<table>
<thead>
<tr>
<th>Performance Area</th>
<th>Leader Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establishing a Learning Organization</td>
<td>Establishes reliable and valid measurement of processes and of quality of outcomes</td>
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<tr>
<td></td>
<td>Uses both qualitative and quantitative methods to test hypotheses related to predictions about envisioned processes and outcomes</td>
</tr>
<tr>
<td></td>
<td>Efficiently and effectively communicates findings from research activities in multiple modes to advance a community of understanding among all stakeholders</td>
</tr>
<tr>
<td></td>
<td>Establishes a “learning organization” that continually leverages information and data</td>
</tr>
<tr>
<td></td>
<td>Supports an integrated system by analyzing for outcomes that are essential to the success of the organization’s vision, culture, and talents</td>
</tr>
</tbody>
</table>

| Professionalism in the Discipline      | Is an expert practitioner in his or her discipline, as well as a scholar in the discipline of teaching/learning |
|                                        | Has strong learning skills and continually strives to increase his or her knowledge and skills within his or her discipline |
|                                        | Develops a network within and outside his or her discipline by building personal relationships with key individuals in the local, national, and international communities |

| Assessment                              | Is strongly growth oriented and practices assessment with a non-judgmental mindset |
|                                        | Observes and analyzes performance in real-time and makes interpretations that are insightful to others |
|                                        | Remains focused on the specific assessment criteria that are aligned with the purpose of the assessment |
|                                        | Publicly shares self-and other assessments/evaluations of leadership strengths, areas of improvement, and insights for future change |

The arguments for change from a positional to an ecological model of leadership are supported by theory and research, but the practice guidelines for transforming leadership of an organization from a traditional model to an ecological model remain unclear. Gladwell (2002) popularized the concept of “tipping points” to illustrate how social change evolves until a certain set of circumstances or state of acceptance occurs to move society as a whole to a new equilibrium. It is hypothesized here that leadership processes are likely to change only when important events, which can be positive as well as negative for an organization, force movement to a more effective model. As chaos theory explains, these events have an element of unpredictability, and there are also risks to making changes in leadership style that cannot be understood before they are made. Ecological leadership theory has the distinct benefit of putting the benefits and risks into an orderly model that includes effective processes for continuous change of all roles in an organization.

Table 2 is based on criteria that are relevant to all types of leadership (e.g., Riggio, 2008). A key issue with transforming leadership of an organization is that change will not occur without motivating conditions. Leadership, as exhibited by any individual leader, will vary across the criteria on a continuum of behaviors and characteristics defined in the left column for traditional/positional to those in the right column for ecological/transformational. The types of “tipping point” events that are inferred to be likely as motivators for the shift from traditional to ecological are presented in the middle column.

Application Examples

An example of these principles being applied would be that of a community college engaging in the process of a transformational way of being. In response to external stressors and opportunities, which are combined with external opportunities and new internal ways of being, the organization as a whole moves forward in new ways and in new ways of performing its primary functions. The shift is initiated by leadership that “sees” current
Table 2: Continuum of Leadership

<table>
<thead>
<tr>
<th>TRADITIONAL/ POSITIONAL</th>
<th>TIPPING POINTS</th>
<th>ECOLOGICAL/ TRANSFORMATIONAL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vision</strong></td>
<td><strong>Definition:</strong> The long-term ability to plan and pursue a clear future organizational state</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Board/Admin Orientation</td>
<td>Completion of an existing strategic plan or change in top leadership</td>
<td>Integrated System of Commitment to Mission</td>
</tr>
<tr>
<td><strong>Challenge Example</strong></td>
<td>This may occur when there is a significant negative shift in the primary market within which the organization functions.</td>
<td></td>
</tr>
<tr>
<td><strong>Opportunity Example</strong></td>
<td>Upon the completion of a significant growth phase or at the end of a strategic plan implementation, the leadership vision is what can create the “next” significant phase.</td>
<td></td>
</tr>
<tr>
<td><strong>Shareholder Buy-In</strong></td>
<td><strong>Definition:</strong> The lasting commitment of contributing organizational members</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Secondary to Administrative Control</td>
<td>Failed business plan or fragmentation of organizational effort</td>
</tr>
<tr>
<td><strong>Challenge Example</strong></td>
<td>Personal or individual agendas diverge resulting in organizational tension and lack of focused shareholder commitment.</td>
<td></td>
</tr>
<tr>
<td><strong>Opportunity Example</strong></td>
<td>Organic alignment of the dedication of individuals is centered around mutually beneficial outcomes.</td>
<td></td>
</tr>
<tr>
<td><strong>Utilization of Authority</strong></td>
<td><strong>Definition:</strong> How the leader and the organization at large use power</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Top-down Management of all Processes</td>
<td>Significant growth or compelling external challenge</td>
</tr>
<tr>
<td><strong>Challenge Example</strong></td>
<td>An unforeseen setback requires greater leverage of power than any single individual possess.</td>
<td></td>
</tr>
<tr>
<td><strong>Opportunity Example</strong></td>
<td>There is sharing or co-formulation of new power alignments to create new individual/organizational authority structures.</td>
<td></td>
</tr>
<tr>
<td><strong>Challenge Focus</strong></td>
<td><strong>Definition:</strong> Ongoing improvement and organizational development</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fulfill Current Expectations and Policies; Deal with Crises</td>
<td>Marginalization of Market Position or Key Functional Failure</td>
</tr>
<tr>
<td><strong>Challenge Example</strong></td>
<td>Essential organizational functions either lose effectiveness or become irrelevant.</td>
<td></td>
</tr>
<tr>
<td><strong>Opportunity Example</strong></td>
<td>New or different opportunities present that require a renovation of how the organization performs primary or essential functions.</td>
<td></td>
</tr>
<tr>
<td><strong>Communication Facilitation</strong></td>
<td><strong>Definition:</strong> Open organic free flow of candid and genuine information</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inform All Stakeholders about Decisions and Staff Structure</td>
<td>Loss of focus and efficiency that results in wasted energy and resources</td>
</tr>
<tr>
<td><strong>Challenge Example</strong></td>
<td>Hidden or personal agendas become a block that conflicts with organizational operations.</td>
<td></td>
</tr>
<tr>
<td><strong>Opportunity Example</strong></td>
<td>Individual character and integrity formulation leads to deeper and more transparent direct communication channels.</td>
<td></td>
</tr>
</tbody>
</table>
### Process Efficiency
**Definition:** *Formal and informal structures that are both stable and flexible as needed*

<table>
<thead>
<tr>
<th>Hiring to Address New Needs or Processes</th>
<th>Inability to hire additional needed people</th>
<th>Continual Re-Integration of Roles and Structures to Maximize Efficiency</th>
</tr>
</thead>
</table>

**Challenge Example**
Historical organizational structures impede the maximization of newly discovered opportunities.

**Opportunity Example**
The creation of new ways of doing business results in a new way of being for the entire organization.

### Responsibility
**Definition:** *Ownership of decisions and duties balanced on all levels*

<table>
<thead>
<tr>
<th>Administrators Decide Who Is Responsible</th>
<th>Organizational reaction to the scape-goat process</th>
<th>Mutual Decisions about Responsibilities</th>
</tr>
</thead>
</table>

**Challenge Example**
Historical precedent of leadership defaulting responsibility by placing individual blame on various institutional members

**Opportunity Example**
Emerging culture built upon new organizational ventures create a prediction of individual and team responsibility in possible failure and acknowledgement in potential success.

### Accountability
**Definition:** *Members and leaders equally own consequences of decisions and actions*

<table>
<thead>
<tr>
<th>Administrators Decide Who Is Accountable</th>
<th>Ineffectiveness reaches critical mass</th>
<th>Each Person or Unit Agrees to be Accountable in Mutually-Defined Areas</th>
</tr>
</thead>
</table>

**Challenge Example**
The organization loses momentum leading to the necessity of overall organizational restricting.

**Opportunity Example**
Leadership takes the position of placing them as being accountable to the stakeholders and forms new accountability contexts.

### Future Growth Focus
**Definition:** *Current success viewed as foundational for new opportunities*

<table>
<thead>
<tr>
<th>Mandated or Incented by Leadership</th>
<th>Required tasks reach magnitude that exceeds mandates or incentives</th>
<th>Internal and Persona Motivation as a Way of Being</th>
</tr>
</thead>
</table>

**Challenge Example**
The need for future movement is exceeded by external motivational resources.

**Opportunity Example**
Leadership creates a new focus of opportunity either in the improvement of existing opportunities or in the identification of newly discovered potential ventures.
directions and looks for new opportunities. Once the new direction has been established, the leadership empowers the shareholders to create new processes that build the collaborative functioning of all aspects of the community college organization. There are clear decision-making processes in place that allow for shared authority and accountability.

Another example could be an effective organization that is nearing the completion of its most recent strategic plan. The leadership can embark on a strategic planning process geared for the restructuring of a “siloed” university. Various entities such as administration, staff, and faculty are able to “give up” their “ownership” of each specific area and rethink the alignment of the overall organization in order to create multi-entity buy-in for a new long-term strategy.

In both of the brief examples there are several points to remember. First, it is difficult to mandate ecological functioning; rather the influence of leadership is one of creating an environment that nurtures. Second, transformational leadership begins with leadership and then radiates outward to the entire organization.

**Conclusion**

The tradition of positional top-down leadership has several shortcomings. It is difficult to expect that any one individual would possess all the necessary skills, knowledge, and ability needed in our current global climate. It is also unreasonable to require any one individual to be equipped to effectively lead an entire organization in areas that are outside of the scope of the individual leader’s expertise.

An increasingly complex world combined with an ever-rapidly changing marketplace taxes available resources to the breaking point. Gone are the days of large profit margins and significant margins for error. In a global economy with international competition, each and every resource must be leveraged in a successful organization. Complex organizations must not rely on any one single leader, but rather a leadership team of empowered individuals led by an equally empowered leader.

One of the primary leadership responsibilities is to create a collaborative environment that communicates, empowers, and adapts to each challenge and opportunity along the life cycle of the organization.

A change in the attitude of the leadership as well as the members of the organization is required to maximize individual effectiveness as well as to maximize organizational potency. When leaders and individual organizational members pool their resources, the result is efficiency and increased effectiveness. The willingness of the positional/traditional leader to engage in ecological leadership is the key starting point. The empowerment of the individual member is a key second aspect of ecological leadership. The actual culture of the organization is the third core trait of an effective organization that employs ecological leadership.

**References**


A Methodology for Team Teaching with Field Experts

Yaomin Dong¹, Jacqueline El-Sayed², and Mohamed El-Sayed³

Abstract

To achieve program and course educational objectives and outcomes in a professional degree program, field experience and familiarity with current practices are usually needed, especially in upper level courses. One way of bringing these field experiences and practices into the classroom is for faculty to partner with experts in the field. The advantages to the students, the faculty, and even the collaborating experts are numerous. To ease the development of this type of experiential learning, a methodology for such collaboration is needed. This paper provides a template for a team taught course in which university faculty partner with practicing experts. A methodology is developed that includes guidelines, activities, and recommended practices. This methodology can be used by faculty to more easily integrate field practice into their classrooms. To illustrate the use of the developed methodology, a case study of a team taught course with field experts is provided.

Introduction

The design of course activities for upper level courses in some of the professional degree programs may require the inclusion of current practices in the field. For such classes, the interdisciplinary nature of these practices and the rapid change in the professional practices may demand input from not only an interdisciplinary team of faculty but also some current field experts. Bringing the workplace practices of field experts to the classroom in order to grow students’ skills and knowledge of current practices may be essential for achieving program outcomes and educational objectives.

To address the need for implementing current practices and interdisciplinary participation, one of the common practices is to invite experts from the field or from other disciplines to serve as guest speakers for certain topics. However, the full potential of this type of participation is not usually realized. To provide a true experience that prompts students to construct their own knowledge and develop their skills, field experts and faculty from other disciplines should participate as team members in the design of activities and in course delivery. This team teaching approach can also be utilized to provide modeling of characteristics, attitudes, and ways of being such as teamwork and collaboration in academic programs. True team teaching, however, requires more effort in planning and careful synchronization in delivery in comparison to courses taught in the traditional manner. Adding external field experts to the team requires much more attention to planning and synchronization.

In this paper, a team teaching approach that includes field experts is discussed to develop an understanding of the issues involved and recommended practices. This approach was motivated by a previous study (El-Sayed, J., El-Sayed, M., & Beyerlein, 2010) which found a perception among alumni that classroom learning did not contribute to a large increase in one’s ability as a “Collaborator,” one of the interpersonal roles of the Engineering Expert Profile (Davis, Beyerlein, & Davis, 2006). As a pilot academic intervention, the style of team teaching presented in this paper was utilized to provide a means to model the collaboration of engineers in both academic and industrial tracked careers. Increasing skill in this role was assessed using a published rubric for teamwork (Rogers, 2011).

Team Teaching Models

Team teaching is a method of coordinated classroom instruction involving a number of educators working together with a single group of students. This method has been around for years and is a strategy used at different levels in many schools. A strong team brings a variety of different teaching styles and expertise to the learning experience.

One of the models for team teaching is to have faculty raise comments from the floor during presentations. Lindauer (1990) chose to formalize faculty interaction by employing a discussant format in which each faculty member was given ten minutes to speak at the end of the other’s lecture. The advantages of the discussant format have proven to be numerous and have addressed matters of both form and substance. Relative to more ad hoc team teaching approaches, the discussant format encouraged faculty to prioritize comments and limit the pursuit of tangential issues. The format also proved valuable in reviving students’ interest toward the end of class sessions. Changing faculty members an hour into the lecture was found to revitalize the class, enabling key points to be conveyed more effectively. Because discussant comments are prepared during the lecture instead of beforehand, they possess a dynamic quality.

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Personal chemistry between the team members is arguably one of the most important factors for success. (Robinson & Schaible, 1995) suggested that the optimum team size is two members. The complexity of a team size beyond this inhibits good collaboration. The teammates should agree from the start that the first time teaching together is a trial run and that there should be no hard feelings if the chemistry isn’t right.

A case study in which three professors decided to integrate their teaching, combining the content of three separate courses into one period of time, is documented by (Bakken, Clark, & Thompson, 1998). This work provided an example of integrated curricula for team members coming from different disciplines. They used several collaborative or cooperative teaching approaches. First, each member taught the materials relating to his or her specific discipline. Second, two or three members led the discussions and presented information together. From time to time, when one of the members was presenting, another would join in to clarify or add an additional view.

Gray and Halbert (1998) proposed an approach called “teaching with a student,” in which the professor in charge of course design shares the daily delivery and delegates most of the administrative duties to the “student teacher.” This model is less expensive, involves less conflict, conserves faculty time, and leads to a more student-centered classroom.

Advantages of Team Teaching

To determine the effectiveness of instruction, El-Sayed, J. (2007) rates the effects of several different team teaching models on course delivery, including interactive course dialogue, transitions/integration, and efficient use of faculty time. From the literature, the advantages of team teaching include the following:

- Courses can more accurately reflect workplace challenges
- Courses can be interdisciplinary by engaging professors with unique expertise
- Students are able to see the professors interact in the classroom. Such an interaction constantly leads to new insights about the disciplines involved, because each professor models the behavior of an individual from his or her discipline.
- During the problem-solving process, it is beneficial for students to see the professors as learners as well as teachers, and to demonstrate that learning is a lifelong endeavor.
- The level of classroom discussion and interaction is improved. This interaction is beneficial for students who might have trouble articulating their questions or who may lack the confidence to question the professor who is the expert.
- Students have the opportunity to see that faculty members from different disciplinary areas and departments really do have consistent educational and intellectual goals.
- It is beneficial and refreshing for students to see different teaching styles in the same classroom, and helps them develop their own methods for their reports and presentations.
- Students have good models of teamwork when they see professors working together through collaborative teaching.
- Working with new people and learning more about other disciplines is very stimulating for both the faculty members and students, and their enthusiasm makes the classes more interesting.
- Team teaching gets faculty members into other places to better acquaint them with colleagues with whom they often have little contact.
- It is beneficial for industries to have many different solutions to their problems at very low or even no cost. Very often the students look at the projects from very fresh perspectives, which might lead to innovative solutions.
- Industries can find future recruits through this kind of interaction with students; and students also have the opportunity to find a fit for their interests in the future.
- Interacting with others in academic environments gives industrial experts a chance to have a respite from the normal day-to-day work pattern.
- Industrial experts are provided with the philanthropic opportunity to leave a legacy to the next generation.

Challenges for Team Teaching

Certainly there are several challenges in team teaching. Types of challenges will depend on the field of study, the institution at which the course is being taught, the nature of the course, and the team of faculty involved. Some of these challenges can be summarized as follows:

- It is expensive to pay more than one professor to teach one class.
- It would be difficult for all parties involved if the professors weren’t compatible, and faculty should never be forced into something like team teaching.
- Students might be confused when they don’t know
which professor to address in asking specific questions
- Class projects will be more “on the fly” instead of thoroughly prefabricated
- The class schedules of the universities may be very different from that of the current product development/launch in the companies. Therefore the conflict of priorities in educational institutes and industrial companies will have to be resolved and agreed upon.

Steps for Team Teaching with Field Experts
Following Smith (2007), the methodology for team teaching can be summarized in the steps shown in Table 1:

<table>
<thead>
<tr>
<th>Step</th>
<th>Action to be Taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Define activities outcomes</td>
</tr>
<tr>
<td>2</td>
<td>Choose topic/theme</td>
</tr>
<tr>
<td>3</td>
<td>Choose teaching team</td>
</tr>
<tr>
<td>4</td>
<td>Choose field expert partners</td>
</tr>
<tr>
<td>5</td>
<td>Outline matching/mapped activities</td>
</tr>
<tr>
<td>6</td>
<td>Provide field trip for immersion learning at industrial site</td>
</tr>
<tr>
<td>7</td>
<td>Design assessments</td>
</tr>
<tr>
<td>8</td>
<td>Timeline for development</td>
</tr>
</tbody>
</table>

Guidelines for Guest Lectures
Guest lectures given by experts from the field are largely unknown within academia and in the mindsets of students. In this situation the professor is the educational expert and must be the facilitator. The professor must share with the guest lecturer how to best interact with students and what level of content is needed for each class period. Most guest lecturers will greatly appreciate this guidance; often guest lecturers have limited time but greatly look forward to the opportunity to contribute. To facilitate and maximize guest lecturers’ contributions, professors should consider the following guidelines:

- Provide a time estimate and orientation for guest lecturers - be a coach
- Attend all class sessions with guest lecturers
- Help the experts to understand how your students learn best
- Be approachable and seek regular feedback from students
- Communicate the background and experience of the students

Additional Active Learning Activities
To enhance the learning experience, some additional active learning activities can contribute to student learning. For example, activities that work well, due to the spontaneous nature of these types of courses, are those that allow students to participate in the preparation, presentation, or grading. Students can take ownership of their learning and often have ideas that provide superior knowledge construction. Following is a list of possible additional activities:

- Written briefs on topics or pre-reading
- Presentations on research papers
- Asking students to write quiz questions based upon guest lecturers’ topics
- Having students set the performance criteria and expectations for grading
- Having students market their projects

Check List for Team Teaching with Field Experts
The following is a recommended checklist of discussion items. These items should be discussed before the team teaching itself begins so that the team will be more efficient right from the start. Some of these items are straightforward; other items will require some time for instructors new to this methodology to build sufficient experience.

- Scope?
- IT requirements?
- Approval timeline?
- Able to get information in a timely manner?
- Confidentiality?
- Backgrounds of the students in class/appropriate challenge?
- Materials, books, supplies?
- Role assignments?
- Who provides what, how to get it?
- Who should teach what?
- What content should be taught separately?
- What content should be taught jointly?
- How will we grade the students’ work?
- Who grades which papers?
- What grading system?
Case Study – Engineering Team Teaching with Field Experts

In this case study, a senior-level engineering course entitled the “Mechanical Properties of Polymers” is used as an example to demonstrate the application of the outlined methodology of team teaching with field experts. In this example, team teaching is focused on students’ term projects that deal with the redesign of an automotive engine cam cover. The implementation of the previously outlined steps of team teaching with field experts could be summarized as follows:

**STEP 1 Define activity outcomes**

Hanson (2007) provides a great guide for defining, designing, and aligning the activities with course outcomes. For this course the activity outcomes included the following:

1. Improve problem-solving skills in real-life projects
2. Apply knowledge learned on engineering materials
3. Reduce cost in manufacturing and materials
4. Reduce mass of products
5. Apply skills in computer-aided engineering (CAE)
6. Develop environmentally friendly products

**STEP 2 Choose the topic/theme**

In this case study, the topic chosen was that of expanding the use of plastic. The application field for this theme was that of automotive components, following the motivation discussed by Gerard (2008) and Abuelsamid (2008) for transitioning power train components from metallic to plastic materials.

With input from the industrial partners, a new design of a plastic cam cover was selected as the class project. Supervised jointly by the faculty members and the external industrial experts, different student teams performed their own project design and development. To complete the class project, each team had to carry out the following tasks:

1. Choose the desired materials
2. Understand the engineering specifications of the product
3. Understand the functional requirements of the product
4. Determine the deformation and compare the materials

**STEP 3 Choose a teaching team**

For this course, two faculty members teamed up to cover materials and engineering analysis. The team teaching experience covered topics related to plastic material properties and behaviors, along with computer simulations and analysis of engineered components. One faculty member focused on subject knowledge while the other focused on problem-solving skills. The full teaching team was composed of four members: two internal faculty members and two external experts. One external expert was a field engineer from Table 2: Template of Team Teaching Course Outline

<table>
<thead>
<tr>
<th>Week</th>
<th>First class period</th>
<th>Second class period</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to class with professor(s) /Selection of project teams</td>
<td>Overview of industrial process with expert(s)/presentation of project</td>
</tr>
<tr>
<td>2</td>
<td>Lecture 1, Assignment 1</td>
<td>Lecture 2, Assignment 2</td>
</tr>
<tr>
<td>3</td>
<td>Guest lecture- Topic 1</td>
<td>Progress report/presentation on projects</td>
</tr>
<tr>
<td>4</td>
<td>Lecture 3, Assignment 3</td>
<td>Lecture 4, Assignment 4</td>
</tr>
<tr>
<td>5</td>
<td>Lecture 5, Assignment 5</td>
<td>Assessment/Exam 1</td>
</tr>
<tr>
<td>6</td>
<td>Guest lecture- Topic 2</td>
<td>Lecture 6, Assignment 6</td>
</tr>
<tr>
<td>7</td>
<td>Lecture 7, Assignment 7</td>
<td>Lecture 8, Assignment 8</td>
</tr>
<tr>
<td>8</td>
<td>Lecture 9, Assignment 9</td>
<td>Progress report/Presentation on projects</td>
</tr>
<tr>
<td>9</td>
<td>Field trip to industrial site, Written reflection</td>
<td>Lecture 10, Assignment 10, Continue to work on project</td>
</tr>
<tr>
<td>10</td>
<td>Lecture 8, Assignment 8</td>
<td>Assessment/Exam 2</td>
</tr>
<tr>
<td>11-14</td>
<td>Lecture 9, Assignment 9, Project</td>
<td>Lecture 10, Assignment 10, Project</td>
</tr>
<tr>
<td></td>
<td>Final week Final presentation with experts</td>
<td>Final exam</td>
</tr>
</tbody>
</table>
the automotive OEM and the other was a material supplier working with the OEM. This teaching team covered all of the interdisciplinary expertise needed for the course.

**STEP 4  Choose field expert partners**

The two external experts were chosen based on the requirements of the project. One was an expert in product development and application, and the other was a material guru. They had been working together on their projects with great success. Such partnership provided seamless connection and guaranteed a smooth delivery of knowledge to the students.

**STEP 5  Outline matching/mapped activities**

1. The faculty member whose responsibility it was to teach subject knowledge lectured on the fundamentals of material properties during the first module of the course.

2. The term project was then assigned. This was the point at which the whole teaching team became involved.

3. The OEM engineer presented the background information on the product. The team then toured the OEM facility with the class to gain an understanding of the principles and requirements of the product.

4. The material engineer introduced the candidate materials for the product redesign and all of the lessons learned in the field.

5. The faculty member who was responsible for teaching skill development started work with the students on design, modeling, and data interpretation.

Table 2 shows the template of the team teaching course outline, in which the weekly topics are tabulated. This template may be modified to suit the instructor’s course and type of project. It is best geared for use in courses beyond the freshman year when the students have enough background for more sophisticated team projects.

**STEP 6  Provide a field trip for immersion learning at an industrial site**

Several field trips were arranged. First, the teaching team members met at the university to discuss the curriculum and course layout; they agreed on the course learning objectives and outcomes. Then they toured the R&D centers and laboratories of the OEMs and material suppliers. These tours and visits provided great opportunities for the faculty members to better understand the products, and for external experts to better understand the course outlines and the classroom experience.

**STEP 7  Design assessments**

The course project was designed jointly by the four members of the teaching team. The scope of the project incorporated the typical product development procedures in industry, i.e., functional analysis, specifications, concept development, design review, and validation.

**STEP 8  Timeline for development**

The timeline for development considered the university academic calendar and external experts’ schedules and availabilities.

**Guest Lecturers**

An OEM power train specialist was invited to give a lecture on the cam cover design introduction. The design process of a typical power train component was presented by the industrial expert, including the engineering specifications and goals for mass and cost reduction.

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**Table 3: Key Performance Indicator Rubric (Adapted from Rogers, 2011)**

<table>
<thead>
<tr>
<th>Key Performance Indicator</th>
<th>Beginning</th>
<th>Developing</th>
<th>Accomplished</th>
<th>Exemplary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listens to Other Teammates</td>
<td>Is always talking-never listens or allows anyone else to speak</td>
<td>Usually doing most of the talking-rarely allows others to speak</td>
<td>Listens but sometimes talks too much</td>
<td>Listens and speaks a fair amount</td>
</tr>
<tr>
<td>Fulfills Team Roles/Duties</td>
<td>Does not perform any duties of assigned team role</td>
<td>Performs very few duties</td>
<td>Performs nearly all duties</td>
<td>Performs all duties of assigned team role</td>
</tr>
<tr>
<td>Cooperates with Teammates</td>
<td>Usually argues with teammates</td>
<td>Sometimes argues</td>
<td>Rarely argues</td>
<td>Never argues with teammates</td>
</tr>
</tbody>
</table>
After the OEM engineer lecture, some material suppliers and plastics industrial advisory board members were also invited to teach the material engineering and applications.

Course Delivery

During course delivery, students were divided into project teams and began the material selection and analysis:

**Material Selection** — Through research on common plastics used in automotive applications, four different materials were selected for analysis. These materials were selected for their desired properties.

**Analysis** — Engineering simulations were performed by the teams of students on the cam cover for each selected material. The materials were evaluated based on specified design criteria. Based on the analysis results, one plastic material was chosen for this application (Peabody & Valdivia, 2008).

Course Assessment

In this case study, to measure the technical role of “Collaborator,” in order to assess the intervention toward the program objectives based upon the Engineering Expert Profile (Davis, Beyerlein, & Davis, 2006), the assessment method of direct observation was used. Three key performance indicators were selected from the list of attributes published in the literature. These attributes were: 1) respecting individuals with diverse backgrounds, perspectives, and skills important to the effort; 2) valuing roles, accepting role assignments, and supporting others in their roles; and 3) contributing to the effective cooperation of the team in its development of consensus goals and procedures. These attributes were mapped to corresponding rows in an analytical teamwork rubric (Rogers, 2011). The adapted modified rubric is shown in Table 3:

Based on direct observation of the students, over three-quarters of the class measured “Exemplary” in all three key performance indicators selected for the technical role of “Collaborator.” The other one-quarter of the class measured as “Exemplary” in two key performance indicators, and “Accomplished” in one. When comparing this to the program target of all graduating students measuring “Accomplished,” this signifies that pedagogical interventions such as team teaching with field experts can indeed enhance movement toward achieving program objectives, and may also increase students’ enthusiasm and engagement.

Conclusions

A team teaching methodology to bring field experts into the classroom is proposed. To facilitate the development of this type of collaborative learning, a template for such team teaching is provided. Using this template, the methodology includes best practices, guidelines, and activities to guide faculty to more easily integrate field practices into their classrooms.

To illustrate the use of the presented methodology, a case study of an engineering course partnership between industrial experts and a team of faculty is provided. The collaborative course teaching approach stimulated critical thinking and teamwork between faculty, field engineers, and students. The direct course assessment, included in the case study, demonstrated that pedagogical interventions such as team teaching with field experts can indeed enhance movement toward achieving program objectives, and may also increase students’ enthusiasm and engagement.

Working with projects that are based on field experience creates challenges; however, the rewards in students’ learning are worth the extra effort. Having clear mutual expectations and effective communication are keys to success. Based on the lessons learned in facing these challenges, the following recommendations are provided:

- Underestimate the time requirements
- There will always be “fires,” so plan for them
- Keep open communication; when in doubt ask for verification
- Remember that the frustrations encountered by students are not unlike situations that they will encounter in field practices. Do not underestimate the value of this learning.
- Remain positive and do your best; some things will work and some will not
- Make the development of the team a top priority. Don’t just assume that the team will work well together.
- Set clear goals for the team that all members agree upon, and then ensure that the team’s actions lead to those goals
- Communicate clearly and honestly to survive and grow stronger from conflict
- Honor individual and team successes through administrative support
- Assume responsibility for assigned roles
- Be prepared for team discussions and work
References


Faculty Efficacy in Creating Productive Learning Environments: Universal Design and the Lens of Students with Disabilities

Tristan T. Utschig 1, Nathan W. Moon 2, Robert L. Todd 3, Aaron Bozzorg 4

Abstract

We present findings from the SciTrain University project, particularly as it relates to faculty development efforts. SciTrain University is a program sponsored by the U.S. Department of Education to improve the accessibility of science, technology, engineering, and mathematics (STEM) education for students with disabilities. In this case study we investigate two broad research questions. First, what do participants learn about creating productive learning environments for all students, including disabled learners, as a result of program participation? Second, what actions have been elicited among various stakeholders toward improving the classroom learning environment, particularly for students with disabilities? In this paper we highlight some of the main features of SciTrain University including workshops and web modules for faculty development. We then introduce the project assessment and evaluation process. Next, we discuss the impact this project has produced for a set of 15 faculty participants. Impacts include transferring ownership of the learning process to students through several classroom activities such as group note taking; creating a greater sense of community through enhanced online communication tools such as forums; and expanding assessment of student learning into the classroom using multiple modes of learning within a class period. Finally, we discuss the potential broader impacts of the SciTrain University project.

Introduction

All students, including those with disabilities, should have equal access to and benefit from postsecondary education. Over 10% of the school-aged population includes students with disabilities. However, this figure decreases as students transition from high school into university education. An even smaller proportion of these students are enrolled as science, technology, engineering, and mathematics (STEM) majors. The numbers become more troubling when one considers that graduation rates for undergraduates run at about half the enrollment rates, and rates for graduate school are much lower.

Part of the problem involves professors and faculty advisors who are unable or unprepared to recognize the problems faced by students with disabilities. They are unaware of the accommodations needed by these students, as well as strategies or technologies available to help STEM students with disabilities. In addition, students with disabilities, including those with learning disabilities, often encounter negative attitudes and perceptions from faculty and other students. In many cases, these students are discouraged from majoring in STEM courses of study, and those who persist are often not taken seriously in their efforts as learners.

In order to address these issues, the U.S. Department of Education’s Office of Postsecondary Education (OPSE) has sponsored a number of projects to ensure that students with disabilities receive a quality higher education. One of these projects is SciTrain University, a collaborative effort between the Center for Assistive Technology and Environmental Access at the Center for the Enhancement of Teaching and Learning at the Georgia Institute of Technology, and the Disability Resource Center at the University of Georgia. SciTrain University is designed as a multi-faceted program to enhance the capacities of STEM instructors at the university level and to create a more effective learning environment.

SciTrain University is based around a combination of in-person workshops and web-based training modules for postsecondary STEM faculty, aimed at helping them understand issues of accessibility and the accommodation needs of students with disabilities. In addition to addressing access problems faced by students with disabilities, these resources train teachers to generate their own ideas and solutions for accommodations, with the desired result being improved STEM education for students.

The model for change adopted by the SciTrain University project is consistent with Rogers’ diffusion of innovation (2003). This model is described specifically in terms of faculty development both by Bergquist and by Kuhlenschmidt in Gillespie and Robertson’s A Guide to Faculty Development (2010). In this model the project researchers serve as “innovators/explorers.” The project then targets a group of early adopters or “champions” who have displayed an interest in the program. These faculty then participate in the project-sponsored workshops and agree to review materials and/or to participate in a longitudinal study during a period of time in which they work to implement various innovations in their classrooms. It is hoped that

1, 2, 3, 4 Georgia Institute of Technology
the lessons learned from this group (along with the successes they have in adopting various innovations introduced at the workshops) will diffuse to the early majority as they realize the benefits that can be gained with a reasonable implementation effort.

In this paper we present findings from SciTrain University’s work with faculty in these developmental efforts to address the needs of students with disabilities. The results of this case study address two broad research questions. First, what do participants learn about creating productive learning environments for all students, including disabled learners, as a result of program participation? Second, what actions have been elicited among various stakeholders toward improving the classroom learning environment, particularly for students with disabilities?

Below, we outline the problem addressed by the SciTrain University through a brief literature review. We then highlight some of the main features of SciTrain University, including workshops and web course-modules for faculty development. Next, we discuss the impact this project has produced for a set of 15 faculty participants. Finally, we conclude with a brief discussion of the progress to date, future efforts, and the broader picture of what the SciTrain University project is set up to accomplish.

**Literature Review**

**The Lack of Participation of Students with Disabilities in STEM**

Professors and faculty advisors are frequently unable or unprepared to recognize the problems faced by students with disabilities (Stefanich, 2007). Faculty and staff are frequently unaware of strategies or technologies that may be used to perform common STEM tasks that would accommodate the needs of students (Stefanich, 2001). In addition, students with disabilities, including those with learning disabilities, often encounter negative attitudes and perceptions from both faculty and other students (Stage & Milne, 1996). These students are frequently discouraged from majoring in STEM fields, and when they take these classes, they are often not fully included in the rigorous work (DO-IT Staff, 2001).

Despite policies and laws to promote inclusion, research in STEM education reveals that teachers are still not providing accommodations in the learning environment for their students with disabilities (Stefanich, 2007). Faculty must be provided with adequate training to recognize, assess, and accommodate the needs of students with disabilities, and be provided with supports to encourage them to adopt the training.

Individuals with disabilities make up about 13.7% of the school-aged population based on numbers reported by IDEA (National Center for Education Statistics, 2002). But in 2003-2004, students with disabilities made up only 11% of students enrolled in undergraduate education and 9-10% of the students enrolled in STEM (National Science Foundation, 2006). This group included over 173,000 students, a significant number who could be at risk for inadequate accommodations. The numbers drop further in graduate school to 5%. Since the late 1990s, only 1% of STEM doctorate recipients have had a disability. As a whole, students with disabilities tend to perform less well in college than might be predicted by their high school performance, and significant numbers of them do not follow through to the completion of their STEM educations (Wilczenski & Gillespie-Silver, 1992). To further illustrate the problem, national studies have shown that, compared with their non-disabled peers, students with disabilities enroll in and complete postsecondary education programs at half the rate, and, up to two years after leaving high school, about 4 in 10 youths with disabilities are employed as compared with 6 in 10 same-age out-of-school youth in the general population (National Center for Education Statistics, 2002; National Longitudinal Transition Study, 2005). This data indicates that readily available accommodations could make a substantial difference in success rates for these students.

**The Need for Readily Available Accommodations**

Most students with disabilities need accommodations to participate equally in STEM educational activities (Stefanich, 2007). While some institutions have learned to provide accessible textbooks, note takers, and exams, they are rarely as successful in providing accommodations for students in STEM classes, particularly those involving laboratories (Stefanich, 2007).

Accommodations and models to include all students in STEM education do exist, and are growing in range and effectiveness (Burgstahler, 1994). Georgia Institute of Technology’s NSF-funded *Developing Accessible Laboratory Experiments* and SciTrain projects have created important resources in STEM education that benefit all students. Many accommodations are relatively simple and low-cost and are easily implemented by STEM instructors with the proper knowledge and training (Stefanich, 2001). Accommodations can include providing magnifiers and measuring devices with large or raised numbers for students with low vision, or tactile graphics to document equipment setup or the shape of a mathematics formula (Milchus, Goldthwaite, McKelvy,
Students with dexterity limitations can be assisted by virtual dissection materials and lab tools with large handles. Students with learning disabilities can gain from cooperative endeavors among students, peers, tutors, and faculty (Stage & Milne, 1996). However, none of these accommodations will be successful without faculty who are ready and able to implement them. Such abilities are not present a priori in most cases, and must therefore be developed and cultivated.

Faculty Development Activities

The training and professional development services provided by the SciTrain University project are designed to lead to improvements in classroom instructional practice among recipients of those services. SciTrain University has initially offered all faculty development services in person, with the eventual goal of providing all of these resources online. These services support the project’s primary participants and/or other interested faculty. They are described in the table below:

<table>
<thead>
<tr>
<th>Faculty Development Activity</th>
<th>Mode of Delivery</th>
<th>Current Target Audience</th>
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</thead>
<tbody>
<tr>
<td>Workshops</td>
<td>in person</td>
<td>study participants and other interested faculty</td>
</tr>
<tr>
<td>Journal reflections</td>
<td>online</td>
<td>study participants</td>
</tr>
<tr>
<td>Classroom observations</td>
<td>in person</td>
<td>study participants</td>
</tr>
<tr>
<td>Focus group discussions</td>
<td>in person</td>
<td>student participants</td>
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In the long run, online education may be the most effective way to train the maximum number of postsecondary faculty and staff. With the exception of classroom observations, each of the services above will eventually be provided online. The online environment provides a cost-effective means of reaching the target audience, which is a large, diverse, and geographically widespread population. Online teacher training is growing in acceptance for many reasons, chief of which is its 24/7 availability to teachers nationwide who may have limited time and budgets for training (SciTrain, 2001). Online courses are especially appropriate for teachers in rural settings who are often far from urban training centers and who are without access to in-person training. Although we recognize that no educational effort is guaranteed to be successful (especially without careful program or activity design), several studies have suggested that participants in online education actually score higher than those in traditional classrooms (National Center for Education Statistics, 2002; Allen & Seaman, 2007). Nonetheless, participants in the initial group were offered primarily in-person activities because materials were still being developed for placement online. These same participants then reviewed the online materials once they were available.

Participant Selection

The SciTrain University project operates as a partnership between the Center for Assistive Technology and Environmental Access and the Center for the Enhancement of Teaching and Learning at the Georgia Institute of Technology, and the Disability Resource Center at the University of Georgia. In order to ensure its success, project leaders have targeted instructors at both institutions who can serve as participants longitudinally over the project’s three-year term. Selecting participants from 4-5 STEM disciplines, especially those that have multiple teaching assistants under them, helped jump start our initial efforts to bring STEM classes into an accessible format. As described in the introduction, the project targeted a group of interested early adopters or “champions” from among these disciplines to form this initial group. These faculty then participated in the project-sponsored workshops. They also agreed to review drafts of online training materials and/or serve as longitudinal study participants during a period of time during which they would work to implement various innovations in their classrooms.

Much of the long-term success of the project depends upon the involvement of the study participants who have committed to participating in the program on a long-term basis. In addition to their important role as a base of support for expanding our efforts to reach larger numbers of faculty, their commitment allows us to gauge the effectiveness of the program in meeting the needs of the students it ultimately serves. Longitudinal study participants take part in all of the workshops and complete the online course modules. The longitudinal study participants are assessed in a number of ways to foster their development and gauge the overall impact of the program. Assessment activities include periodic classroom observations to determine the inclusion of programmatic elements in instructional activities, online journal reflections tied to the workshops, and participation in occasional focus groups.

A second set of faculty served as project “scholars” who reviewed the online course modules, and reflected on module relevance within specific disciplines; they attended in-person workshops, and helped to disseminate
project resources. This group was not offered support for specific implementation of innovations in their own classrooms.

Training Workshops

A key element of SciTrain University has been the development of 1-2 hour workshops designed to engage STEM instructional faculty at Georgia Institute of Technology and the University of Georgia on the learning needs of their students and strategies for making the coursework more accessible. While SciTrain University is ostensibly designed to address the needs of students with disabilities, we stress the applicability of the workshops for all students. The workshops are facilitated with a focus on learner needs (Minderhout, 2007) and on constructive intervention (Liese, 2007).

During the workshops, participants apply the concepts and techniques to their own courses. For example, when addressing the use of electronic forums, the same electronic learning management system used for regular courses is applied in the workshop so that participants can see the techniques modeled for them during the workshop itself, and can immediately apply their new knowledge. Partners or small groups of 3-4 are often used to assess each other’s implementation strategies during the workshops.

Post-workshop support is provided through mentoring via one-on-one consultations and through sharing of data from assessment and evaluation efforts (described below). In this way, buy-in is dramatically increased, and faculty participants are met wherever they are at on their educational journeys so that their growth can be facilitated effectively.

To date, we have conducted 9 workshops at Georgia Institute of Technology and 6 one-hour workshops at the University of Georgia. Key topics have included maximizing the institutions’ online course components to improve student-instructor rapport, group note-taking with peer review of notes as a learning strategy, the use of electronic forums for student communication and reflection, the best use of images, tables, and charts in the classroom and online, and addressing electronic obstacles to learning.

Website

SciTrain University has also developed an extensive website containing information modules on how STEM faculty can provide accommodations for students with specific disabilities, a literature database containing over 200 journal references addressing STEM education at the university level for students with disabilities, and online workshop modules to complement (or to fully take the place of) the in-person workshops. The information modules have been designed to provide STEM instructors with some basic background on the types of disabilities they might encounter in the classroom, as well as to provide them with strategies for making material accessible to students with disabilities. Information categories addressed include transitioning from high school, universal design for learning environments, learning disabilities, attention deficit hyperactivity disorder, mobility disability and dexterity, deaf and hard-of-hearing, vision impairments and blindness, and disability laws. The workshop modules are designed around specific pedagogical accommodations that address the learning environment for all students, and particularly those with disabilities. Online workshop modules addressing large lecture classes, laboratories, and online learning environments have been created.

A robust documentation process has been necessary to capture what we have learned from our faculty who have been participating longitudinally in our study, our project scholars, and other stakeholders as they have attended workshops, struggled through the process of classroom implementation, and reviewed website materials. We have worked to document what these participants have learned about accommodating students with disabilities, and what types of actions have been elicited from participants as they transform various pieces of their classroom environments. The collection and analysis of this data are part of the project assessment and evaluation

Project Assessment and Evaluation

Throughout the project, formative assessment has been used to provide iterative feedback regarding process, materials, and performance to ensure the most appropriate and effective project implementation. Evaluation of project outcomes against the standards set out in the project proposal has also been regularly addressed. The project assessment and evaluation plan is carried out by a separate team from those directly implementing the project in order to provide an objective perspective. The team consists of two assessment and evaluation professionals, each from a different department, along with several student assistants.

Criteria

Performance criteria for the project tied into 10 activities that have been conducted over a period of three years. These activities are shown below where those addressed specifically in this paper are shown in italics:

- Research review, recruitment of STEM content expert consultants, focus groups on accommodat-
ing students with disabilities in STEM courses, integration with secondary education web resources, delivery of in-person workshops, recruitment of STEM faculty participants, delivery of online workshops, dissemination via conference presentations, materials review by users, materials revision.

The evaluation team is responsible for the process of data collection and analysis as these activities have been carried out. This process is guided by the use of a set of targeted assessment and evaluation questions pertaining to the activities and criteria. (Note: they are also designed to provide data for potential independent evaluation). These assessment and evaluation questions emerged from a logic model developed for the project.

Results of the assessment and evaluation process have been documented in regular quarterly reports that specifically address either how collected data can be used to improve the level at which project outcomes are met, or at what level the program has been performing relative to the originally proposed criteria. We are concerned here primarily with data related to our faculty participants and their development.

Users

Assessment and evaluation data are reported to the project team on a schedule that maximizes their use (Greene, 2007). In our case, this has been in the form of quarterly reports such that we can capture and synthesize knowledge during and after each semester of the project. Ongoing performance data (from event feedback forms, surveys, focus groups, and classroom observations) is offered to program staff as soon as it can be analyzed and communicated. In addition, program performance indicators detailing student course enrollments, completion, and grades are reported semester-by-semester; quarterly assessment feedback is synthesized and provided internally to the project team, and annual synthesis of the data is produced for external reporting needs. This evaluation team synthesizes data by combining two mixed methods approaches for synthesizing data: McConney, Rudd, and Ayres’ Results Synthesis Method (2002) and Campbell’s Pattern Matching method (1966).

The quarterly reports delivered by the evaluation team to the rest of the project team are formatted to include the SII model (Strengths, areas for Improvement, and Insights) described by Wasserman and Beyerlein (2007). This same approach is built into many of the instruments used for data collection from the various stakeholders in the project. Finally, Patton (1997) challenges evaluators to understand that assessment and evaluation use must be facilitated; that it rarely, if ever, happens by chance. To ensure that the evaluation plan and findings provide useful, actionable information, the evaluation team has worked with the project staff on an ongoing basis (sometimes daily) between reporting periods. This has allowed for a more robust modification of workshops; for example, workshop outcomes have been revised with each offering to better reflect and to clarify workshop participant performance criteria. It has also allowed smoother communication between project personnel and participants. For example, during a recent workshop, after a classroom observation activity with the evaluation team, one participant indicated that she would like to try a different approach than that agreed upon by others; this was communicated to project staff and quickly supported. This close working relationship has allowed a greater sense of community within the project where everyone is working together.

The results reported below, regarding longitudinal study participants’ efforts to transform their classrooms, are consistent with the approach to assessment and evaluation described above. Multiple sources of data are used and compared such that generalizations are more meaningful. Also, after each classroom observation there is a discussion with longitudinal study participants, formatted much the same way that an SII is conducted, about participants’ efforts to improve teaching and learning in their courses. The sources of this data are several specific instruments developed by the assessment and evaluation team.

Instruments

Several instruments have been designed that inform the faculty development process for SciTrain University. These are classroom observation forms, online guided journal reflections, focus groups, student surveys, and workshop feedback forms. The focus for this paper is on the classroom observation instrument and its results, though the other sources of data are cited to highlight themes, and demonstrate how the mixed-methods approach can be used to reinforce conclusions.

Classroom Observation Instrument

The classroom observation instrument was developed based on the concept of universal design for student learning (Bergstahler, 2008; DO-IT Staff, 2008). Much of the instrument is general in nature and would apply to any classroom setting (Pendleton-Parker, 2005); however, some items (such of the use of classroom note takers) were included due to their special focus within the SciTrain University project. In all, the instrument consists of 48 items (3 items were simple counts and 45 were categorical) that probe on six aspects of
instruction. The full instrument is included in Appendix A. Briefly, the items are divided into the following general categories:

- Classroom Environment – 9 categorical items
- Visual Aids – 7 categorical items, one simple count
- Oral Communication – 9 categorical items, one simple count
- Classroom Assessment – 2 categorical items, one simple count
- Classroom Note Takers – 5 categorical items
- Electronic Learning Support – 13 categorical items

A corresponding “accessibility score” is derived from the 45 categorical items coded as Y, N, or N/A during the observation. Because the instrument and scoring methodologies have been refined at several points, some inconsistencies in the data are present. However, the assessment and evaluation team has determined that these changes that will ultimately lead to an improvement in the quality of data collection are relatively minor in terms of their overall impact on a longitudinal evaluation of the classroom observations. This instrument is the primary mechanism linking longitudinal study participant actions to the classroom environment. However, this tool has been supplemented with several other sources of data.

Other Instruments

Online guided journal reflections were developed to assist longitudinal study participants in documenting their teaching and learning efforts on a weekly basis. Reminders to enter journal entries were sent weekly via email to each participant. The online form provided space for free-form written reflection on the following:

- what innovations or accommodations the instructor attempted
- how the implementation went
- what impact the changes had on student learning

Focus groups were conducted with longitudinal study participants several times during the first two years of the project. The purpose of the focus groups was to bring to light issues that might impact student learning (in particular, for those students with disabilities). The focus group protocol was set up such that participants discussed the current situation on campus for students and then contrasted that with an ideal situation. Ideas relating to both strengths and areas for improvement were solicited regarding the current situation. This was followed by a discussion of potential actions that could be taken to move from the current to ideal situation.

Student surveys were distributed to all students in courses taught by longitudinal study participants. These surveys asked about the general learning environment on campus and how it addresses the needs of students with different learning styles or accommodation needs, particularly students with disabilities. This was followed by a set of similar questions addressing the specific course taught by the longitudinal study participant. Areas addressed in the survey included physical environmental factors, instructor awareness of accommodation needs for students with disabilities, instructor use of multiple approaches to learning when designing activities for students, accessibility of materials (electronic, print, etc.), and use of SciTrain University accommodation techniques addressed in workshops.

Workshop feedback forms were distributed to all workshop participants after each session. Participants first rated the workshop on how well it achieved the stated goals or outcomes. Then they were asked to provide a written SII on the workshop.

Results

In order to provide some context to our discussion about what longitudinal study participants have learned and done, a few general results are provided first. We first address the scope of the project; then the classroom observation form data is discussed. This is our primary set of results for this paper. Finally, the results from the classroom observation form (showing improvement in accessibility of longitudinal study participant classrooms) are supplemented by results of student surveys showing higher accessibility in the classroom, by more insightful comments on workshop feedback forms, in focus groups, and in online journal reflections as time progressed for longitudinal study participants.

Project Outcomes

By the end of the first year, SciTrain University’s workshops had reached a total of 30 unique faculty members at Georgia Institute of Technology and the University of Georgia. This number approximately doubled over the next two years. In addition, a total of about 4,000 students had been impacted by the program at the two institutions during the first year. If one only counted longitudinal study participants, who provided the greatest impetus for the program’s success, a total of 2,204 students received exposure to SciTrain University based on data from the first year of the project.
Classroom Observations

We employed a project-specific instrument for classroom observations to evaluate the accessibility of instruction for our longitudinal study participants. Our procedure involves observing each participant twice per term: once within the first 3 weeks of the term, and again with a follow-up observation in the last 3 weeks of the term. This schedule has been generally effective, though some challenges periodically arise in scheduling timely observations. For example, some classes such as labs or those with projects may end typical class instruction a week or two earlier than others. Also, unexpected scheduling changes and conflicts have led to some missing data in our twice-per-term ideal. These challenges have demonstrated the value of careful planning and communication by the team. The process has become more systematic and has steadily improved the quality of our observational data. Of particular note is the utilization of two scorers for each observation. The pairing of observers has provided us with the opportunity to provide some reasonable measure of interrater reliability when presenting results to participants and in analyzing data trends. The same scorers are involved in both the beginning-of-term and end-of-term observations for any individual faculty member.

Over the course of three terms, the team has completed 80 total observations of 15 longitudinal study participants. Four of the participants have been involved continuously throughout the three terms of the study, and five of the participants have been involved for two terms. The remaining six participants have only a baseline measure of one term. This information is summarized in Table 1:

Accessibility scores are calculated as a sum/composite of the 45 items on the observation form (see categories above and individual items in Appendix A) with a maximum of score of 45 and a minimum score of -45. “Yes” is coded as a “1”; “No” is coded as a “-1”; and “N/A” is coded as “0” \( \{Y = 1, N = -1, n/a = 0\} \). Then we take each individual item and add the numerical values to create a sum by which we can compare participants.

The graph in Figure 1 presents the long-standing participants’ accessibility scores averaged across all of their observations. “Long-standing” refers to those participants with a minimum of six observations recorded; hence, Participant 7 did not qualify, even

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<tr>
<td># of Observ</td>
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</table>

* excluded in multi-term analyses, too few observations”
though he/she was technically a “multi-term” participant. All single-term participants are excluded as well. The data collected clearly illustrates a trend of increasing accessibility scores over time as our longitudinal study participants have developed over the course of the SciTrain University project. Also, note the increased number of observations through time. This is due to the addition of new participants as the project has grown.

The next stage of analysis requires that we break down what has happened to cause this increase in accessibility scores among longitudinal study participants. Below, we see the percent change in accessibility across the participant pool as a whole with respect to each of the six sections of the observation form. As described above and as shown in Appendix A, each of the sections of the classroom observation instrument probes on a particular aspect of classroom pedagogy: 1) classroom environment, 2) visual aids, 3) oral communication, 4) “clickers” (i.e. electronic personal response system), 5) class note takers, and 6) electronic learning support (i.e. course management software). Change over time is demonstrated by section-specific scores of all longitudinal study participants in a given term. The change in accessibility was calculated by comparing the first to the final observation on record for each participant. Positive change shows an increase in the final accessibility score as opposed to the beginning. Negative change shows a decrease in the accessibility score. The percentage values shown in the graph come from dividing the raw change in section item scores by the number of items (or the highest possible score in each section).

SciTrain University held workshops throughout the run of the project. The themes for each workshop revolved around specific accommodation techniques consistent with the principles of universal design for student learning. For example, one focused on in-class note taking, in which students worked in teams to produce, share, and review their notes during each class period or over a set of class periods. Another focused on electronic learning support, where students were guided to reflect on difficult course concepts, discuss issues that they were facing, or interact with the instructor and other team members to help form a sense of community — something especially important for some students with disabilities who may normally feel excluded. Because of the workshop emphasis in these areas, one might expect significant positive changes in these areas. However, post-observation meetings with instructors may have focused on other parts of the form as well. Oral communication and visual aids are particularly easy to observe, for example. Nonetheless, we see mixed results.

The graph in Figure 2 is ordered to reflect the greatest areas of improvement, by category, in average accessibility scores among our longitudinal study participants. The improvement in class notetaking suggests faculty efficacy has positively shifted regarding using student teams to produce high quality notes. This was a key focus for the workshop developer during the terms under consideration. The data for classroom environment suggests a slight decrease in accessibility, but the classroom location is typically not within the control of the instructor, and therefore these scores

![Standardized Change in Averaged Accessibility across Participation for Instrument Sections](image-url)
are sometimes difficult to increase despite the best intentions of the instructor. In addition, a few instructors showed decreases in their accessibility scores. At least two of these decreases were due to initial scores on the instrument that were very high. The assessment and evaluation team had suspected errors/noise generated in data from inconsistent observations between observers and between institutions. The ratings for these instructors decreased in subsequent observations after the observers had the chance to discuss the use of the instrument with the assessment and evaluation leadership team. It should also be noted that some of the participants had more data available than others because of longer participation, and thus had more time to “improve” their scores. This accentuates the need for an increase in consistency of measures across institutions for more accurate capture of the intervention’s success.

Of note, when the same data is analyzed within terms the changes are very small. Thus, for the most part, it seems that the changes in the accessibility scores are happening between terms and not within them. One possible reason for this includes the fact that instructional design changes can be difficult to implement once a course has started, so instructors wait to begin anew the following term. Another possibility could be changes in class locations between terms, which would lead to differences in the classroom environment section.

**Lessons Learned**

Although overall accessibility scores trended up, variability in the trendlines for change in accessibility scores of individual participants above is supported by analysis of those longitudinal study participants’ journal reflections. Three archetypes representing different types of participants were developed from the journal reflections: the “enthusiast” (these tend to have high positive changes in accessibility scores), the “incremental adopter” (these tend to have slow but steady increases in scores), and the “skeptic” (these may show decreases when new classroom approaches are tried, but then abandoned or changed quickly when difficulties arise).

Workshop attendance and feedback about the topics addressed (electronic forums and classroom note takers, in particular) reflect strong views about an area which tends to show perhaps the most variability in scores among individual instructors: electronic learning support. Part of the classroom note-taking activities implemented by instructors involves online learning support for that activity, and the electronic forums are conducted completely within the electronic learning support items from our instrument. Thus, it is no surprise that scores vary a bit wildly in the electronic learning support area while instructors implement their innovations.

Focus group discussions tended to focus on electronic learning support and aspects of the physical classroom environment. In early focus group discussions, and with those who attended workshops but did not join as longitudinal study participants, there tended to be a view that these areas were ripe for positive change but were somewhat out of their control. When one looks at the standardized change in accessibility scores for the classroom observation instrument (meaning across all participants for initial and final observation accessibility scores), these two areas were the most stable. That is perhaps consistent with the view that these areas are out of one’s control.

Finally, student surveys show that students generally feel quite satisfied with the learning experiences at their respective institutions, but feel slightly more positive about their experiences with longitudinal study participants. This is consistent with the positive (and increasing) accessibility scores generally shown previously.

**Conclusions and Recommendations**

Detailed analyses of classroom observations, workshop feedback forms, student surveys, journal reflections, and focus group results are ongoing. Preliminary analyses have provided some insights to compare classroom observation data to other data sources. In particular, data from this faculty development effort has shown an overall positive trend in faculty efficacy regarding accessibility in their classrooms. The use of classroom note takers working in teams has perhaps shown the most consistent positive gains in producing learning environments that accommodate all students, and especially those with disabilities. However, significant variation in levels of success has occurred and not all areas of accessibility have increased. Some faculty have even displayed decreases in their accessibility scores over their first few semesters of participation as they work with new techniques. Thus, a prolonged and consistent relationship with the faculty participants is essential if long-term positive results are desired for all. Exposure to alternative techniques can get participants motivated, but that excitement does not automatically translate to success. The teaching and learning journey has peaks and valleys that cannot be easily predicted.

Through a robust internal process of continuous assessment across both web and in-person training materials, the SciTrain University project has now created a tested set of online tools including information modules about
specific disabilities and faculty development workshops utilizing the concept of universal design. These tools can be accessed by individual faculty anywhere, any time. However, it is our belief that a community working together to implement concepts of universal design will more effectively address the needs of students with disabilities (and all students) in STEM courses. Further, many sources of data are needed to illuminate changes in faculty efficacy when aiming to create quality learning environments. We provide one tool here, the classroom observation instrument, and describe the components of several others that can be used in conjunction with the SII approach to analyzing performance. Overall, these tools support faculty development efforts with an eye towards universal design that can, in particular, empower the learning of our students with disabilities.

References
DO-IT Staff (2008). What are some hints for communicating with individuals who have disabilities? How teachers can fully include students with disabilities. DO-IT article #102. Seattle: University of Washington.


<table>
<thead>
<tr>
<th>Classroom Environment</th>
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<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Reminders given about electronics during class</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Reminders given about acceptable classroom etiquette</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Action taken to motivate students in class or in general</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Language used does not stereotype students</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Flexibility to address individual needs demonstrated</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Students provided with multiple ways to learn</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Content is made personally relevant to students’ lives</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Attempt to link to or build upon previous content</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Visual Aids</td>
<td>Y</td>
<td>N</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Class outline presented/provided</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Handouts provided</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Handouts highly readable</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Materials easily visible from back of classroom</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Materials uncluttered</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Materials well organized</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Variety of types of visual aids used</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Number of student questions on visual aids: _____</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Clarity:_______  Comprehension:_______</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oral Communication</td>
<td>Y</td>
<td>N</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Uses students’ names</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Lectures to the entire class</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Clearly audible from back of room</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Clearly explains visual aids</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Gives clear instructions for student activities</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Instructions for student activities repeated</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Student interaction actively facilitated</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Student activities are relevant to class</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Summarized major points</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Number of student questions in general: _____</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Clarity:_______  Comprehension:_______</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Assessment

<table>
<thead>
<tr>
<th>Assessment techniques/tools used</th>
<th>Y</th>
<th>N</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>If used, students are able to easily connect</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If used, how much ____ #instances</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>____/ _____/ ______ # items per instance</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

--- to be observed outside of the classroom ---

<table>
<thead>
<tr>
<th>Electronic Learning Support</th>
<th>Y</th>
<th>N</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Majority of students come to class with proper materials</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Online communication with instructor encouraged</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Online communication with other students encouraged</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--- to be observed outside of the classroom ---</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Materials available at least 24 hours before class</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Materials provided in accessible format(s)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Online communication with instructor facilitated</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Online communication with other students facilitated</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Options for students to post materials for class</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Options for students to post their own materials</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lectures available by audio file</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lectures available by video file</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Online audio/video materials clear/usable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students know when recordings will be available online</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Lean Program and Course Assessments for Quality Improvement
Mohamed El-Sayed \(^1\), Jacqueline El-Sayed \(^2\), Jim Morgan \(^3\), Timothy Cameron \(^4\)

Abstract
Process Education™ is founded on two basic beliefs: that no learner should be marginalized, and that educators have a responsibility to create and improve the quality of learning environments. Lean thinking, a systems approach used to improve quality in industrial and organizational settings, is also founded on two basic beliefs of respect for people and the importance of continuous improvement. The similarities between these two philosophies could be leveraged in facilitating the implementation of some of the well developed and tested aspects of lean thinking in Process Education.

One of the core principles of Process Education is the importance of assessment of performance: its purpose is to continuously improve the educational process. This paper focuses on the utilization of lean principles to guide the development of educational program and course assessment processes. It discusses the flow process in designing educational objectives and outcomes from the program level down to course learning objectives and outcomes, and the additional processes of establishing performance criteria and targets for assessment. Some illustrative examples are presented to demonstrate concepts at play during the development and implementation of the assessment process.

Introduction
The success of any educational program depends ultimately on the value it adds to the learning of its graduates, the satisfaction of its stakeholders, and the advancement of society. The degrees to which these outcomes are achieved indicate the intrinsic and perceived quality of the program. Quality, in general, depends on the inputs, the development, measures and controls, and the continuous striving for perfection. Quality in education follows the same principles (Madu & Kuei, 1993; Owlia & Aspinwall, 1996); in other words the intrinsic and perceived quality of the program is ultimately determined by the individual entering the process, the educational process itself, the assessment process and feedbacks, and the institution’s never-ending drive for perfection.

For an educational program, the learner outcomes can be viewed as the desired attributes or abilities that the learner will have attained at the successful completion of the program, while the educational objectives are the desired attributes in terms of knowledge, skills, and attitudes to be realized three to five years after graduation. Therefore, the program itself is the process through which these attributes are cultivated in the matriculating student. Each course in the program is a sub-process with its learning outcomes and objectives incrementally contributing to the final learner outcomes and educational objectives of the program. While the development is continuous in each of the sub-processes, the validation for the course and the program is distributed across the course’s duration or increments. Of equal importance are the additional processes of course and program assessments to monitor the development and validation processes (Terenzini, 1989).

Since the publication of The Machine That Changed the World (Womack, Jones, & Roos, 1993), lean thinking has provided a systematic approach to enterprise improvement. This systems-based thinking focuses on processes that create value, and, due to the proven success of this model, has been applied to other areas such as software development and health care services (Hibbs, Jewett & Sullivan, 2009; Chalice, 2007). The following discussion will describe assessment as a process for quality improvement derived from lean thinking principles.

Assessment as a Process
Process Education principles are founded on two basic beliefs. First, no one should be marginalized: all learners have the capacity to improve the quality of their learning. Every learner can learn to learn better, regardless of his or her current level of achievement; one’s potential is not limited by current ability. Second, educators have a responsibility to “raise the bar” in their profession: learning is enhanced and achieved for all learners when educators help build learning skills, create and improve quality learning environments, design solid coherent curricula, and serve as effective facilitators of learning (Burke, Lawrence, El-Sayed, & Apple, 2009; Beyerlein, Holmes, & Apple, 2007). Since all learners have the capacity to improve the quality of their learning and educators have a responsibility to “raise the bar,”

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\(^2\) Texas A&M University
\(^3\) Texas A&M University
\(^4\) Miami University
assessment is regarded as a process that facilitates the educational process; assessment of performance is a core principle in Process Education. In Process Education thinking, evaluation is a snapshot in time for validation, and is considered a product of a continuous assessment process at the specific time when it is conducted.

There is a clear similarity between the principles, foundations, and aims of both lean thinking and Process Education in terms of the use of assessment as a process and its role in continuous improvement.

**Lean Principles**

Lean thinking has been utilized in industrial and organizational settings to stimulate growth and maximize performance (Cohen & Apte, 1997). These principles are founded on respect for people and continuous improvement. There are five basic principles of lean thinking. Understanding of these five principles is fundamental to any lean implementation. These principles are:

- **Value**
- **Pull**
- **Value Stream**
- **Flow**
- **Perfection**

Figure 1 shows the five lean principles and their relationships starting from defining value to striving for perfection.

**VALUE** — The first principle in lean thinking is to understand what value is, as seen from the customer’s perspective, and to ask, What adds to that value? Second, one asks, what activities and resources are necessary to create the desired value during the development process? Any features in the product or in the steps or resources used in the process that do not add value are considered waste (Cohen & Apte, 1997). Applying this principle to assessment as a process, the following can be considered assessment process wastes:

- Over-assessment
- Lengthy assessment processes and steps
- Collecting too much assessment data
- Ill-defined performance criteria and targets
- Unclosed assessment processes; absence of corrective or improvement action based on assessment results
- Misinterpreted assessment results
- Misalignment

**PULL** — According to this second principle, nothing should be done unless it is needed or demanded by a downstream process. If this principle is applied to the process of assessment, we would say that the main value of assessment is its potential to improve the course or educational program: the periodic and timely pull of course and program assessment is the key for achieving the desired improvement. When assessment is pulled only for accreditation purposes, timely corrective actions will be missed. In addition, corrective action, if any, will be externally imposed based on a generalized set of standards arrived at with limited knowledge of the particular program in question.

**VALUE STREAM** — This term describes the steps and activities needed for creating value through the process. Since the main objective of any assessment process is adding value to the course or program all the steps and activities should be focused on growth and movement towards continuous improvement. In Process Education thinking, there is no limit to growth and continuous improvement. One of the most effective assessment tools used by Process Educators is the Strength, Improvement, and Insights (SII) method for assessment reporting (Beyerlein & Apple 2007).

**FLOW** — By adding nothing but value, the process should flow as rapidly as possible. The assessment process should flow naturally with the education process itself. The value of the education process is the learning, so the assessment process should be focused on assessing the learning, and all of the resources, steps, and activities that add to learning.

![Figure 1 Schematic of Lean Principles](image-url)
By optimizing the assessment steps and eliminating all of the assessment process wastes discussed previously, the assessment process could naturally integrate with the educational process and flow organically with it.

**PERFECTION** — The point of this principle is to continuously strive for perfection to satisfy the customer. It should be the main attitude, guide, and motivation for any assessment process in order to realize its full value. Instead of being forced through accreditation pressures, assessment should be a way of being throughout the entire educational institution. In Process Education thinking, striving for perfection through assessment is built into all processes, from classroom activities to course and program design.

**Lean Assessment Process**

To achieve a lean assessment process, the five principles of lean thinking, discussed earlier, should be the foundation of every phase of the entire process. As discussed previously, the assessment process could be naturally integrated with the educational process and flow organically with it. Lean principles should be implemented in the educational program as well. While the main value of assessment is quality improvement, it is important to differentiate between the value of the educational program and the value of the assessment.

1. **Defining Value in Education**

   In lean thinking, defining value starts with the voice of the customer. Defining the customer is somewhat complicated in the educational context since the receiver is not the only customer or client, as it may seem. At the receiving end, the educational process is a service to students. The impact, however, doesn't stop there. Students’ future employers, their professions, and ultimately the society at large are all impacted as shown in Figure 2 (El-Sayed, Zgorzelski, Berry, & Zang, 2005).

   In Figure 2, the outer provider circle represents the institution as a whole while the middle circle represents the academic departments providing the educational services. The inner and core circle represents the faculty who are designing, delivering, and assessing the educational services provided to the students. While the provider circles can be viewed as concentric with the faculty at the center, the receiver circles are tangential at the point of contact or exchange between faculty and students. The educational service provided to students by the faculty, during their exchange, can be viewed as being simultaneously delivered to potential and current employers as well as to the society at large.

   **Figure 2** Schematic of the Educational and Receiving Domains (El-Sayed et al., 2005)

   The provider and receiver circles in Figure 2 represent the stakeholders who collectively provide the voice of the customer. The educational program’s mission, vision, and educational objectives should be obtained from the voice of the stakeholders through direct or indirect assessment methods such as interviews, surveys, or focus groups, etc.

   **Example 1:**

   In a professional degree program, the following two program objectives were selected from a set of five objectives developed by the department faculty and advisory board:

   **PEO 1:** Graduates will make professional decisions with an understanding of their global, economic, environmental, political, and societal implications.

   **PEO 2:** Graduates will be committed to professional and ethical practices, continuous improvement, and lifelong learning.

   Figure 3 shows a sample of results for the perceived importance of these two program educational objectives from a survey of stakeholders, namely graduating seniors and alumni.

   From the stakeholders’ perspective, the program educational objectives are usually defined as desired attributes of graduates three to five years
after graduation. Any accreditation and discipline outcomes (program outcomes) should be integrated into the program educational objectives.

The program educational objectives, which form the desired attributes of the graduate, should be the main drivers of the program educational and assessment processes. Any program or course assessment activity that does not address these desired attributes should be considered waste.

2. Program-Level Value Streaming

To achieve the required value stream the selected objectives meeting the stakeholders’ desired attributes should be defined and further specified by identifying the set of program outcomes (POs) for each attribute. For this step, the mapping between the program educational objectives and program outcomes can be used as a guide. In addition, the mapping between the program educational objectives (PEOs) and program outcomes (POs) should be used to assure that all accreditation and other discipline-specific POs are covered by the PEOs. The following example can provide some guidance for the execution of this most important phase:

**Example 2:**

Table 1 shows a sample of the mapping of four program outcomes into the two program educational objectives discussed in Example 1.

<table>
<thead>
<tr>
<th>PO / PEO</th>
<th>PEO 1</th>
<th>PEO 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>PO 1</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>PO 2</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>PO 3</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>PO 4</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

Table 1 Sample of Mapping Program Outcomes into Program Educational Objectives

![Figure 3 Sample of Program Educational Objectives Survey](image-url)
4. Course-Level Specification and Flow

The program educational objectives and outcomes are then used to set the appropriate course learning objectives (CLOs), course outcomes (COs), course performance criteria (CPCs), and course performance targets (CPTs) as shown in Figure 5. This flow process starts from the last courses at the senior level to the entry level courses at the freshmen level. The course learning objectives, outcomes, and performance criteria for all of the courses should be aligned with the program educational objectives, outcomes, and performance criteria respectively. The course performance target levels, attained in a sequence, should lead to meeting the program performance target upon graduation.

Besides flowing from the program-level objectives and outcomes of Figure 4, the course-level objectives and outcomes are also specified using discipline-specific content as well as content needed to meet performance targets during previous assessment cycles.

**Example 3:**

The first two program outcomes of Example 2 were used as outcomes for the capstone course, the last course in the program (El-Sayed, 2008):

**CO 1:** An understanding of professional and ethical responsibility

**CO 2:** The broad education necessary to understand the impact of their solutions in a global and societal context

The performance criteria selected for these two outcomes are:

**CPC 1:** Applying the code of ethics during the projects

**CPC 2:** Understanding the impact of the decisions
Figure 6 Sample of Performance Targets and Achievements

Figure 7 Sample of Program Educational Objectives Satisfaction Survey
The performance targets selected for these two criteria are:

**CPT 1**: All students should be above 80% based on an established rubric

**CPT 2**: All students should be above 80% based on an established rubric

Figure 6 shows some assessment results for the two performance criteria of the capstone course. Not only was the individual achievement level above the target level for each student, but also the achievement average for the class was at 95% for both criteria. By consistently gaining similar results, through periodic assessment and validation, the target levels could be raised for even higher levels of achievement.

### 5. Assessment Pull and Striving for Perfection

The main objective of any educational assessment process is that of improving the quality of the educational process. Therefore, the periodic and timely pull of course and program assessments are essential for continuous improvement. Striving for perfection, however, requires continuously “raising the bar” in course delivery, program integration, and the assessment processes itself. In fact, striving for perfection within the assessment process itself is a clear indicator for striving for perfection in all aspect of the educational program.

**Example 4:**

For the continuous improvement of a professional degree educational program, the program educational objectives presented were surveyed. Figure 7 shows a sample of the satisfaction level survey results for the two program educational objectives discussed in Example 1 of both graduating seniors and alumni.

### Conclusions

Assessment of performance in higher education should be regarded as a process for continuously improving quality rather than a last-minute scramble to meet accreditation requirements. For this reason, assessment of performance is a core principle in Process Education. Since respect for people and continuous improvement are the foundations of both lean thinking and Process Education, it is clear that some of the well-developed lean thinking processes and tools can be used to achieve Process Education goals. This paper focused on using lean principles in developing an assessment process to address quality and continuous improvement issues in higher education.

The first and most fundamental principle in lean thinking is to understand value from the receiver’s perspective. Therefore, an educational program’s mission, vision, and educational objectives should be obtained by listening to the voices of the stakeholders through direct or indirect assessment methods. In addition, the program objectives should address all accreditation and discipline-specific outcomes. To achieve the required value stream, these outcomes should be further specified through a set of performance criteria and targets. The learning objectives, outcomes, and performance criteria for all of the courses in the program should flow from the program-level specifications and should be aligned with it.

Through the periodic pull of course and program assessments, in addition to eliminating any activity that does not contribute to achieving the specified targets, the rapid flow of the assessment process could be greatly facilitated. Finally, by striving for perfection through the continuous improvement of the educational and assessment processes the main goal of improving quality in higher education can be achieved.

### References


The Transformation of Education: 14 Aspects
Denna Hintze-Yates¹, Steve Beyerlein², Dan Apple³, Carol Holmes⁴

Abstract
While calls for reform in education are arguably as old as the enterprise of education itself, there is a new sense of urgency accompanying the reports of those who study the economic and cultural impacts of education, at all levels. This article offers a framework for understanding and responding to both internal (largely academic and pedagogical) and external (largely economic and cultural) pressures for positive transformation in teaching and learning. Fourteen aspects of educational cultural change are labeled, defined, and characterized in terms of historical tendencies and future directions that hold promise for better fulfillment of society's expectations and needs. For each aspect, a core set of modules is identified from the Faculty Guidebook, linking that aspect to the larger body of Process Education scholarship. Meaningful descriptors for recognizable stages of transformation within each aspect are proposed from this analysis. Each aspect is then illustrated through examples typifying student and faculty behavior, as observed in faculty development institutes, workshops, and classroom teaching on the part of the authors. Three broadly applicable tips are also given for managing affective, practical, and research issues associated with moving to increasingly transformed practices within each aspect. The finished product is packaged in a new online learning object that is currently undergoing usability testing. The article concludes with an exploration of potential future uses for the learning object.

Introduction
Governmental and business leaders have joined with the media in warning that both the economic vitality and security of the United States is in jeopardy if significant steps are not taken to reform education (COSEPUP NAS/NAE/IOM, 2007). Though the primary focus is often on K-12 education, higher education is also part of the indictment. These warnings are not a surprise to those involved in the educational community; individual educators find themselves routinely caught in multiple currents of social and pedagogical change that swirl around today's classrooms and institutions (Altbach, Reisberg, & Rumbley, 2009). The voices that are pushing, arguing, and pleading for change across the continuum of education are not in harmony, other than in their base agreement that change must happen. There is no overarching model or even singular and coherent description of what that change should be (Teachnology, 2010).

The response offered by the philosophy of Process Education™ (Burke, Lawrence, El-Sayed, & Apple, 2009) is that nothing short of a multi-layered transformation of education will lead to measurable and observable system-wide success. This requires that stakeholders at all levels engage in coordinated reflection, reinvention, and renewal. The paradigm shift offered by the precepts of Process Education is an effort to put forward a shared vision of how education should work and how improved performance can then be realized on the part of learners, educators, and administrators, if we are to achieve systemic success.

As an integral part of its efforts to make credible and accessible the promise of transformed practice through Process Education, Pacific Crest has sponsored and actively engaged in the ongoing scholarship of the Faculty Guidebook (Beyerlein, Apple, & Holmes, 2007). This, in turn, has led to other formulations and presentations of Process Education, including faculty development institute handbooks, learning objects, and student curricula. Even as the seeds of Process Education scholarship have come to fruition, there has always been a need to find ways to demonstrate that in addition to being credible and scholarship-based, Process Education is intelligible and responsive to the classroom educators who can most powerfully use what it has to offer for improving educational outcomes. Unfortunately, handing someone a Faculty Guidebook has been found to be a less-than-optimal way of initiating or supporting educational transformation, despite the wealth of scholarship it represents.

In an attempt to not only respond to the ubiquitous calls for meaningful change but to make the precepts of Process Education at once user-friendly and accessible, Pacific Crest created the Transformation of Education, a table which captures fourteen different aspects (originally called “dimensions”) of educational transformation (made publicly available in Pacific Crest’s newsletter, Reflections) (Pacific Crest, 2009-2010). This formulation of how Process Education could positively transform classroom-level practices was at once compelling and recognizable to many of the practitioners with whom it was shared. K-12 teachers saw at once the promise of the reformulation of the social relationship between teacher and

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³ University of Idaho, Moscow
⁴ Pacific Crest
student. College administrators saw that its appreciation of faculty efficacy made positive cultural change possible. In short, people generally liked what they saw.

Though resting on the scholarship of Process Education, the Transformation of Education grew organically and in response to specific situations and concerns. As such, it was uneven, and while it did focus on many areas of general concern, it was silent about others or dealt with them only indirectly. This work was undertaken to give the Transformation of Education tables the rigor and scrutiny previously reserved for Faculty Guidebook modules. The revised tables in this paper and companion learning object are the outcome of this effort.

Development Process

The mechanics of the project development phase were complicated by the fact that the team members were separated from one another by an average of eight time zones and more than 4,800 miles; this meant that an asynchronous collaborative work environment was an absolute necessity. As a result, the vast majority of work took place on a secure online discussion board where threaded discussions, online polling, and shared documents made productive collaboration possible.

The significant steps in the process of developing the Transformation of Education learning object to this point are offered below. The steps demonstrate not only how profoundly this ongoing project is influenced by the larger body of Process Education scholarship and expertise, but also how responsiveness to internal and external concerns was considered of paramount importance.

1. Inventory Faculty Guidebook modules that are most topical/responsive to pressures for change in higher education.
   *What modules catch people’s attention? What modules do people seek out?*

2. Brainstorm modifications to the first-generation Transformation Table as a pathfinder to Faculty Guidebook modules that support classroom-level professional development in needed areas in higher education (includes feedback from Process Education workshop and faculty development events).
   *How do we group or classify the aspects of Process Education that are most responsive to the current calls for educational change at the classroom level?*

3. Define specifications for updated transformation table elements likely to be more engaging and meaningful to a wide audience.
   *What questions do we seek to answer and what information do we choose to give?*

4. Rephrase, define, and analyze existing aspects for inclusion/exclusion.
   *Are we repeating ourselves? Have we conflated topics that are arguably distinct simply because they are related?*

5. Propose, define, and analyze missing aspects for inclusion/exclusion.
   *Have we neglected to make explicit any implicit knowledge?*

6. Select RED, YELLOW, and GREEN descriptors for stages of transformation associated with each aspect.
   *How do we typically, concisely, and intelligibly describe performance at these significant points in the process of transformation?*

7. Describe RED and GREEN characteristics for each aspect.
   *What is the RED/GREEN like? What tropes or tendencies does each entail?*

8. Describe RED and GREEN cultural pressures for each aspect.
   *What voices, movements, or tendencies exist to either keep an educational practitioner with the traditional practices (RED) or urge them to new and/or potentially transformative practices (GREEN)?*

9. Propose tips for implementing emerging practices in the movement from RED to GREEN within each aspect.
   *How do people move from RED towards GREEN? What emerging practices initiate and perpetuate that movement?*

10. Identify the most relevant, informative, and efficacious Faculty Guidebook links for each aspect.
    *Given the vast body of Process Education scholarship available in the Faculty Guidebook, what individual modules are most responsive to the notion of transformation in this aspect, have the most to say about the aspect, and/or best describe the transition from RED towards GREEN in that aspect?*

11. Craft compelling RED and GREEN student examples and faculty examples for each aspect.
    *Based on our experience, what does it look like when an individual operates on the basis of traditional practices (RED) or transformative practices (GREEN)? How do students and instructors react? What do they say? What do they do?*
12. Review aspect contents for audience impact and internal alignment.
   
   *Does what we have to share actually connect with the concerns/observations others have? Have we created a valid representation of Process Education and the best practices that typify it?*

13. Review the entire table for clarity, completeness, and complementarity.
   
   *Does each aspect complement the others? Do all work together to mutually reinforce the definition and vision of Process Education? Does the Transformation of Education support the Compass of Higher Education as an end-state goal for education?*

14. Package as an attractive e-learning object.
   
   *Can we create a version of this information so that it is attractive, user-friendly, web-based, and can be easily upgraded/edited?*

15. Validate the finished product with Academy focus groups and identify promising avenues for educational research involving the updated Transformation of Education learning object and table.
   
   *How do we most efficaciously and efficiently go about disseminating the learning object and its contents for further review, development, and use?*

---

**Learning Object Design**


It presents 14 aspects of transformation in education (i.e., teaching and learning), ordered alphabetically: challenge, cognitive complexity, control, delivery, design, efficacy, feedback, measurement, ownership, relationship, scope of learning, self-awareness, social orientation, and transparency.

The introduction to the learning object (Figure 1) aims to sensitize a reader/viewer/learner to a critical fact: that educational transformation is nothing less than the positive and purposeful transformation of every individual who is involved in education. This means that the Transformation of Education is really about transforming ourselves — encouraging not only our own growth but our awareness of our growth as a continuing process. The optimal mindset for an individual exploring the Transformation of Education is therefore one of reflection with a willingness to ask, “Where am I?” and “What are my values and beliefs?” with respect to the stages of transformation within each aspect.

Each page (in the written presentations that follow) or screen (in the learning object) of the Transformation of Education is comprised of the following elements. These elements are fully populated for all 14 aspects.

---

**Figure 1** The home page and introduction screen for the Transformation of Education learning object (www.transformation-of-education.com) (Pacific Crest, 2011)
Label
• Short and value-neutral phrase that represents each aspect in a way that is faithful to our shared Process Education experience but which is also accessible/meaningful to a general audience

Definition
• Meaning of each aspect within the context of higher education

Stages
• Insightful and parallel descriptors of RED, YELLOW, and GREEN positions that span historical tendencies and future directions within each aspect

Characteristics
RED  historical tendencies of teaching/learning with respect to each aspect
GREEN  future directions in teaching/learning with respect to each aspect

Cultural Pressures
RED  pressure to sustain historical tendencies in teaching/learning within each aspect
GREEN  pressure to explore future directions in teaching/learning within each aspect

Student Examples
• A typical and familiar instance of the RED or GREEN behavior from a student’s perspective. [Note that in some examples, the student reacts to the faculty member’s demonstration of RED or GREEN behaviors, attitudes, and practices (i.e., wanting GREEN when the classroom practice is RED or vice-versa). In other examples, the student demonstrates the RED or GREEN behavior, attitude, or practice. The reasoning for this is that, by the time a student has made it to college, he or she has been the beneficiary of, on average, twelve years of socialization to the predominant educational practices, for better (greener) or worse (redder). It goes without saying that students’ attitudes and practices can still be positively transformed by what goes on in the classroom (were this not possible, education itself would not exist); this serves to underline the tremendous responsibility on the part of the faculty member for transforming the culture and practice within his or her own classroom.]

Faculty Examples
• A typical and familiar instance of the RED or GREEN behavior from a faculty member’s perspective

Faculty Guidebook-Related Modules
• Up to six modules that are most relevant/informative about understanding or implementing the GREEN perspectives or practices of that aspect

Tips
• Suggestions for classroom-level or other faculty-controlled practices that initiate or perpetuate movement towards the GREEN

The aspects are arranged in alphabetical order for ease of use. While other arrangements are certainly possible, it is critical to keep in mind that they are aspects of the process of transformation (lit. “things looked at” from the Latin) and not orthogonal dimensions. As such, they are highly interrelated and mutually reinforce one another in important ways.

Usability Questions
Even as Pacific Crest fully intends to use the Transformation of Education learning object to further its faculty development goals, the authors of this paper also plan to submit the learning object for additional review, assessment, and testing by selected groups and individuals. In this spirit, we have developed the following potential questions to submit to reviewers and assessors. While this list is not comprehensive, it does demonstrate the desire for the Transformation of Education to be as clear and accessible as possible.

• Based on your knowledge of Process Education, is there strong alignment between the aspect labels, the definitions, and the RED/YELLOW/GREEN descriptors?
• Based on your knowledge of Process Education, is there strong alignment between the aspect labels, their definitions, and the RED/YELLOW/GREEN descriptors for the stages of transformation within each aspect?
• Are the set of 14 aspects sufficiently distinct and complete?
• How accessible and engaging to a wide faculty audience are the aspect labels, their definitions, and the RED/YELLOW/GREEN descriptors for the stages of transformation within each aspect?
• How well do the RED characteristics and cultural pressures describe the context for historical tendencies in teaching/learning within each aspect?
• How well do the GREEN characteristics and cultural pressures describe the context for future directions in teaching/learning within each aspect?
• How effectively do the RED examples complement the list of RED characteristics and cultural pressures?
• How effectively do the GREEN examples complement the list of GREEN characteristics and cultural pressures?
• How accessible/inviting are the implementation tips for transforming from historical tendencies to future directions within each aspect?
• How appropriate and authoritative are the suggested Faculty Guidebook modules for each aspect?
• How effective is the overall organization and content of the learning object in generating interest about improving faculty/staff teaching performance?

Conclusions

The Transformation of Education, even in its early stages, was appreciated by the participants of Pacific Crest faculty development events as more immediately accessible and helpful than the Compass of Higher Education (Pacific Crest, 2011). As a result of this kind of feedback, it has been included in a number of Pacific Crest institute handbooks, as the centerpiece of an activity, “Exploring Educational Transformation.” It has also been handed out as a single-page flyer to hundreds of conference attendees and educational professionals. One result is that the Compass is now presented as a kind of snapshot of a successful post-transformation environment. As elegantly as we believe the Compass demonstrates the interworking of the five roles for faculty in an enriched learning environment (and it is the official and trademarked logo for Pacific Crest), it requires readers or viewers to have an appreciation of their current location even as they work towards or contemplate working towards the end state captured by the Compass. This asks far more of a typical educational practitioner than should be the case; those who are least able to recognize the implications of the Compass are probably those most in need of the transformation it implies. If the Compass is a picture of the destination, the Transformation of Education is a roadmap with directions for getting there.

Feedback on the early iterations of the Transformation of Education noted a desire to look more closely at “the YELLOW practices.” The YELLOW descriptors were absent from previous versions of the Transformation; again, it was assumed that practitioners who could appreciate or understand the RED and GREEN descriptors would be able to interpolate what a “YELLOW practice” might look like. This was a faulty assumption and the subsequent work to include these descriptors uncovered issues that, when addressed, served to make the Transformation more environmentally responsive and robust. To revisit the map metaphor, an occasional signpost is not at all a bad idea.

The explicit inclusion of YELLOW on the spectrum of transformation (red to YELLOW to GREEN) has wider implications than merely signposting a mid-range practice, however. A YELLOW practice is, almost by definition not a GREEN practice. But neither is it a RED practice. If the goal is to help faculty move away from RED and towards GREEN, any practice that facilitates that shift is worthy of recognition and support. Yellow is not an end in and of itself; it is certainly not the goal. But it is movement and in the most positive direction. Making the YELLOW stage of transformation explicit serves to communicate that transformation is not an all-or-nothing proposition; it does not take place during a single moment or by means of one changed practice. It is an ongoing challenge with potentially infinite states and shades of practice between RED and GREEN.

One final note on the RED, YELLOW, and GREEN: The authors have chosen to respect traditional (red) practices by not characterizing them with scarlet descriptors (red practices that, far from being workable, are often destructive and even debilitating in their negative impact on student learning). Similarly, those who are developing in their pursuit of the GREEN are probably “in the YELLOW.” In fact, the GREEN is always advancing and one is never “there” for long.

Recommendations

A number of enhancements to the Transformation of Education are anticipated beyond the development reported here. Current plans include the creation of a self-assessment scorecard for each aspect. This will allow individuals to gauge their current location on the continuum of transformation for that aspect by responding to an online and interactive rubric. Another avenue for application is the creation of learning activities that support more intensive examination of individual aspects in the context of thematic faculty development workshops or institutes. The Relationship aspect, for instance, is key to developing and improving mentoring skills. Perhaps the most immediately promising use for the Transformation of Education is as a primary navigator for the Faculty Guidebook. The Transformation offers a direct connection to more than 50 core modules from the Guidebook, which means that access to the Guidebook on the basis of individual aspects of transformation is already possible. More than 200 references to educational literature support these modules, and,
in turn, the Transformation of Education. If the Transformation is as attractive, user-friendly, and useful as we believe it to be, putting the best and most pertinent of Process Education scholarship in the hands of those using the Transformation is suddenly that much easier. The second tier of references within each Guidebook module, that indirectly supports each aspect, meets the needs of educational researchers without confounding initial inquiry by the classroom practitioner. Current plans include piloting the Transformation as this kind of Guidebook navigator in future Faculty Guidebook workshops. Feedback from participants at these workshops will guide further development and implementation of the learning object.

Acknowledgements

The authors would like offer their sincere appreciation for reviewers of this project. Foremost among these are members of the Academy of Process Educators, especially Tris Utschig (Georgia Institute of Technology), Barbara Williams (University of Idaho), Cy Leise (Bellevue University), and Joann Horton (I-Star Foundation). Their energetic workshop participation at the 2009 Process Education Conference served as a catalyst for this effort. Special appreciation is also offered to Al Rowe (Kirkwood Community College), Wade Ellis (Educational Consultant and Author), Kathy Burke (SUNY Cortland), Victor Harms (Bellevue University), Peter Smith (Saint Mary’s College, retired), and Marie Racine (University of the District of Columbia) for their thoughtful consideration of the usability questions and for their contributions as late-stage reviewers.

References


### CHALLENGE

The degree to which increasing the level of difficulty is used in order to grow capacity for learning and performing.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Cultural Pressures</th>
<th>Student Example</th>
<th>Faculty Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is concerned with comfort/safety; Accommodates for weakness and/or disability; Offers gratuitous praise; Sets limitations on the basis of cultural bias</td>
<td>Protect others from failure, criticism, and other ‘ego hits’ to preserve self-esteem; Sharing risk</td>
<td>Tania is excited to find out that there are unlimited retakes for her math exams. She can continue to take each modular test until she passes it. “I used to get really nervous before tests but now it doesn’t matter because I can just take it again if I don’t do very well.”</td>
<td>Inner City Community College was struggling to meet the accreditation requirements for its new nursing program. After spending time on campus and appreciating that many of the students at the college were minority students receiving high levels of financial aid, the accreditation team decided to soften their initial recommendation from a “weakness” to a “concern.” Most members of the team felt that because the program was so important for meeting community needs that downplaying identified problems and giving the program some additional time to get up to speed would not be a bad idea.</td>
</tr>
</tbody>
</table>

| TIPS FOR MOVING FROM RED TO GREEN | Don’t do for students what they can learn to do for themselves. | Maintain expectations for learners, even in the face of learning adversity (use tough love; personal factors exist but can’t be used to lower expectations). | Choose to intervene on process (i.e., learning skills) rather than content (i.e., information and techniques). |

### Characteristics
- Concerned for enduring personal/professional growth; Asks others to do things that exceed their current capabilities; Offers well-founded praise; Believes in unlimited potential

### Cultural Pressures
- Need to solve problems at the lowest level possible within organizations; Need for self-directed learners and problem-solvers; Pressures for self-sufficiency and self-reliance; Every job needs stronger performers, Increased productivity; Life-long learning (constant challenge); “That which doesn’t kill you, makes you stronger”; Strength and growth as a result of adversity

### Student Example
- The difficult (and sometimes painful) lessons that Fred learned about team leadership during problem-solving contests have helped him become more confident at playing a leadership role. It wasn’t easy and he’s still learning but now appreciates that no one allowed him to leave “the hot seat” when the going got tough. “Believe it or not,” he says, “I can actually see myself stepping forward for something like student government.”

### Faculty Example
- The faculty teaching the first and second semester of calculus organized a debriefing session with student employees from the tutoring center to highlight concepts that students find most difficult and to share ideas for promoting proficiency with these concepts.

3.1.7 Setting High Expectations 3.2.1 Overview of Facilitation 3.2.7 Constructive Intervention 3.2.8 Constructive Intervention Techniques 4.3.4 The Accelerator Model
COGNITIVE COMPLEXITY

The degree to which training and doing is elevated to problem solving and research

<table>
<thead>
<tr>
<th>Characteristics</th>
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<th>Faculty Example</th>
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<tbody>
<tr>
<td>Has implicit assumptions; Relies on the static and historical; Believes analysis is the most important thinking skill; Values expediency; “Practice makes perfect”; Limits context to immediate need</td>
<td>Proven solutions; Cost of original development limits willingness to do more; Concern for efficiency (time and cost); Turnkey solutions</td>
<td>Fred thinks that homework and tests which cover material for which there has not been explicit instruction/examples is unfair. He knows what has been covered in lectures and reading, but objects to exam questions like #5: The author introduced three possible explanations for why X works. Come up with a different one and explain it. Such questions are just too much. “That’s the kind of thing that experts get paid to do,” he grumbles.</td>
<td>The tenure and promotion process at a local university is being reworked on the basis of Boyer’s Model (professorial functions of discovery, integration, application, and teaching). The committee in charge of drafting the performance criteria is up in arms. “This is ridiculous,” says their spokesperson, “We have always been able to select faculty on the basis of our experience. Requiring us to spend time writing criteria means that we’ll be bogged down in trying to identify and describe things that can’t always be explicitly stated. We know what we’re doing.”</td>
</tr>
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Edited for length; learning object is slightly more detailed.

| TIPS FOR MOVING FROM RED TO GREEN | Write and sequence critical thinking questions to unlock key features of models. | Incorporate problem-solving projects into courses. | Document assumptions, discoveries from learning, and reflection on solutions in a personal logbook. |

Related Modules

2.2.1 Bloom’s Taxonomy—Expanding Its Meaning 2.2.2 Elevating Knowledge from Level 1 to Level 3 2.2.3 Developing Working Expertise (Level 4 Knowledge) 2.2.5 Overview of Critical Thinking 2.2.6 Overview of Problem Solving
CONTROL

The locus of power/authority for the learning situation or experience

<table>
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<tr>
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<th>Cultural Pressures</th>
<th>Student Example</th>
<th>Faculty Example</th>
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<tr>
<td>Has the mindset of an expert; Generational differences—is a digital immigrant; Is concerned with instructional efficiency; Overcompensates for fear/inexperience by controlling; Holds traditional faculty assumptions/perspective; Asks, “Have I covered the syllabus?”; Values dictation over facilitation</td>
<td>Expanding course loads; Reduced funding for teaching assistants, lab equipment, instructional software, and faculty development; Creating new courses or heavily modifying existing courses is very time-consuming; Limited professional development and support due to turnover in teachers and use of adjuncts/TAs to teach; Pressure for research/publication supplants focus in the classroom</td>
<td>Lydia doesn’t mind missing every other Friday in her psychology class because the professor uses that day to share excerpts from an article he’s writing for publication. She can’t see that it’s related to what they’re studying and he tends to be condescending when students ask questions.</td>
<td>Will has given up collecting homework assignments in his introductory physics class because he has begun to suspect that some of his students have been using the Internet to seek out information beyond what is offered in lectures and the course text. “This is my course and it has been very carefully designed to expose them to a specific set of ideas in a specific order. When they turn it into an information free-for-all, there’s little reason for me to even be here. If that’s how they want to learn, why take my course?”</td>
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**TIPS FOR MOVING FROM RED TO GREEN**

Where appropriate, use digital technology to engage students with course material, inside and outside of class. Refrain from doing things for students that they can learn to do for themselves. Conduct a mid-term assessment to take stock of how well your course meets goals, as set out in the syllabus, as well as learner expectations.

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<tr>
<th>Characteristics</th>
<th>Cultural Pressures</th>
<th>Student Example</th>
<th>Faculty Example</th>
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</thead>
<tbody>
<tr>
<td>Believes learner engagement is critical for learning success; Generational differences—is a digital native; Concerned with instructional effectiveness; Trusts in ability/experience and support; Views self as a facilitator of learning working to create independent learners; Able to hold student assumptions/perspective; Asks, “Have I helped my students achieve the learning objectives?”; Designs course/teaching to respond to student needs; Values facilitation over dictation</td>
<td>Poor learner engagement hinders the professional and social preparedness of the next generation; Wide availability of student-friendly resources and technology</td>
<td>Joseph welcomes the opportunity to provide feedback on what he found most valuable and most confusing each week through the use of one-minute papers. While class time is limited, his instructor encourages students to use the course discussion board to explore and share with one another about the issues that cause confusion.</td>
<td>Rose has learned the value of having her students self-score and self-assess their homework before turning it in for her review each day. “For years I thought this was a ‘no-no’ because I was supposed to be the authority in the classroom – I knew how to tell a right answer from a wrong answer; how could students struggling with the ideas know that? But over time I’ve learned to appreciate that when students assess themselves, they catch things in a way that allows them to make immediate connections and corrections. When I just mark an answer wrong, they’ve been graded, but how much do they learn from that?”</td>
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1.2.2 Profile of a Quality Learner 3.2.2 Profile of a Quality Facilitator 3.2.3 Facilitation Methodology 3.3.6 Mid-Term Assessment
## DELIVERY

The means by which information/knowledge is obtained by learners

<table>
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<th>Characteristics</th>
<th>Cultural Pressures</th>
<th>Student Example</th>
<th>Faculty Example</th>
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<tbody>
<tr>
<td>Prefers a lecture format and dissemination of knowledge/information; Believes that students/learners are empty vessels or blank slates, and that they should passively and meekly absorb knowledge; “Sage on the stage”</td>
<td>Storytelling; Oration, speeches, and other passive media (radio, television, movies); Respect for authority/wisdom; Consumer-based society; Efficiency; Control</td>
<td>Danielle, a communications major, is taking an economics course this semester. She is relieved that the class consists of lectures, reading, and exams. A friend of hers is taking the same course, but a different section with a different professor, and they have to form a fictional company and plan and track things. She says, “That might be something that business majors need but I just need the credits. I do the readings, I take notes on the lecture; as long as I can give all that back on the tests, I’ll be fine.”</td>
<td>Nadia is a visiting professor and something of a media darling in her field. She is well-known, well-liked, and an acknowledged expert. Her lectures are popular, often drawing attendance from those who are not in one of the two courses she agreed to teach. She is an interesting speaker but does not take questions nor does she find staying for follow-up discussion an efficient use of her time.</td>
</tr>
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### TIPS FOR MOVING FROM RED TO GREEN

- Mix it up. Commit to limited activity periods or days interleaved with a more traditional lecture or presentation format.
- Recognize that when students have a question, they are signaling interest; use that interest to let them drive additional thinking, learning, and exploration.
- Find opportunities for students to “prove out” or “verify” principles and tendencies rather than just sharing them.

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<tr>
<td>Believes that curiosity motivates learning and that discovery is education; the Montessori method; Sees the educator as a facilitator or “guide on the side”; Believes that students should actively learn by doing; Seeks out knowledge/information</td>
<td>Apprenticeships and Internships (practical experience); Laboratory learning; Real-world learning</td>
<td>Seth loves his Business Entrepreneurship course. Each major theme they study immediately becomes a challenge for the student groups who are responsible for doing research, designing their mini-project, and actually putting it into practice. Last week’s challenge, to find a way to turn a box of rubber bands into a viable business product, complete with a marketing plan and video of the project, was incredible. According to Seth, their team sort of “crashed and burned,” but what they learned will stay with each of them for a lifetime. “When you’ve had to be in the hot seat and not only solve problems but find them in the first place, you know you’re really learning and not just working for a class or grade…would you like to buy a rubber band?”</td>
<td>Phil’s wife jokes that if things don’t work out at the university, he’d make a wonderful kindergarten teacher. He teaches in the education department and is passionate about his students putting ideas into practice and learning by getting their hands “dirty.” He routinely tasks his students with designing and implementing “experiments” based on whatever educational theory they’re studying at the time. He says, “They’ve got to take these ideas, some of them pretty esoteric and theoretical, and explore them themselves. They need to know what these theories translate to in the real world, long before they have students of their own.”</td>
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2.4.3 Overview of Learning Activities  3.2.5 Creating a Facilitation Plan  3.2.9 Facilitation Tools  3.3.4 Problem-Based Learning
# Design

The purposeful arrangement of instructional environment, materials, and experiences to support learning.

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<th>Cultural Pressures</th>
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<th>Faculty Example</th>
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<tbody>
<tr>
<td>Is a design “traditionalist”; Always uses designs in a specific way; Believes that design is linear and immutable; Supports designs on the basis of historical goals, values, definitions, and identities</td>
<td>Meet the needs of a specific audience; Minimize variability in outcomes (pursue consistency across programs, courses, and activities); Lessen the need for individuals to work in constructing their own courses or activities</td>
<td>Ted likes to have a clear roadmap of where he is in the course and feels that he gets more out of classes where there is a fixed lesson plan that he can review ahead of time. “I don’t like surprises and the less I have to worry about where we’re going in class, the happier I am. Last week, our instructor spent like 45 minutes addressing questions. Where does that leave things? We didn’t get the rest of the lecture, even though he said that the questions all pertained to issues critical for our understanding. We’re really off script here.”</td>
<td>In an effort to provide a uniform core literature experience, all freshman seminar classes read the same novel and answer the same critical thinking questions. “No, not everyone appreciates the value of this kind of consistency,” admits the department chair, “but some of our instructors don’t have a lot of experience, and centralizing course planning and design at least keeps all the students on track. I’d rather have that than take the risk of letting each instructor pick and choose what content is appropriate for these kids.”</td>
</tr>
<tr>
<td>Is a design innovator; Uses designs in multiple ways; Believes that design is often non-linear, easily reconfigured, and adaptable; Makes design changes based on shifting needs and context; Values relevance more than consistency</td>
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### TIPS FOR MOVING FROM RED TO GREEN

- Provide multiple entry points based on learner experience/background.
- Integrate process and content elements around compelling context(s).
- Support a variety of implementations from a common core.

2.4.1 Overview of Instructional Design 2.4.14 Designing Process-Oriented Guided-Inquiry Activities 2.4.15 Writing Critical Thinking Questions 2.5.3 Distinguishing between Problem Solving, Design, and Research 3.2.6 Identifying Learner Needs
Efficacy

The well-founded belief in one’s capacity to change and to make a difference

Characteristics
Believes that success depends on others; Often rationalizes, complains, demonizes; Is negative and defeatist; Is unable to internalize success and accurately self-assess

Cultural Pressures
Acceptance of negativity; Disproportionate power given to nay-sayers; Conservative responses based on worst-case scenarios

Student Example
Joey is seriously considering changing his major. He failed his biology course and knows he’s not smart enough to do more than barely pass if he takes it again, no matter how much he studies. “Yeah, this is sort of the death of my dreams but I’ll figure something out. Hey, if nothing else, I’m a great example of learning to have realistic expectations, right? I guess that’s worth something.”

Faculty Example
Mary Ann believes that her job is to teach, but it’s up to students to decide whether or not they want to learn. “Too many kids go to college because they think they’re supposed to; not because they belong there,” she says. “I doubt seriously that half my students can do what it takes to pass my class, let alone graduate, no matter what I do. The sooner they learn they’re not cut out for college, the less painful it will be for them. If my class is where that happens, so be it.”

Embrace opportunities for personal and community growth.
Confront negativity and uncertainty with well-grounded steps forward.
Accept authority and accountability for what happens around you.

Characteristics
Believes that success is up to oneself; Demonstrates self-confidence and willingness to take responsibility; Able to validate (and self-validate) learning and performance; Is able to internalize success and recognition of accomplishments, as well as to accurately self-assess

Cultural Pressures
Acclaim for principle-centered leadership; Hunger for good ideas and processes; Benefits of being part of a successful enterprise

Student Example
Suzanne knows that she is capable of finishing the nursing program and that her passion and knowledge can make a real difference in the world around her. She has volunteered four hours per week to work at a neighborhood AIDS clinic and plans to spend some time with the Peace Corps or a similar organization after she graduates. “I know that I’m going to fail sometimes but failure isn’t permanent. It just means that you get yourself back together, plan better, work harder and go at it again. When I look at what others with fewer advantages have accomplished, I know I can achieve my goals.”

Faculty Example
Dr. Montes believes that his ongoing professional and personal development not only keeps him sharp, but also allows him to consistently improve his teaching. He recently participated in a mentoring project sponsored by the campus CTL center and he is excited at being able to use his new perspective and an array of intervention techniques to help his students learn more successfully.

2.2.8 Process Education as a Motivation and Self-Regulation System
3.3.5 Self-Validation of One’s Learning 4.2.2 Becoming a Self-Grower
4.3.3 The Language and Culture of Success
<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Believes that feedback is most useful to and most needed by a third party; Is judgmental; Uses standards to judge performance; Demonstrates a compliance mindset</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultural Pressures</td>
<td>Results in success or failure; Involves debate about raising/lowering standards; Scoring and judging (Olympics, sporting events, entertainment, etc.); The “C/A/whatever” student</td>
</tr>
<tr>
<td>Student Example</td>
<td>Tom is motivated by grades: to him, the only things that matter are the scores at the tops of the tests/papers and what they do to his GPA. “I earned an A on my last term paper but my professor wrote all kinds of notes and circled some stuff. One of the notes said, ‘Strong evidence, Tom, but there are some other sources you might want to check out as well,’ and she actually wrote down two articles she knew about. Seriously?? Why would I want to do that? I got my A and keep my scholarship.”</td>
</tr>
<tr>
<td>Faculty Example</td>
<td>The department chair is looking forward to a positive accreditation visit so that her faculty can get back to their teaching and research responsibilities. “You can’t get away from these visits but we’ve crossed our t’s and dotted our i’s, so we’ll be fine; we always are. I understand we have to satisfy their requirements; so be it. But we’ve all got better things to do with our time.”</td>
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<table>
<thead>
<tr>
<th>TIPS FOR MOVING FROM RED TO GREEN</th>
<th>Agree on performance criteria with the performer before observing.</th>
<th>Find strengths before identifying improvements.</th>
<th>Pursue assessment activities that lead up to high-stakes performances.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Believes that feedback is most useful to the performer; Is interested in improving performance; Uses criteria to analyze performance; Demonstrates an added-value mindset</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultural Pressures</td>
<td>“There is always room for improvement”; Coaching and analysis of past performance is used to improve future performance; Analysis of performance leads to the next round of action plans</td>
</tr>
<tr>
<td>Student Example</td>
<td>Susan enjoys having her cousin read her papers and describe the strengths that he sees as well as ideas for how her prose could be cleaner and clearer. “Allen’s feedback is so helpful. I don’t need a critic telling me my writing doesn’t work or is awkward or whatever. Allen cares enough to give me the kind of feedback that helps me become a better writer.”</td>
</tr>
<tr>
<td>Faculty Example</td>
<td>The faculty team teaching the capstone course meets regularly to review previous classes, document lessons learned, and make plans for future sessions. “You should have seen us during the first two weeks,” laughs Gavin, “We were like the Keystone Kops. But getting together to not only plan but do a kind of ‘post-game analysis’ of what worked and what didn’t has made all the difference in the world.”</td>
</tr>
</tbody>
</table>

Related Modules

1.4.6 Overview of Evaluation  4.1.1 Overview of Assessment  4.1.2 Distinction between Evaluation and Assessment  4.1.6 Performance Levels for Assessors  4.1.9 SII Method of Assessment Reporting
### Characteristics

| Trusts personal judgement above formal measurement methods; Believes that statistics always lie; Awkwardly uses even simple measurement tools; Relies on personal preference/taste/predilection; Amenable to accusations of favoritism or preferential treatment |
| Strong personalities need less data to support their beliefs and conclusions; Performances that matter are often complex and difficult to measure; Training is required to use measurement tools, ‘Art’ is something that cannot be measured; Quality is in the eye of the beholder |
| Adept at using both holistic and analytic rubrics; Seeks to eliminate personal bias in data collection, interpretation, and decision-making; Examines outliers for new insights; Thoughtfully connects research questions, measurement methods, and analysis |
| Commitment to build quality in at the source rather than inspect quality in after the fact; Minimization of variability through use of standard procedures |

### Cultural Pressures

| Student Example |
|漂 through the paper and sees no comments or notations at all. She asks Martin how he did. He shows her his paper: A+. Ellen asks Martin if she can look at his paper and he hands it over happily. Ellen verifies that they both met the length requirement, cited the same number of sources in the specified format, and used correct grammar and punctuation — the complete list of requirements they were given. “Why did you get an A+ and I get a C?” she asks. “Maybe she just liked my topic better,” Martin responds. “Maybe,” she thinks, “I sure wish I knew.” |
| Faculty Example |
| In addition to teaching a full course load, Kimzey is also a novelist and a regular at local writers’ workshops. He is proud of his expertise and enjoys sharing his critical sense with aspiring writers. “There’s a reason that writers talk about inspiration and the muses; all the mechanics aside, writing really is an art and as an artist, I am in an excellent position to critique the work of other writers. When I tell a student or would-be writer that his or her argument paper just wasn’t convincing or that the dialog between characters was inauthentic, they need to take that to heart.” |

### TIPS FOR MOVING FROM RED TO GREEN

| Remember that measurement is a neutral activity; it can be used for assessment as easily as for evaluation. |
| Limit measurement to what matters most. |
| Increase measurement reliability through testing and refinement. |

### Student Example

| Ellen received her second topic report back today and was dismayed to see that she received a C. She flips through the paper and sees no comments or notations at all. She asks Martin how he did. He shows her his paper: A+. Ellen asks Martin if she can look at his paper and he hands it over happily. Ellen verifies that they both met the length requirement, cited the same number of sources in the specified format, and used correct grammar and punctuation — the complete list of requirements they were given. “Why did you get an A+ and I get a C?” she asks. “Maybe she just liked my topic better,” Martin responds. “Maybe,” she thinks, “I sure wish I knew.” |

### Faculty Example

| Hannah, a poet, also teaches composition and technical writing. “Kimzey and I really disagree about some of this. Nearly all writing is amenable to close rational analysis. With composition, we can focus on things like ‘authenticity of dialog’ or ‘methods of rhetorical persuasion.’ There are real components there that can be qualitatively measured or at least gauged.” In her courses, Hannah offers analytic rubrics and helps students use them to analyze sample compositions and examples of polished technical prose. “As we work through the rubrics together, looking at something like Hemmingway’s *Old Man and the Sea*, they really begin to understand that the components of writing can be handled more or less successfully. When they start to get that, the quality of their own writing tends to shoot through the roof.” |

### Related Modules

- 1.4.1 Overview of Measurement
- 1.4.2 Fundamentals of Rubrics
- 1.4.5 Performance Levels for Learners and Self-Growers
- 2.4.10 Course Grading Systems
# Ownership

The degree to which the learner accepts responsibility and accountability for achieving learning outcomes

| Characteristics | Requires prompting and monitoring by others in order to initiate and persist; Is sensitive to activities having well-defined resource requirements; Believes that resources need to be introduced and integrated in participant instructions; Relies on extrinsic motivation for meeting requirements; Micro-manages (not allowing others to demonstrate ownership); Is passive (refuses to demonstrate ownership) |
| Cultural Pressures | Many competing demands for one’s time; Accommodate a diverse set of participant abilities at minimum cost; Efficiency (e.g., scantrons are easier to grade than essay responses) |
| Student Example | Anita is extremely busy and feels that she just doesn’t have time to decide what is and isn’t important. It is a huge relief to her that her chemistry lab course clearly and explicitly defines all assignments in a step-by-step way, and describes exactly what the format, contents, and length of her post-lab analysis must be. She appreciates that she doesn’t have to spend time thinking about these things, but only needs to follow directions. |
| Faculty Example | Dr. Smith just received her second e-mail reminder from her dean about her upcoming annual review. She is pleased to see that he has included a checklist of items he expects to see in her portfolio; who has time to keep track of all those hoops you’re expected to jump through? |

### TIPS FOR MOVING FROM RED TO GREEN

- **Ask for an explicit commitment to hard work, cooperation, and quality results at the beginning of each learning experience.**
- **Assign students to heterogeneous teams when diverse skills are needed to tackle difficult learning challenges.**
- **When redesigning courses, consider using a set of guided inquiry activities that ultimately lead to a meaningful open-ended project.**

| Characteristics | Demonstrates initiative and persistence without prompting; Often moves in unanticipated, but fruitful directions; Believes that resources should be independently identified and accessed; Displays self-monitoring and self-regulation; Has high or increasing level of self-awareness; Is intrinsically motivated to learn and is a self-grower; Actively engages with others and with situations |
| Cultural Pressures | Prioritize activities by long-term importance; Learning as its own reward: Lifelong learning; Empowering self and others; “Standing on one’s own two feet” |
| Student Example | When he confronts problems in his computer drafting class, Cam always browses the help system and the quick reference cards posted on the course website; he also looks for ideas or solutions on a few internet forums he’s found before going to see his professor during office hours. |
| Faculty Example | Dr. Young updates his resume and teaching portfolio, as needed, at the end of each semester. He also spends a day, each year, reviewing his portfolio and assessing his progress against a formal list of professional goals he has identified. “I know it might seem a little…I don’t know…‘obsessive?’ But it’s not about scrambling up a career ladder or meeting someone else’s expectations…this is about reminding myself why I do what I do, and that I’m ultimately the person in charge of where I go in my life.” |

### Related Modules

- Getting Student Buy-In
- Process-Oriented Guided-Inquiry Learning
- Problem-Based Learning
- Self-Growth Plans for Faculty Members
### Characteristics
Values objectivity; Believes that thinking is more important than feeling (emotions are transient and irrational); Sees learning as a cognitive operation

### Cultural Pressures
Dispassion is a hallmark of credibility; Education represents the triumph of reason over emotion (the mind over the heart); Emotions are things to be controlled and never indulged (or even noticed); Emotional reactions are unseemly, and grown-ups know that there’s a time and place for emotions (and the classroom isn’t one of them)

### Student Example
Kyle is having a difficult time with his home situation, and despite his best efforts, it is really starting to take a toll on his coursework. He met with his instructor to explore options about the classes he fears he will have to miss. “I’m probably going to have to move; it’s not a very good setup right now. I was hoping that I could do some extra work to make up for missing class; I’m really in a bad position and can’t promise I can make all the classes.” He met with his instructor. “She listened for a few minutes then put her hand up and said that it wasn’t her business or problem. She told me that I needed to get my priorities straight. It was pretty harsh, but I guess I get it; she doesn’t get paid to care about anything outside of class.”

### Faculty Example
Professor Malin believes strongly that the personal life of her students is their own business. “They need to learn to cope with the fact that life can be difficult,” she says, “If they can’t, maybe they shouldn’t try to pile my class on top of everything else. I am not offended if students decide they need to drop my class.” As she filled out Kyle’s drop card, she thought, “I know he was having issues but they were his issues and had nothing to do with my class.”

### TIPS FOR MOVING FROM RED TO GREEN
Avoid projecting personal fears and performance anxieties on your students. During routine interactions/interventions ask inquiry questions that provide insight about personal background, opinions, and desires. Connect authentic student desires with performance challenges.

### Characteristics
Able to see current performance in the context of personal situations and backgrounds; Projection of positive feeling towards all learners no matter what their background or past performance

### Cultural Pressures
Whole person; Students and instructors are complete individuals with social and emotional dimensions; Coaching for success; Emotional Intelligence; A well-balanced person; Importance is placed on empathy in creating well-rounded individuals

### Student Example
Lauren was blown away when she received an e-mail from her political science instructor. He had noticed that she had missed three classes in a row. That his e-mail expressed concern rather than anger or a warning made her realize that it meant something to him whether or not she was ok and not just that she wasn’t in class. “I can’t believe it. I mean I know he knew my name, but I had no idea it actually mattered to him whether or not I was there. I haven’t been doing very well lately and even just knowing that I’m not invisible is really something. But this was more than that. He cares.”

### Faculty Example
Sean is acutely aware that for some of his students, feeling and knowing that someone is in their corner can make all the difference. When their life issues get in the way of their learning, he offers his time and energy, and has accompanied more than one student to the campus counseling center. His motto is, “I’m not teaching English, I’m teaching people.”

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**Related Modules**
- 2.3.5 Social Domain
- 2.3.6 Affective Domain
- 3.1.4 Establishing Initial Respect without Prejudging
- 3.1.8 Letting Students Fail So They Can Succeed
- 4.2.1 Overview of Mentoring
### Characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Pursues the acquisition of knowledge and skills that are narrowly contextual; Tends to be content-focused or discipline-focused</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultural Pressures</td>
<td>Preparation for further and increasingly narrow coursework; Publish or perish; Increasing specialization within disciplines; Expertise; Drills and memorization</td>
</tr>
<tr>
<td>Student Example</td>
<td>Sam is intensely relieved that he is finally finished with his English requirements. “Whew! I’m SO glad that’s done. I’m a math major, for heaven’s sake! Why on earth do I need to know how to write a topic sentence, analyze an essay, or be familiar with the works of Tennyson and Wordsworth??”</td>
</tr>
<tr>
<td>Faculty Example</td>
<td>In reviewing tenure packets, Dr. Smith likes to see at least one publication per year in a recognized, refereed journal that features research within a disciplinary sub-specialty. That few other faculty read or respond to the research isn’t the point; the passion for becoming an acknowledged expert in one area is.</td>
</tr>
</tbody>
</table>

### TIPS FOR MOVING FROM RED TO GREEN

| Pursue diverse learning outcomes that feature movement areas and experiences beyond context-specific competencies. | Intervene on learning skills rather than difficulties with content. | Regularly assess process elements as well as content elements. |

### Characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Pursues the growth of knowledge and skills that are applicable across different contexts; Tends to be process-oriented; Is aware of patterns, similarities, commonality, and basic principles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultural Pressures</td>
<td>Large problems that are inherently interdisciplinary; Multiple employers and roles within one’s career; Rapid development of new technologies; The importance of adaptation to fluid situations and flexibility; Writing across the curriculum; “Renaissance thinker”; “Well-rounded individuals.”</td>
</tr>
<tr>
<td>Student Example</td>
<td>When George was filling out his application to law school, he considered that the political science courses he took were necessary but that the critical thinking skills he gained in his philosophy courses would not only help him survive law school, but also be a successful law professional.</td>
</tr>
<tr>
<td>Faculty Example</td>
<td>Each year the dean’s office conducts surveys of faculty and students, and packages attractive and successful offerings for under-division and upper-division students. When a popular course was under threat due to funding concerns, the dean was able to secure a commitment from multiple departments to have it cross-listed. He suggested an interdisciplinary teaching team based on what he’d read about a similar course at another school, and the response he has received so far is enthusiastic and very promising.</td>
</tr>
</tbody>
</table>

### Related Modules

- 1.5.4 Writing Performance Criteria for a Program
- 2.3.3 Classification of Learning Skills
- 2.4.3 Development and Use of an Expert Profile
- 2.4.5 Learning Outcomes
- 2.4.9 Writing Performance Criteria for a Course
## Self-Awareness

The degree to which reflective and self-assessment practices are used by the individual to foster the growth of his or her learning skills across the cognitive, affective, and social domains.

### Characteristics

| “Do what you’re told”; Believes learning is a mystery; Is unaware of emotional or social “rules”; Acts out; Rationalizes behavior; Is task-oriented, blind to self, reactive, selfish, narcissistic, unable/unwilling to work with others, incurious, and self-satisfied |
| Cultural Pressures |
| Bosses know best; Experts think for you; Not enough time and too much to cover or to do; Focus on the now; “Go with your gut”; “Be yourself” |
| Student Example |
| Tori is really angry. “We had this quiz in psych class, right? And I didn’t do the reading because I had better things to do and I hate this class anyway. But when Professor Zahdi returned our quizzes, he had written at the top of mine that I needed to consider why I often make the choice not to do the reading and had I thought though the potential relevance of what we’re learning with respect to my apathy. I was like, ‘How dare you!’ Who does he think he is??” |
| Faculty Example |
| Bob is exasperated with the increasing number of complaints he gets from students every semester. “I’ve been teaching for 27 years. I can’t believe they think I’d even consider some of their ‘suggestions.’ I finally lost it last week when one of them asked if we could spend class time reviewing material we’ve already covered. I told them to expect a quiz every class meeting until the final.” His best friend Sam asks if maybe there’s something to any of the complaints. Bob shakes his head, “If they think they’re unhappy now, just wait until I really turn up the heat.” |

### TIPS FOR MOVING FROM RED TO GREEN

| Ask reflective questions to encourage the self-exploration of values and behaviors. |
| Model the use of self-assessment for students and encourage its use. |
| Use learning activities and situations that build learning skills from all domains. |

### Characteristics

| “Learning how to learn”; Steps back from doing; Self-assesses; Questions actions; Is proactive, open to feedback and constructive criticism; Seeks self-knowledge and self-actualization; Desires increased metacognition, self-discipline, self-mentoring, self-development |
| Cultural Pressures |
| Self-help and self-improvement; Emotional intelligence; “Know thyself”; Emotional regulation (anger management, coping with stress, etc.); “Think before you speak”; Mindfulness |
| Student Example |
| Letty got her Psych100 quiz back with the following note at the top: “It is obvious you did the reading but also that you’re trying to memorize rather than understand the material. Are you sure this is the most successful strategy you could use?” That stung a little bit but she reserved judgment until she had some time to think about it. “I didn’t want to admit it at first but he’s right. I have been trying to just absorb ideas without really considering how they fit together. That really isn’t working for me and ‘cramming’ information usually just makes me feel more confused. I really do need to change my strategy.” |
| Faculty Example |
| Dr. Whetten, like most faculty, has concerns about the usefulness of student evaluations. “You know though…one thing they do give me is the opportunity to consider and reconsider what and how I’m doing in the classroom. When I see patterns in student feedback, it prompts me to reflect and honestly assess myself. A couple of students last year noted that I seem ‘aloof’ or ‘distant.’ That was a shock because I tend to think of myself as personable. But as I thought about it, I realized that when I get frustrated or stressed, I do tend to be a bit distant. I see now that I do that with family and friends too. I’m working on this as a priority!” |

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1.4.5 Performance Levels for Learners & Self-Growers  
1.4.9 Turning Evaluation into Assessment  
2.2.7 Understanding Motivation and Self-Regulation Theories  
2.3.6 Affective Domain  
2.3.7 Learning Processes Through the use of Methodologies  
4.2.2 Becoming a Self-Grower
### SOCIAL ORIENTATION

The investment, interdependence, and responsibility for learning throughout a community

<table>
<thead>
<tr>
<th>HISTORICAL TENDENCY</th>
<th>INDIVIDUAL</th>
<th>COLLABORATIVE</th>
<th>COMMUNITY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Characteristics</strong></td>
<td>Values self-sufficiency and individual responsibility above interdependence and shared accountability; Identifies collaborative groups with bureaucracy (believes that collaboration is inefficient)</td>
<td>Capitalism and competition; Individualism (Objectivism); Heroes (the distinctive person with worthy accomplishment); “Survival of the fittest”; “Looking out for number one”; “Protestant work ethic” (salvation is an individual enterprise)</td>
<td>Values interdependence and shared accountability above individualism; Demonstrates appreciation for cooperation, teamwork, flexibility, and synergy</td>
</tr>
<tr>
<td><strong>Cultural Pressures</strong></td>
<td>Enrique is a fairly strong performer who prefers to work alone. He gets extremely frustrated in his biology lab because the experiments are team-based. “I can usually get things on my own; waiting for other people to catch up gets old really fast. And what if one of them gets sick and misses lab? That just means that the rest of us have to do extra work.”</td>
<td>Dr. Hall doesn’t use collaborative learning in her classroom. “I tried a group activity once and the sheer volume of the class was astounding. You’d think these kids are old enough to be beyond gossiping and visiting…” She is also fond of quoting Mark Twain on committees – that their intelligence is in inverse proportion to their number of members. (Dr. Hall is also thrilled to have finished her turn on Faculty Senate.)</td>
<td>Gillian is a fairly strong performer who is a member of Enrique’s bio lab team. She enjoys being part of the team because everyone, even Enrique, has ideas they share. She says, “Yeah, Enrique gets irritated but the additional input and experience of others on our team is wonderful; it’s something I wouldn’t get if I were working alone. Besides, if I do go into medical research, I need to be ready and able to work as part of many different teams.”</td>
</tr>
<tr>
<td><strong>Student Example</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Faculty Example</strong></td>
<td></td>
<td></td>
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</tbody>
</table>

#### TIPS FOR MOVING FROM RED TO GREEN

| | Have students assess one another’s individual work. The boost of another identifying strengths as well as helping with improvement makes collaboration more attractive. | The use of formal team roles can help bridge the gap between individual efforts and team results. | Allowing teams to compete shifts competition/identity from an individual to the group. Shared win = celebration; shared loss = commiseration. |

---

3.1.6 Obtaining Shared Commitment  
3.3.2 Cooperative Learning  
3.3.8 Interdisciplinary Team Teaching  
3.4.2 Designing Teams and Assigning Roles  
3.4.3 Teamwork Methodology
### Characteristics

<table>
<thead>
<tr>
<th>Fears judgment; Is a perfectionist; Believes that preparation and practice must come before any demonstrated performance; Sees outstanding performances as highly controlled and scripted; Has a high affective filter (evidences fear, alienation, isolation, discomfort)</th>
</tr>
</thead>
</table>

### Cultural Pressures

<table>
<thead>
<tr>
<th>Belief that while success should be public, failure should be private; Pervasive fears of things like public speaking; “Hide your dirty laundry”; Promote only successes</th>
</tr>
</thead>
</table>

### Student Example

<table>
<thead>
<tr>
<th>Rogelio won’t share the draft version of his papers with others, though his professor encourages students to take advantage of the helpful feedback others can give. He hates looking stupid and knows that the paper is not ready for an audience yet; they can read it when it’s finished and he’s fixed all the mistakes.</th>
</tr>
</thead>
</table>

### Faculty Example

<table>
<thead>
<tr>
<th>Though Dr. Apfel agrees that using an Internet forum for departmental discussions is one way to allow for increased collaboration, he’s simply not comfortable with the informal and open nature of the media. He really prefers to reach out to individuals by phone or e-mail, engaging on his terms.</th>
</tr>
</thead>
</table>

### TIPS FOR MOVING FROM RED TO GREEN

| Whenever possible, stress an assessment mindset rather than an evaluation mindset. | Use peer assessment (where the performance of peer individuals and teams are assessed) so that both assessors and assessees grow through the interaction which also serves to make private performance more public. | There is a perception of “safety in numbers”; when students are extremely shy or fearful, allowing them to perform as part of a team can be a strong first step. |

### Characteristics

<table>
<thead>
<tr>
<th>Is willing to model desired behaviors; Trusts in self and others; Prefers a collaborative or supportive environment; Is willing to innovate and improvise; Has a lowered affective filter (evidences humor, identification, comfort)</th>
</tr>
</thead>
</table>

### Cultural Pressures

<table>
<thead>
<tr>
<th>Risk-taking as a source of value; Entrepreneurial spirit; Immediate feedback with opportunity to pursue just-in-time improvements</th>
</tr>
</thead>
</table>

### Student Example

<table>
<thead>
<tr>
<th>It took some time (and lot of courage) but Karyn knew that being willing and able to share her insights on topics they were learning was important, and not just for the class participation part of her grade. Being willing to speak up during class discussions made her realize that she had a lot to contribute. When other students nodded appreciatively at some of the points she raised, it felt really great!</th>
</tr>
</thead>
</table>

### Faculty Example

<table>
<thead>
<tr>
<th>Jeff was recently invited to participate in a roundtable discussion at an international conference. His department chair asked if he was nervous, since the proceedings would be broadcast online and the issues and questions raised during the roundtable session tended to be entertainingly off-the-cuff. “Are you kidding, Stan? I know it has a reputation as something of an intellectual mosh pit but who wouldn’t throw themselves at the chance to engage with those folks? It’s going to be a lot of fun. Record it for me; if nothing else, we can sell the DVD to raise funds for the department. I know my students would get a kick out of owning it.”</th>
</tr>
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</table>
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International Journal of Process Education

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The *International Journal of Process Education* will be a catalyst for the scholarship of teaching and learning in support of the efforts of the Academy of Process Educators to transform higher education.

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To provide a forum for, and an archival record of, scholarly research in *Process Education*.
To elevate skills in the discipline of the scholarship of teaching and learning.
To explore promising new research areas in *Process Education*.
To foster classroom-based research.

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International Journal of Process Education

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Process Education is a performance-based philosophy of education which integrates many different educational theories, processes, and tools in emphasizing the continuous development of learning skills through the use of assessment principles in order to produce learner self-development.