Chapter Four: Analysis of Results for the Outcomes Assessment Plan

This chapter will explain methods for analyzing data collected via the outcomes Assessment Plan described in Chapter Three. Specifically, this chapter will provide information about what to look for in data, how to develop possible reasons for the findings (hypotheses), how to determine whether a change should be made, and briefly discuss the implementation of change.

While the unit of study in the tables used in Chapter Three was indicator, for analysis purposes the unit of study includes not only indicators but also Expected Program Outcomes. One way to think about Expected Program Outcomes and their associated indicators is that the weight of the evidence from the individual indicators will yield information for the associated Expected Program Outcome. The approaches to analysis of results presented here are broad enough to be used for both indicators and Expected Program Outcomes. Each person or group listed in the Assessment Plan (Column E) for each indicator (Column A) should analyze findings using professional judgment and expertise, and then document how data analysis was accomplished. The Assessment Team should conduct—and be responsible for—similar analyses of results for the associated Expected Program Outcomes.

Making Sense of Collected Data (Table 2, Column I)

The analysis of data will vary depending on the nature and volume of data collected. The first step is to identify/sort which data are important to examine relative to the specific indicators and Expected Program Outcome under investigation. Analysis methods will vary depending on the type of data. Quantitative information can often be presented in graphic or tabular form, including frequencies or averages. Data such as examination pass rates, graduation or attrition rates, scores on the Clinical Performance Instrument (CPI), number of books in the library, grants received by physical therapy education faculty, equipment purchased, or square footage of space can all be expressed numerically. Qualitative data may need to be accumulated in narrative form for analysis. For example: Surveys of employers or focus groups may provide comments that reflect the competence of graduates; faculty involvement in scholarship may require description of research agendas and activities; programs may offer continuing education to improve clinical instructor performance; and observation may provide data to demonstrate its effectiveness. Such qualitative descriptors can be rich in substance for understanding the success or value of program activities.

Recall that the analysis of assessment results in the suggested outcomes assessment process described in this document is similar to pattern analysis and interpretation that Donabedian included in his quality assurance monitoring cycle for health care (See Appendix A). Once data and evidence have been identified for inclusion in the review for a specific indicator or Expected Program Outcome, analysis should include:

- Identification of “red flags,” or areas that require action. There may be two kinds of red flags: pre-identified and emergent.
  - Pre-identified red flag—not meeting an identified target and/or threshold (already documented as Column H and described in Chapter Three)
• Emergent red flag—unexpected consequences or outcomes such as feedback from employers about inappropriate professional behaviors by students.

• Identification of patterns in data (triangulate within and among data sources). When findings are consistent across sources, repetitive over time, or there are multiple indicators about a single subject area, the importance of those findings increases, as does the need to evaluate them more carefully. Consider the:
  • source of data (findings are consistent across more than one stakeholder group, eg, students, employers, patients, a faculty);
  • data collection method (findings are consistent across more than one collection method, eg, survey, test data, etc);
  • time trends (eg, whether this is the first time the finding has been identified or it has been seen previously); and
  • multiple red flags by category (student/graduates, faculty, and/or program).

• Anticipation of potential problems based on findings. These may be issues that faculty are curious or concerned about based on personal observation, changes in the profession or health care system, etc. This information may inform future changes in the Assessment Plan.

• Scanning of entries to identify areas of need (many instances of not meeting the threshold in Column H).

Table 2 diagrams a process for developing an action plan to address problems found from data analysis described in this chapter. The Assessment Team (or designated person or group) should enter information about whether action is needed on each Expected Program Outcome in Column I.

**Table 2. Identified Hypotheses**

<table>
<thead>
<tr>
<th>Program Goal: Graduates will demonstrate the skills necessary for the entry-level practice of physical therapy.</th>
<th>Expected Program Outcome: Students/graduates will communicate with various constituents in a manner that reflects their level of knowledge, considers health literacy, is sensitive to cultural issues, and demonstrates respect.</th>
<th>Relevant Institutional Goal: Create an outstanding student experience that promotes personal and intellectual development.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Column I</strong></td>
<td><strong>Column J</strong></td>
<td><strong>Link with Table 3, Specific Action Plan</strong></td>
</tr>
<tr>
<td>Link with Table 1, Assessment Plan</td>
<td>Analysis of data collected for expected program outcome.</td>
<td>Hypothesis? (possible causes or reasons for the findings)</td>
</tr>
<tr>
<td>This is the first time the threshold was not achieved for this assessment tool; students have not had full time clinical education yet, so no CI or employer feedback for this group; Speech prerequisite dropped for this class in admissions process.</td>
<td>Students’ lack of experience with platform-presentation format (15 min. presentation/5 min. Q&amp;A).</td>
<td></td>
</tr>
</tbody>
</table>

**Formulation of Hypotheses (Table 2, Column J)**

Potential reasons for problem findings must now be identified. The Assessment Team should develop a hypothesis that possibly explains the reasons for the findings for each Expected Program Outcome, or put another way, why these data might show the trends, deficits, or mismatches for the Expected Program Outcome. Because multiple indicators and multiple data sources may be used for each Expected Program Outcome, the Assessment Team should take all of the data into account as it develops hypotheses. The Assessment Team (or others identified by the team to provide needed insights) must identify all possible explanations/theories (hypotheses) about why thresholds and/or goals have not been met for each relevant indicator, and overall what effect these deficits may have on the Expected Program Outcome to which they are linked. There can be multiple hypotheses that may potentially explain an area of concern; these multiple hypotheses may point to behaviors that need to be changed and actions that need to be taken by different stakeholder groups (eg, faculty, students, administrators, employers).
The Assessment Team should consider the following suggestions when formulating hypotheses for the Expected Program Outcome:

- Gather other available data and information to better understand the problem associated with an Expected Program Outcome.
- Use faculty judgment about the area of concern.
- Consult with colleagues in other programs on the same campus or at other institutions and discuss what changes were implemented in response to common areas of concern.

To develop possible explanations/theories—hypotheses—the Assessment Team should consider:

- The data collection method or instrument: Is there reason to believe that the data collection method or instrument is biased or inappropriate for investigation of the specific Expected Program Outcome? If the instrument is biased or inappropriate, findings should be used to modify the data collection method or instrument prior to the next assessment cycle.
- The weight of data and evidence collected: Hypotheses should be data driven and emerge from analysis of results; they should not be based on assumption or personal preference.

If data driven, the Assessment Team now has to determine which of many factors might be contributing to the findings and consider together all factors that may be operating. For example, if an indicator is licensing examination scores and the data indicate that the threshold has not been met, there are likely multiple factors that have contributed. Consider the following general factors that may influence findings:

- Structure (examples below are not exhaustive)
  - resources (faculty number/expertise, space, budget, learning resources, equipment, and materials)
  - admissions (prerequisite courses and other requirements)
  - organizational characteristics (public/private, policies/procedures, institutional hierarchy)
- Process (examples below are not exhaustive)
  - curriculum content
  - curriculum sequence
  - pedagogy
  - clinical education
  - faculty development
  - scholarship

Once possible reasons have been identified, the task is to determine which contributed to the findings. There are likely multiple contributing factors and the task is to identify those hypotheses that are most critical for each Expected Program Outcome based on available data.

Table 2 can be used as a template to record the various hypotheses (Column J) for each Expected Program Outcome.

**Change Based on Data-Driven Hypotheses**

At this point, the Assessment Team, individual, or group assigned has identified hypotheses to explain the findings for each Expected Program Outcome, or, in other words, the most likely causes for the findings. The Assessment Team will likely be the group that determines what changes need to be made and what to do about them. Table 3 provides a template for a Specific Action Plan. A Specific Action Plan should be developed for each hypothesis and a unique table created for documentation purposes.
Table 3. Specific Action Plan (one for each hypothesis generated)

**Program Goal:** Graduates will demonstrate the skills necessary for the entry-level practice of physical therapy.

**Expected Program Outcome:** Students/graduates will communicate with various constituents in a manner that reflects their level of knowledge, considers health literacy, is sensitive to cultural issues, and demonstrates respect.

**Hypothesis:** Students’ lack of experience with platform-presentation format (15 min. presentation/5 min. Q&A).

<table>
<thead>
<tr>
<th>Column K</th>
<th>Column L</th>
<th>Column M</th>
<th>Column N</th>
<th>Column O</th>
<th>Column P</th>
<th>Column Q</th>
<th>Column R</th>
<th>Column S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific action that constitutes the change (can be multiple actions)</td>
<td>Who are the change agents?</td>
<td>Time frame for implementation of the specific action</td>
<td>Who checks implementation of specific action(s)?</td>
<td>Timeframe for checking the results of the specific action</td>
<td>Determine the effectiveness of specific action</td>
<td>Institutionalize, revise, or discard specific action?</td>
<td>Communicate with appropriate stakeholders</td>
<td>Document specific actions</td>
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Lecture, discussion, and handout on elements of excellent platform presentations. Students required to have a graded presentation in Clinical Seminar course.

Prior to determining an action plan, the Assessment Team should consider the following:

- Does the hypothesis for the cause of a finding or the finding itself suggest that the quality of the physical therapy education program has been affected? If not, then consider taking no action at this time, however, also consider whether the finding might show up in future assessments. Documentation of all decisions is necessary.
- Is the hypothesized cause of a finding such that it is the Assessment Team’s professional judgment that action is not necessary or can be deferred? For instance, is the finding hypothesized to be an artifact of a college-wide or institutional policy change? If it is an artifact and no action is necessary, document the decision.

The remaining findings will require action. The Assessment Team determines the action to be taken based on the reasons for the findings, in consideration of:

- History of previous action about same issue/area of concern.
- Feasibility of possible changes in light of:
  - institutional/program mission,
  - available funding, and/or
  - faculty expertise.

Regardless of the source of the finding about which action has been deemed necessary (eg, the institution, program, faculty, students, etc), a Specific Action Plan should be developed outlining the corrective action that will be taken. The decisions made for action or inaction should be communicated to those individuals who will implement the decision as well as to stakeholders.
Determine specific action(s) needed based on the data-driven hypotheses. (Table 3a)

The next step is to determine specific actions to address the change. Actions may involve the efforts of different stakeholder groups. A collaborative discussion with those who will actually be implementing the actions—the change agents—will ensure better support. Changes may take several forms including formal and informal, and/or behavioral or policy changes. Furthermore, resources may need to be reallocated or newly allocated to achieve desired changes.

Table 3a. Specific Action Plan (one for each hypothesis generated) With Column K Highlighted

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Identify who/which group(s) will take specific action(s). (Table 3b)

The Assessment Team may choose to engage other stakeholders because they may provide useful input when determining a hypothesis or specific actions to take and because they may complement the knowledge and skills brought by Assessment Team members or simply because they will be implementing the change. The change agents are identified when the specific action(s) for change have been determined. Change agents in collaboration with the Assessment Team identify specific behavioral or policy actions that will be taken (see Table 3b). Change agents and the Assessment Team may need to advocate for either reallocation or new allocation of resources to assist in change implementation. These resources will vary depending on the expected action but may include additional time, money, space, personnel, and/or cooperation from other stakeholders. Change agents are responsible for implementing the specific action. If multiple actions are undertaken, different individuals or groups—different change agents—may be responsible for implementing the different actions. Recall that continuous improvement is about the program, not necessarily about specific faculty members’ performance; the latter may be addressed via the faculty assessment and development process.

Because these specific actions result from the outcomes assessment process of the program, the physical therapy education program collectively implements and therefore supports these decisions.
### Table 3b. Specific Action Plan (one for each hypothesis generated) With Column L Highlighted

**Program Goal:** Graduates will demonstrate the skills necessary for the entry-level practice of physical therapy.

**Expected Program Outcome:** Students/graduates will communicate with various constituents in a manner that reflects their level of knowledge, considers health literacy, is sensitive to cultural issues, and demonstrates respect.

**Hypothesis:** Students’ lack of experience with platform-presentation format (15 min. presentation/5 min. Q&A).

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<td>Lecture, discussion and handout on elements of excellent platform presentations. Students required to have a graded presentation in Clinical Seminar course.</td>
<td>Faculty member for Clinical Seminar course.</td>
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**Establish a timeframe for implementation of the specific action(s). (Table 3c)**

Change agents and Assessment Team members responsible for specific actions for change should agree on a reasonable timeframe that allows enough time for change to have an impact on the identified area of concern. However, excessive delay between implementation and checking (Column N) can limit the utility of feedback.

### Table 3c. Specific Action Plan (one for each hypothesis generated) With Column M Highlighted

**Program Goal:** Graduates will demonstrate the skills necessary for the entry-level practice of physical therapy.

**Expected Program Outcome:** Students/graduates will communicate with various constituents in a manner that reflects their level of knowledge, considers health literacy, is sensitive to cultural issues, and demonstrates respect.

**Hypothesis:** Students’ lack of experience with platform-presentation format (15 min. presentation/5 min. Q&A).

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<td>Lecture, discussion and handout on elements of excellent platform presentations. Students required to have a graded presentation in Clinical Seminar course.</td>
<td>Faculty member for Clinical Seminar course.</td>
<td>Next Fall semester</td>
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</table>
Summary

Chapter Four documents the methods to identify and implement changes needed to improve the program. Implementation of specific actions can be the hardest part of an outcomes assessment process. Successful implementation requires:

- **Involvement and engagement by all individuals affected by actions taken to improve the outcomes of the physical therapy education program.** This engagement is needed continually throughout the outcomes assessment process. As a result, change will be more easily accepted and potential resistance to changes will be diminished. Open communication throughout the outcomes assessment process will help individuals understand their roles and how their actions matter in terms of the physical therapy education program’s outcomes assessment process. It may be necessary and beneficial to explain and justify the need for change multiple times to avoid wasting scarce resources.

- **Availability of adequate resources to implement changes and specific actions.** Resources required to implement the change should be offered at a reasonable “cost” of time, talent, and finances to the physical therapy education program. Each program will have its own level of need for resources. Some physical therapy education programs may need templates of grading rubrics, for example, while others may need consultants.

- **Recognition by all stakeholders that there is likely to be a positive effect of the implemented changes on the program.** Each stakeholder associated with the program should recognize that the assessment plan and actions taken to improve outcomes are required so that continuous improvement of the program toward excellence can be made. This recognition will be facilitated by active participation by all stakeholders and by an Assessment Plan that is not tied to other policies such as tenure and promotion.

Assessment does not stop with implementation of actions designed to facilitate change. The outcomes assessment process—a quality assurance cycle—obliges the physical therapy education program to evaluate and provide a report about the consequences of specific actions. Chapter Five addresses some approaches to this feedback process.