Digital Badges and the Analysis of Learning and Educational Activity

Daniel Hickey
• Web-enabled tokens of accomplishments
  – Eight fields of information and an image
  – Mozilla foundation established the Open Badges Infrastructure (OBI)
• Can be accumulated internally or externally
  – Mozilla’s digital “backpack”
• Can be shared over email and social networks (not LinkedIn!)
• Contain specific claims about learning
• Contain evidence of learning
  – Links to more evidence
  – Digital artifacts
  – Rubics, peer comments, feedback, etc.
Example DML Badge System

Supporter to Reporter at digitalme

- digitalme is a collective of UK educational innovators
- Badge the UK is a big push to coordinate informal learning
- Makewaves/S2R medals was a DML 2012 Awardee
Teacher HQ
Help to make it happen

Channels
Help 15
Case Studies 11

Teacher Talk
Have your say on your new forum exclusively for teachers

What Will You Make?

This Term on Makewaves
Find out what’s happening this term that you and your students can get involved with...

The Essential Makewaves Knowledge
Hints & tips to make running your site easy!

Makewaves Badges

How to Make Badges
All you need to know about making Badges to award on Makewaves

Makewaves Badges
All you need to know about awarding and making badges on Makewaves

Make things your way with the Makebadges site
Design your own free badges, banners & avatars - perfect for Makewaves!

The Makewaves App!

The New Makewaves App
Created via the App

Using the Makewaves App in Schools
Beth Smith and Alan Crist discuss using the Makewaves App in schools

Resources and Activities - Get Involved!

Safe
Safe is a programme of practical activities to develop primary children’s skills, self-confidence and safety awareness when using social networking
Earn your S2R Bronze Journalist Medal

Create 3 sports reports and earn your S2R medal

Introducing the S2R Bronze Journalist Medal

To earn the S2R Bronze Journalist Medal you must create three sports reports of acceptable quality which are accepted into the S2R Medals channel. They need to be about sport, use appropriate language and contain text and images/video.

Youth Sport Trust 2013 Media Team

Awarded for reporting at Sainsbury's 2013 School Games with the youth media team.

What someone needs to do to earn this badge

Evidence

www.makewaves.es/story/569437

Issuer

Name: schoolgames
Site: https://www.makewaves.es/schoolgames

Interview With Hannah Cockroft MBE

Yesterday on Thursday 12th September, we spoke to Hannah Cockroft MBE

Our Interview:

At the VIP opening evening, we managed to get an inspirational interview with Hannah Cockroft MBE and she officially opened The Sainsbury's School Games 2013.

https://www.makewaves.es/story/569437/title/interviewWithHannahCockroftMBE
Digital Youth Network
Chicago Summer of Learning

BADGES FOR LEARNING: A DESIGN FRAMEWORK

Design badges that enhance learning and empower your participants.

Why badges?
Badges have the potential to radically shift how learning experiences are assessed, shared, and recognized. The Chicago-based Digital Youth Network (DYN) has developed a framework that connects badges to a set of learning experiences, which can also gain recognition through interest-driven learning in a social community to create a more coherent path to discovery.

Badges can:
- Allow individuals to receive recognition for skills and achievements gained through a variety of experiences.
- Provide a bridge between informal learning opportunities and formal environments.
- Increase the visibility of potential pathways for learning and exploring new skills and interests.
- Provide the motivation to explore in new ways and be recognized in the community.
- Build a community that represents who they are and what they can do.

Badge Types

<table>
<thead>
<tr>
<th>Badge Type</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Community</td>
<td>Recognize specific attributes or behaviors that are recognized by the community.</td>
</tr>
<tr>
<td>Skill</td>
<td>Recognize specific skills and competencies that are valued by the community.</td>
</tr>
<tr>
<td>Showcase</td>
<td>Recognize specific achievements that are valued by the community.</td>
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</tbody>
</table>

Examples:
- **Community**: Recognize specific skills and competencies that are valued by the community.
- **Skill**: Recognize specific skills and competencies that are valued by the community.
- **Showcase**: Recognize specific achievements that are valued by the community.

Challenges completed

Tell Us Why You Are Here: Citizen Science
- What is your favorite medium? (New)
- What is your favorite medium? (New)
- What is your favorite medium? (New)
- What is your favorite medium? (New)
- What is your favorite medium? (New)

Help scientists classify their data
- What is your favorite medium? (New)
- What is your favorite medium? (New)
- What is your favorite medium? (New)
- What is your favorite medium? (New)
- What is your favorite medium? (New)

Citizen as Scientist
- What is your favorite medium? (New)
- What is your favorite medium? (New)
- What is your favorite medium? (New)
- What is your favorite medium? (New)
- What is your favorite medium? (New)

Visual Evidence
- What is your favorite medium? (New)
- What is your favorite medium? (New)
- What is your favorite medium? (New)
- What is your favorite medium? (New)
- What is your favorite medium? (New)

Digital Music
- What is your favorite medium? (New)
- What is your favorite medium? (New)
- What is your favorite medium? (New)
- What is your favorite medium? (New)
- What is your favorite medium? (New)

Digital Author
- What is your favorite medium? (New)
- What is your favorite medium? (New)
- What is your favorite medium? (New)
- What is your favorite medium? (New)
- What is your favorite medium? (New)

Other Examples of Community Badges:
- Network Node
- Project Collaborator
- Resource Provider

Other Examples of Skill Badges:
- Digital Publishing
- Software Design
- Game Design

Other Examples of Showcase Badges:
- Digital Publishing
- Software Design
- Game Design

Challenge Resources
- Activity: Choose a project that you are interested in and work on it.
- Activity: Choose a project that you are interested in and work on it.
- Activity: Choose a project that you are interested in and work on it.
- Activity: Choose a project that you are interested in and work on it.
- Activity: Choose a project that you are interested in and work on it.

How to complete your Badges?
- Choose a project that you are interested in and work on it.
- Choose a project that you are interested in and work on it.
- Choose a project that you are interested in and work on it.
- Choose a project that you are interested in and work on it.
- Choose a project that you are interested in and work on it.
Example Non-DML Badges Ecosystem

Educational Assessment BOOC

- Twelve weeks in Google Course Builder
  - Personalization via aim & role
  - Work in professional networking groups
  - Textbook and weekly wikifolios
- Three *Expertise* badges
  - Assessment *Practices*
  - Assessment *Principles*
  - Assessment *Policies*
- One Assessment *Expert* badge for earning the three expertise badges
- Most promotions in each group earns *Leader* badges
- Began with 460 registrants
  - Now around 80 active
  - Include 8 enrolled for credit
Reflection (By November 3)

A. Consequential Engagement: This was by far the most interesting and relevant unit to me so far. As a result of what I learned this week, I definitely plan to learn more about, and practice more, the art of learning progressions because I see them as an incredibly powerful tool to structure and direct instruction. I also plan to do more research about specific formative assessment strategies that are effective in the classroom.

B. Critical Engagement: I found my role and curricular aim very well suited to this week's concepts and big ideas. Not only was I able to see how my curricular aim could be reached via a learning progression, but I was also able to reflect on how to use formative assessment to make real time instructional adjustments, which is something I have seen in my consulting work that not a lot of teachers know how to do. Therefore, I can see how becoming somewhat of an expert on this topic could really help me in my work to add value and improve learning outcomes for many students.

C. As usual, [Name]'s work was insightful because as a classroom teacher, she is able to bring a very practical perspective to all of the concepts surrounding formative assessment. Her learning progression was very clear and really helped me to see that formative assessment does not have to be a complicated or difficult task for a teacher. I also learned a great deal from Patricia Tylka's work, particularly her observations about the importance of the right kind of feedback and her definition of formative assessment that uses a medical analogy. I also appreciated the Illinois resources on formative assessment that Patricia shared.

Endorse and Promote

This page has been endorsed as complete by [Name], Adjunct college instructor, retired h.s. English teacher, Librarian, and Elementary Educ.

You can promote this page as exemplary!

This is great because...

You can endorse that the author has completed the required elements, or the required AND optional elements of the assignment.

★ Exemplary

This page has been promoted as exemplary by [Name], Adjunct college instructor, retired h.s. English teacher, and Librarian.

Show reasons...
Mozilla Backpack

You are about to send 1 badge to your Mozilla Backpack at beta.openbadges.org.

Mozilla Backpack

My Collections
Organize badges the way you want

Professional Badges

New Display Name
This is the name that others see on the website.

New Name for Badges and Certificates

Change Badge Name

Badges

Collections
danielthickey@gmail.com

Newly Added

Dan Hickey

Dan Hickey shared a link.
October 23

Check out our awesome new badges from the Educational Assessment BOOC. Our programmer Thomas Smith built a brilliant interface and Garrett Poortinga created some attention-grabbing graphics, but the coolest thing is the way Thomas was abl... See More

Badge Evidence - Educational Assessment: Practices, Principles, and Policies
booc-slage.appunt.com

Badge Evidence Settings for Assessment Practices

Show my Wikifolio entries for this badge on the evidence page?

Save
I am currently taking Dr. Hickey's Educational Assessment BOOC, and was surprised at how excited I was when my badge was issued. I immediately shared it with my family members, and in particular those who are educators. Two days later, my aunt who is a tech integration specialist at a school district in VT posted her own badge she had earned by participating in a Connected Educators activity; she claimed she had to do it in order to keep up with me. I have also used them a handful of times with my own students in the Edmodo software system, and students have indicated that they want to get more badges.
The Design Principles Documentation Project

- 2012 DML Badges Competition
- 600 badge content proposals
- 3 platforms supported
- 30 content developers support
Regardless of where you start, it is likely you will end up somewhere other than your intended destination. That’s okay. Systems are living things and your system needs to be flexible. You need to embrace a bit of chaos in its design.

--Carla Casilli

Most of the knowledge generated when designing complex systems evaporates as features evolve and team dissolve.

--Phillipe Kruchten
Overview of Methods

• Reviewed 30 proposals for intended practice
• 2013 interviews identified enacted practices.
  – Sorted practices into design principles.
• Now linking principles to relevant research
  – Drafting detailed report.
• 2014 interviews to identify formal practices
  – Practices that endure after funding expires
• Creating working examples and website to share and discuss
• Will write and publish reports and review papers.
Categories of Badge Functions

• **Recognizing Learning**
  – *Skills, achievements, experiences, & practices*
  – *Individual, peer, social*

• **Assessing Learning**
  – *Summative, formative, transformative, & transcendent*

• **Motivating Learning**
  – *Intrinsic, extrinsic, & participatory*

• **Studying Learning**
  – Research of, for, & with digital badges
Evolution of Badge Design Practices

**Intended Practices**
- Ideas outlined in original proposal

**Enacted Practices**
- Intentions unfolding in world

**Formal Practices**
- Practices endure after funding ends
Emergence of Badge Design *Principles*

**Draft Initial Principles**
- Similar practices across different projects
- Aiming for 4-6 principles for each function

**Formalize General Principles**
- Exemplified by specific projects
- Highlights intersection of principle with context

**Bookmark Research**
- Find *relevant* research for each principle
- Encourages spread systematic inquiry
Principles for Recognizing Learning
(Ordered by Prevalence)

1. Use badges to map learning trajectories. Most used badges to organize learning by determining levels of badges or offering meta-badges.

2. Align badges to standards. Many used national or international standards to increase external value.

3. Have experts issue badges. Experts increase credibility; influences the usefulness beyond the issuing community.

4. Seek external backing. Increases usefulness as name recognition is important to schools and employers.

5. Recognize diverse learning. Broad recognition helps legitimize what would otherwise only be implicitly noticed.

6. Use badges to externally communicate accomplishment. Take advantage of unprecedented opportunity to present evidence and links to evidence of learning.

7. Make badges permanent. Provide permanent evidence that will be accessible forever.

8. Recognize educator learning. Badges have unique potential in this regard, often along side issuing them to learners.

9. Award formal academic credit for badges. While rare, a very consequential function of digital badges.
Principles for Assessing Learning (Ordered by Prevalence)

1. **Use leveled badge systems.** Most used sequences or structures to convey a progression or stages of learning.

2. **Enhance validity with expert judgment.** Many used human experts from the field or teachers, or use computer scoring.

3. **Align assessment activities to standards: Create measurable learning objectives.** Many state, national, or internal standards.

4. **Use performance assessment.** Many used open-ended and performance-based assessment methods.

5. **Use e-portfolios.** Some projects used e-portfolios that ranged in sophistication.

6. **Use formative functions of assessment.** Some made explicit efforts to provide formative feedback to directly advance learning following assessment.

7. **Use mastery learning.** Some projects’ goals for learners involve mastering specific skills.

8. **Use rubrics.** Some projects create their own rubrics while others use rubrics created by schools, districts, states, or organizations.

9. **Promote "hard" and "soft" skill sets.** Some projects distinguished between more specific individual skills and more social practices.

10. **Involve students at a granular level.** A few projects have decided to involve their community in the design and assessment processes.
Sub-Principles for ASSESSING Learning

• Use Leveled Badge Systems
  – Competency levels (10)
  – Meta-badges (8)
  – Hierarchy of badges (3)
• Enhance Validity with Expert Judgment
  – Use AI Tutors (1)
  – Use computer scoring systems (2)
  – Use experts (9)
  – Use computers and experts (11)
  – Give experts badges (3)
• Use Performance Assessments (4)
• Involve Students in Learning Pathway Design (3)
• Use Mastery Learning
  – Judged by computers
  – Judged by Humans and computers
• Align to Standards
  – Internal (7)
  – National/State (6)
  – Common Core (8)
• Use e-Portfolios
  – Open to public (2)
  – Local to community (5)
  – Foster discussion artifacts (5)
• Provide Formative Feedback
  – Peer feedback (4)
  – Expert feedback (1)
  – Peer & expert feedback (5)
• Recognize Educator Learning (7)
• Use Rubrics
  – Specific to artifact or assessment ((11)
  – Generic rubrics (2)
• Combine Hard/Soft and Collaborative/Individual (11)
Principles for *Motivating* Learning (Ordered Coherently)

**Provide privileges.** Learners receive privileges upon earning badges.

**Recognize identities.** Badges are awarded to recognize learners’ identities within the program.

**Engage with communities.** Badges are awarded to learners who engage with their community.

**Display badges to the public.** Badges are displayed to the public either automatically or by choice.

**Give value outside of badges.** Badges are recognized by outside agencies as academic credit, or for the skills that the badges themselves represent.

**Set goals.** Help learners set goals and visualize their accomplishment.

**Support collaboration.** Some badges are awarded for group accomplishments or to individuals for having a role in group collaboration.

**Foster Competition.** Scarcity and point systems create competition.

**Evolve new requirements for badges.** Requirements for earning the same badge change.

**Recognize different outcomes.** Badges recognize different skill sets.
<table>
<thead>
<tr>
<th>Using Conventional Evidence</th>
<th>Using Evidence from Badges</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Research OF badges:</strong> Summatively study impact of badges.</td>
<td><strong>Research WITH &amp; OF badges:</strong> Use evidence summatively to study impact of badges.</td>
</tr>
<tr>
<td><strong>Research FOR badges:</strong> Formatively improve learning with badges.</td>
<td><strong>Research WITH &amp; FOR badges:</strong> Use evidence formatively to improve learning.</td>
</tr>
<tr>
<td><strong>Research FOR ecosystems:</strong> Systematically improve learning systems with badges.</td>
<td><strong>Research WITH badges &amp; FOR ecosystems:</strong> Use evidence systemically to improve ecosystem</td>
</tr>
</tbody>
</table>
Badge Research Design Examples

• Research OF badges
  – Katie Davis’s PASA study
  – Jan Plass’ study of gameplay with and without badges
  – Sam Abramovich’s study of robotics

• Research FOR badges
  – James Diamond’s WBA study

• Research FOR Ecosystems
  – Barry Joseph’s Global Kids Summer Badge Pilot

• Research WITH & OF badges
  – Mapping NOAA to CCSS @ GoGoLabs by Lisa Dawley

• Research WITH & FOR badges
  – Mapping learning trajectories in Global Kids Summer Badge Pilot

• Research WITH & FOR ecosystems
  – Mapping pathways for different programs through DYN’s trajectories in CSOL
Badge Design & Research Challenges

ECOSYSTEM CONTEXT
- Goals, resources, audience, setting, etc.

RECOGNITION PRACTICES
- Formal vs. Informal
- Vs. Crowdsourced

ASSESSMENT PRACTICES
- Summative vs. Formative
- vs. Transcendent

MOTIVATION PRACTICES
- Intrinsic vs. Extrinsic
- vs. Cultural

RESEARCH DESIGNS
- OF badges vs. FOR badges
- vs. FOR ecosystems
- Versus
- WITH & OF badges vs. WITH & FOR badges
- vs. WITH & FOR ecosystems
Building a Badges Knowledge Network

Assessment Principles

Badges for Learning at S2R (Supporter To Reporter)

2. Align badges to standards
The Transcendent Potential of Badges

By Dan Hickey

In previous posts at HASTAC and Remediating Assessment I argued that we need to look beyond the intended purposes of digital badges and consider the actual functions of badges. This builds on what Jim Greeno has convinced me what happens when situative views of knowing and learning are applied to assessment. A later post elaborated on the summative, formative, and transformative functions of digital badges. That later post also promised a subsequent post on what we might call transcendent functions. I had written some about it in the original version but it was too long and I really could not wrap my head around it at the time. The upshot was something like this:

*Digital badges promise to allow some and force others to transcend existing paradigms of recognizing, assessing, motivating, and studying learning.*

Beyond this prediction I could not really add very much beyond referencing Cathy Davidson’s suggestion that the 2012 competition might be the “tipping point” for the DML community.

But in the last couple of week, Cathy Davidson, Bill Penuel, Michael Olneck and others have initiated a really great discussion of this issue on one of our project blog posts at HASTAC on studying learning with digital badges. These exchanges convinced me to return the notion of transcendent functions in light of the work over the subsequent year. Cathy’s closing question on her initial comment really helped move my thinking forward:

*Is it possible that the chief importance of badges will be to push wholesale reform of existing credentialing systems? Or is the present system too much rooted in an antiquated view of disciplines, competencies, expertise, authority, credentialing, ability/disability, hierarchy and data to be as useful as badging potentially is for new ways of defining the talents needed in the world we live in now?*

• If badges transform credentialing...
  – Will recognition of learning be crowdsourced?

• If badges transform assessment...
  – Will credibility transcend validity?

• If badges transcend intrinsic vs. extrinsic motivation...
  – Will cultural models of motivation (finally) take hold?

• If badges transform research methods...
  – Will DBR transcend RCTs?
Credibility & Validity

• Mozilla’s Carla Casilli suggested that that credibility might trump validity
  – But credibility is an “unsanctioned” aspect of validity
• Carla suggested B. J. Fogg’s credibility taxonomy
  – Presumed credibility arises from “general assumptions in the mind of the perceiver”
  – Surface credibility arises from “simple inspection or initial firsthand experience”
  – Reputed credibility arises through “third party endorsements, reports, or referrals”
  – Earned credibility arises from “firsthand experience that extends over time”
• Alternative to existing notions of validity?
  – Content, criteria, and construct-related evidence in Popham et al.
  – Content, substantive, structural, generalizability, external, and consequential in Messick et al.
Educational Data Science Practices (Piety, Hickey, & Bishop, proposed 2014)

- **Learning Analytics**
  - Concerns events
- **Learner Analytics**
  - Concerns learners
- **Educational Data Mining**
  - Concerns groups of learners, courses
  - Associated with AI tutors
- **Institutional Research**
  - Concerns institutions
  - Mostly in higher education
- **Systemic Improvement**
  - Concerns educational systems
  - Associated with K-12 & NCLB
Participant Interactions with Digital Badge Functions
# Social Acquisition Landing Pages

## Overview

- **All Visits**

The graph above shows the trend of visits over time from October 25th to November 10th.

## Table of Shared URLs

<table>
<thead>
<tr>
<th>Shared URL</th>
<th>Visits</th>
<th>Pageviews</th>
<th>Avg. Visit Duration</th>
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The table shows detailed insights into the visits, pageviews, average visit duration, data hub activities, and pages per visit for each shared URL.
BOOC Attrition by Networking Group

Source of External Visits to Practices Evidence Pages

- Facebook Mobile: 42%
- Facebook: 18%
- Twitter: 23%
- Google: 6%
- Gmail: 5%
- siftlinks: 1%
- Saudi Arabia: 3%
- drivertrainingse rvices.com: 2%
Relative Participation of Awardees, Enrollees, and Others

Endorsements
Promotions
Comments
CSOL: An Ecosystem of Informal Learning
CSOL: An Ecosystem of Informal Learning
### Scaling Up Participation
(Hickey, Kelly, & Shen, proposed 2014)

| COURSE FEATURE                  | SMALL & INTUITIVE
Closed Course with *Sakai and Sites* | BIG & SYSTEMATIC
Big Open Course with *Course Builder* | MASSIVE & AUTOMATIC
Massive Open Course with *Course Builder*

| Define personalized context     | Constructed in first assignment | Selected & constructed in registration & 1st assignment | Selected and constructed, with a live dashboard |
| Create and assign networking groups | Assigned manually via wiki homepage | Used a spreadsheet | Groups created algorithmically. |
| Rank relative relevance         | Manually in wikifolio            | Drag descriptions and write rationale | Drag descriptions and write rationale |
| Provide Feedback                | Manually by instructor           | With spreadsheet, teaching assistant, and notifications | Algorithmically, with tags |
| Peer Endorsement                | Unique comment string            | Button                                                   | Button with tracking |
| Peer Promotion                  | Unique comment string            | Button & warrant field                                 | Button & warrant field with tracking |
| Testing                         | Timed, open ended and multiple choice | Multiple choice pool                                   | Multiple choice computer adaptive |
| Awarding Badges                 | Manually via plugin              | Automated                                               | Automatic |
Context: Integrate badge system into existing curriculum (integrated build).

• **Gain external recognition** from employers.
• **Gain formal endorsement** of badge system from sports and media partners.
• **Badge hierarchy.**
• **Badges are a permanent record** of achievement.
• Skills learned are **relevant to careers**.
• Some badges will be **peer-awarded**.
Assessing Learning

- **Leveled assessments** for leveled badges.
- **E-portfolios** collect resources for assessment.
- Badges are validated by experts, a computer scoring system, and peers.
- **Indirect standards alignment.** Participating teachers integrate S2R into their own curriculum.
- **Rubrics** are used to assess artifacts and portfolios.
• Role recognition/community engagement. *Students will be motivated to fill the roles of sports journalists.*

• **Provide privileges.** S2R opens reporting opportunities to the most dedicated students.

• **Hierarchical use of badges.** Medals echoing those in the sports world are prestigious markers of achievement.
Like most DML grantees, S2R did not intend to implement a formal program to study their badge system.

The need for data arose when talking to potential partners.

• Implementing 2-year research OF badges to see how students and employers interact with badges.
• S2R’s platform allows research WITH & FOR badges, will lead to improvement of the badge system.
Initiative Analyses

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Gates Mastery Projects

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Hive Projects
Principle: Use Performance Assessments in Relevant Contexts

Several projects are using performance assessment in their badge systems. Unlike the other principles that have emerged, performance assessment has no subcategories because performance assessment in and of itself is a specific kind of practice. The following resources offer guidelines for implementing performance assessment without compromising learning or the assessment outcomes by "teaching to the test."


Many of the projects are using performance assessments. This book is one of the most comprehensive reports on assessment and Chapter Three provides much of the justification for performance assessment approaches. The authors assert that "drawing out and working with existing understandings is important for learners of all ages" (p. 84), bringing to light the importance of employing prior knowledge in context to highlight what students know and understand. They go on to state that "social contexts for learning make the thinking of the learner apparent to teachers and other students so it can be examined, questioned, and built upon as part of constructive learning" (p. 89). This point is important in performance assessment because performance assessments attempt to elicit responses that show understanding in relevant but removed contexts from those in which the original content was learned.


Mehrens et al. provide six guidelines for using performance assessment, and suggest that instructors should be careful in how they prepare students for such assessments lest they compromise the assessment. Any project using performance assessment in their badge system should read the guidelines outlined in this short paper to ensure they are assessing what they mean to assess.


Popham's chapter on performance assessment is quite comprehensive and is a good resource for anyone using performance assessment. It lays out the merits and downsides of performance assessment, and gives very specific guidelines on how to carry it out. I've used this chapter several times as I've written about performance assessment and