

Usefulness and Validity of the Team Development Measure for Assessing Teamwork in Interprofessional Education

Wendy S. Madigosky MD MSPH,

Monica McNulty MS, Janice L. Hanson PhD EdS

University of Colorado Anschutz Medical Campus

Center for Interprofessional Practice and Education



Objectives

- Describe process of determining whether a tool can be useful and valid in your IPE setting
- Describe the Team Development Measure (TDM) tool
- Describe TDM use in a classroom-based interprofessional education course
- Describe evidence that the TDM provides useful and valid assessment of team development in a classroom-based interprofessional education course



Would TDM be useful for us?

- Does the content align with the goals and objectives of the curriculum?
- Does content align with team learning experiences?
- Are the questions on the tool asked in a way that is familiar to learners?
- Do I think this tool will drive useful changes in team functioning?
- Will it be possible to gather evidence for valid use of the tool in our setting?
 - » Learner feedback
 - » Cronbach's alpha
 - » Information about how the tool drives learning



TDM Description

- Developed by Bill Mahoney PhD and Carolyn Turkovich through support from the John A Hartford Foundation, Inc., the Robert Wood Johnson Foundation, and PeaceHealth
- 31 item Likert-style survey
- Grounded in conceptual and applied literature on teams and healthcare teamwork
- Psychometric analysis included exploratory factor analysis and the Rasch model

Stock R, Mahoney E, & Carney, PA (2013). Measuring team development in clinical care settings. *Fam Med*, 45(10), 691-700.

Mahoney B & Turkovich C (2017). *The Team Development Measure*. Peace Health Medical Centers, available at <https://www.peacehealth.org/about-peacehealth/medical-professionals/eugene-springfield-cottage-grove/team-measure/Pages/default>



TDM Components

- Cohesiveness
- Communication
- Role Clarity
- Goals & Means Clarity



TDM Components: Cohesiveness

- Members are attracted to the team.
- Members find team membership personally meaningful.
- Members enjoy the company of other team members.
- Team members support, nurture and care for one another.
- All team members feel free to share ideas and suggest ways to improve team functioning.
- Team members feel that they are allowed to use their unique skills for the benefit of the team.
- The team develops a “we” feeling.
- The team begins to develop creative solutions to problems.



TDM Components: Communication

- When problems arise the team openly explores options to solve them.
- Team members say what they feel and think.
- Regardless of the topic, communication between members is direct, truthful, respectful and positive.
- The team openly discusses decisions before they are made.
- Conflict is handled in a calm, caring and healing manner.
- Team members do not talk about each other behind their back.
- Team members do not have a personal agenda.



TDM Components: Role Clarity

- Members take on the role of Team Member
- Accomplishments of the team are placed above those of individuals.
- Team goals are seen by all as more important than their personal goals.
- Roles and responsibilities are clearly understood by all.
- Members have a clear understanding of what other team members expect of them.



TDM Components: **Goals & Means Clarity**

- There is no confusion about the work of the team.
- Goals of the team are clearly understood by all.
- There is no confusion about how to reach the team goals.
- The team has agreed upon criteria for evaluating the outcomes of the team.



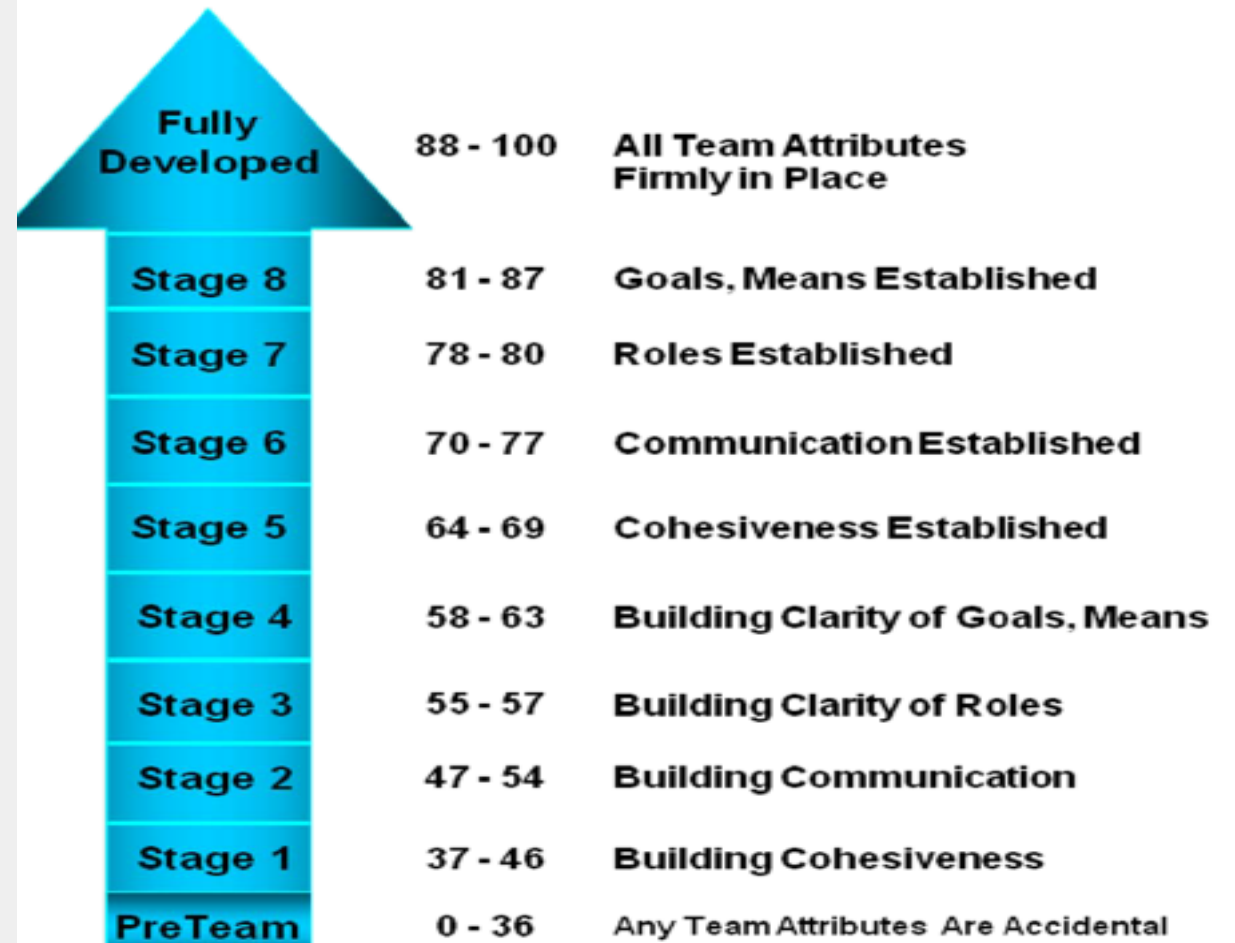
TDM Scoring

- Scores on the measure are interval (one point is the same size anywhere on the scale) and thus the measure literally constitutes a yardstick to measure team development.
- Scores range from 0-100 where 0 = no team development and 100 = full team development.
- Team development is how far the team is up the yardstick between no team development and full team development.



Stages of Team Development

- **Solidification of Components**: How firmly those components are in place in the team.
- **Presence of Components**: How many of the components of team development are present in the team



TDM Evidence

- Used in over 150 teams by more than 1000 individuals.
- Tested in teams of 3-4 persons as well as teams of > 40 persons.
- In a sample of 1195 people from 145 different teams, Cronbach's alpha is .97 for the 31 items.
- M plus exploratory factor analysis where items are appropriately treated as ordered categorical variables (ordinal) all items load strongly on a single factor.



Background

- TDM was created for clinical teams; however, team development assessments are needed in the interprofessional education (IPE) setting.
- The Anschutz Medical Campus has IPE curricular offerings in the classroom, simulation and clinical settings
- The classroom-based Interprofessional Education and Development (IPEd) course is required for students in dentistry, medicine, nursing, physician assistant, physical therapy, and pharmacy programs.
- During IPEd, interprofessional teams of ~8 students work together over the course of two semesters in 16 two hour sessions



Design

Validity evidence was gathered in 4 of 5 domains*for TDM use in IPED

- Content Validity
- Response Processes
- Internal Structures
- Consequences of Using Tool

*American Educational Research Association (AERA), American Psychological Association (APA). National Council on Measurement in Education (NCME) (2014) Standards for Educational and Psychological Testing, American Educational Research Association. Washington, DC.



Content Validity

- TDM development and item selection were reviewed
- Mapping IPED goals and objectives to TDM domains and items demonstrated relevance for the Teamwork and Collaboration domain of the course.
- TDM items mapped to overall IPED course outcomes as well as teamwork and collaboration objectives in seven of sixteen course sessions.



Mapping (Content Validity)

IPED Course Learning Objectives for Teamwork and Collaboration	Relevant TDM Domains
<ul style="list-style-type: none">• Identify team characteristics, formation and leadership	Cohesiveness
<ul style="list-style-type: none">• Describe and apply structured team communication processes	Communication
<ul style="list-style-type: none">• Describe roles and responsibilities among the health professions	Role Clarity
<ul style="list-style-type: none">• Describe and apply conflict management, advocacy and assertion techniques	Communication Goals & Means
<ul style="list-style-type: none">• Reflect on and contribute to interprofessional team development	Cohesiveness Communication Role Clarity Goals & Means



Response Process

- Faculty reviewers found TDM instructions clear and items easy to answer.
- The Likert-scale structure of item responses was familiar to students in the course.
- Students and faculty found TDM reports of results clear and easy to interpret



Student Evaluation (Response Process)

Level of Agreement with TDM as a Valuable Platform

Spring 2016
(n=625)



Fall 2016
(n=619)



■ Strongly disagree ■ Disagree ■ Neutral ■ Agree ■ Strongly agree

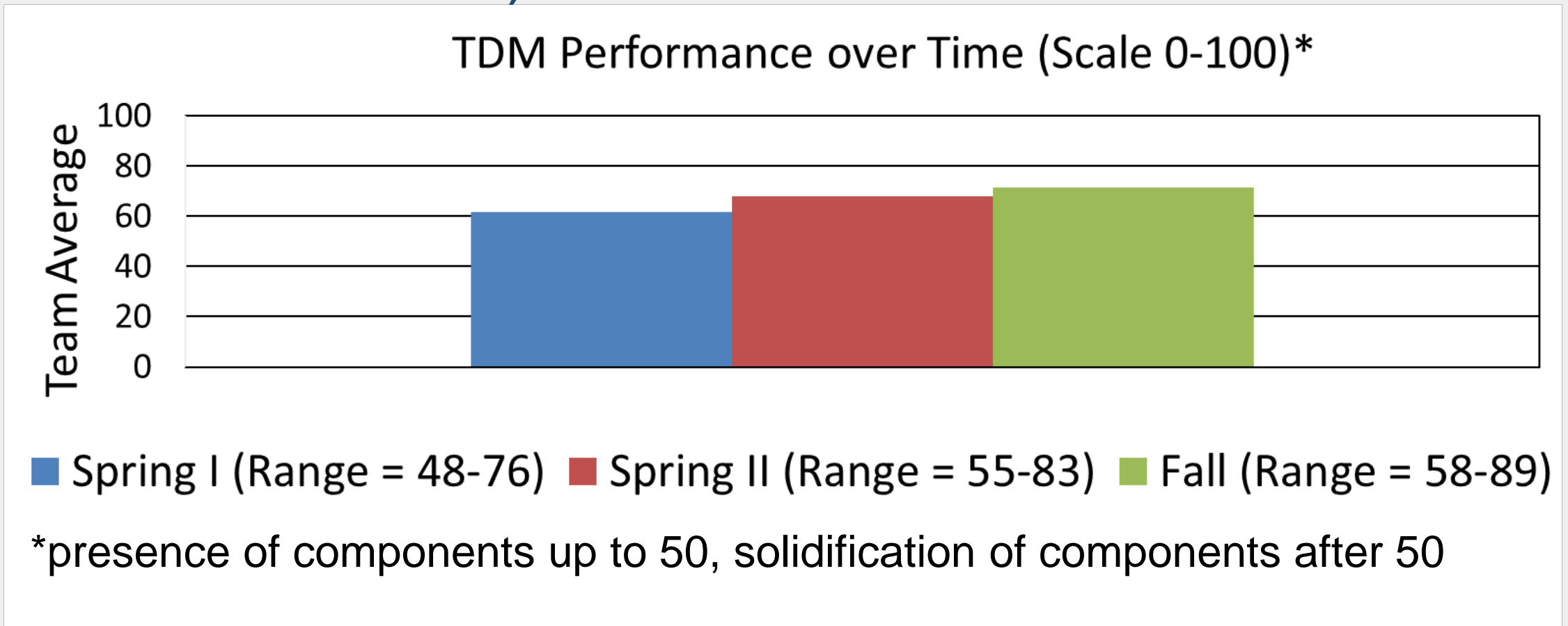


Internal Structure

- An increase in mean team scores between the beginning of the course (Spring I) and subsequent administrations at the end of each semester (Spring II and Fall) indicated that TDM measures growth in team functioning.
- A spread of responses across teams suggested that the TDM discriminates between teams that functioned differently in our IPED classroom setting.
- Cronbach's alpha calculation supported internal consistency for the total measure score & communication and cohesiveness sub-scales.



Increase in Means Over Time and Response Spread (Internal Structure)



Cronbach's Alpha (Internal Structure)

Standardized Cronbach's Alpha Analysis of TDM	Spring I n=470*	Spring II n=632	Fall n=610
Total Measure (31 items)	0.92	0.94	0.96
Cohesiveness (11 items)	0.91	0.93	0.95
Communication (9 items)	0.82	0.84	0.88
Role Clarity (6 items)	0.56	0.63	0.69
Goals & Means (5 items)	-0.18	0.27	0.36



Consequences of Using Tool

- Data from the TDM helped IPED teams identify strengths and weaknesses.
- It additionally prompted teams to identify areas for improvement which they addressed during the remainder of the course.



Conclusions

- Content, response process, internal structure and consequential validity data builds a strong case that using the TDM in an interprofessional classroom setting is valid and helpful.
- Examining data from using an assessment tool developed in clinical settings provided insight about how to build teamwork skills in a classroom setting for interprofessional healthcare professions students.



What are challenges with TDM?

- Negatively worded items may be confusing
 - » Teams anecdotally reported that they may have erroneously entered their rating for the item “Team members talk about other team members behind their back”
- Cronbach alpha for ‘Role Clarity’ and ‘Goals & Means Clarity’ sub-scales were low, so we cannot use them as separate scores to identify team performance in those domains
- Length of survey may be an issue in some settings



Would TDM be useful for you?

- Does the content align with the goals and objectives of the curriculum?
- Does content align with team learning experiences?
- Are the questions on the tool asked in a way that is familiar to learners?
- Do I think this tool will drive useful changes in team functioning?
- Will it be possible to gather evidence for valid use of the tool in our setting?
 - » Learner feedback
 - » Cronbach's alpha
 - » Information about how the tool drives learning

