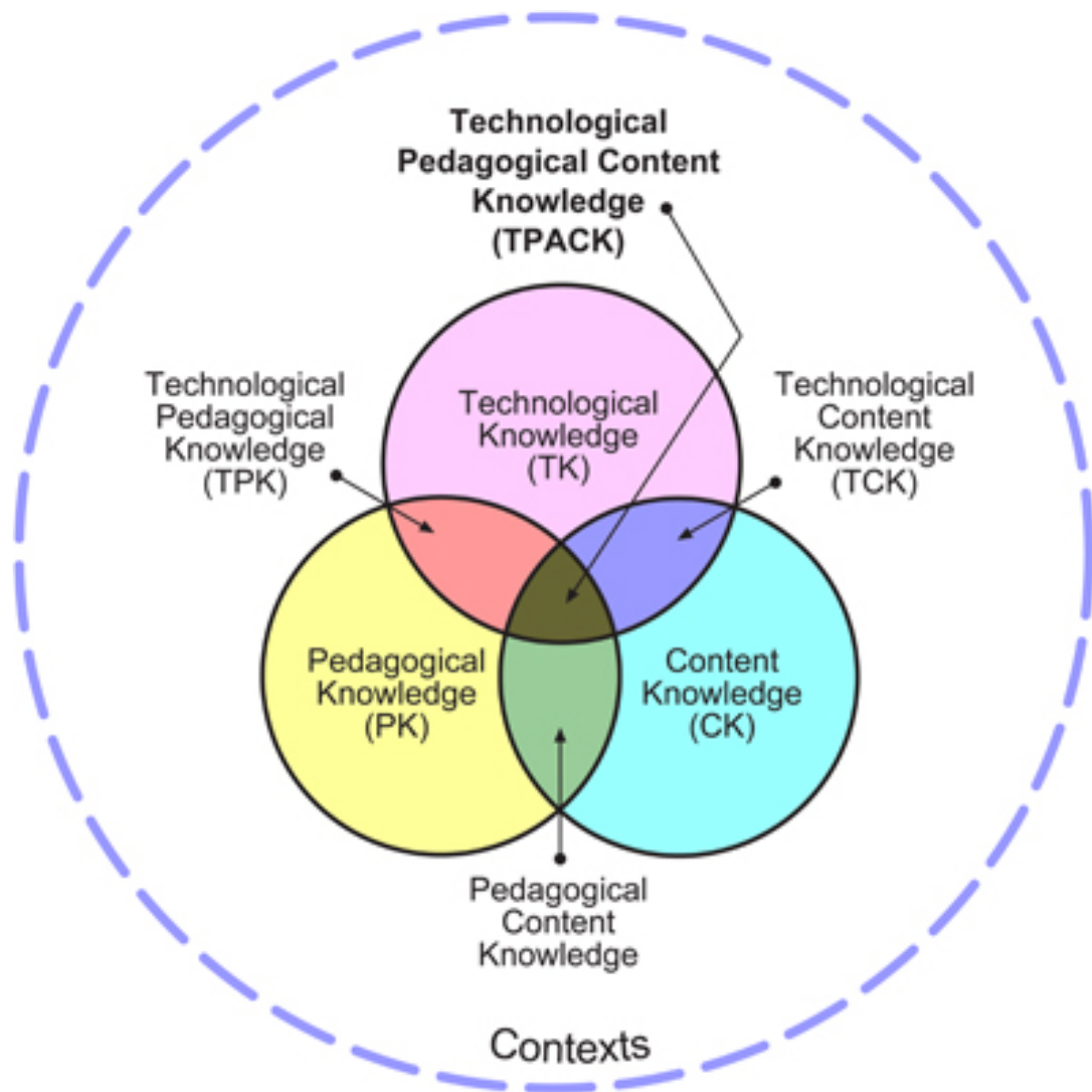


Testing an Instrument Using Structured Interviews to Assess Experienced Teachers' TPACK

Judi Harris - College of William & Mary
Neal Grandgenett - University of Nebraska-Omaha
Mark Hofer - College of William & Mary

<http://activitytypes.wmwikis.net/Assessments/>

TPACK



- exploring
- developing
- *assessing*

2009*

- ▶ 2 surveys
- ▶ 2 performance assessments
- ▶ 1 discourse analysis framework

Technological
Pedagogical Content
Knowledge
(TPACK)

Technological
Knowledge
(TK)

Pedagogical
Knowledge
(PK)

Pedagogical
Content
Knowledge

2012*

- ▶ 10 surveys
- ▶ 4 performance assessments
- ▶ many content/
verbal analyses

Technological
Pedagogical
Knowledge
(TPK)

Content
Knowledge
(CK)

* *tested for reliability/validity*

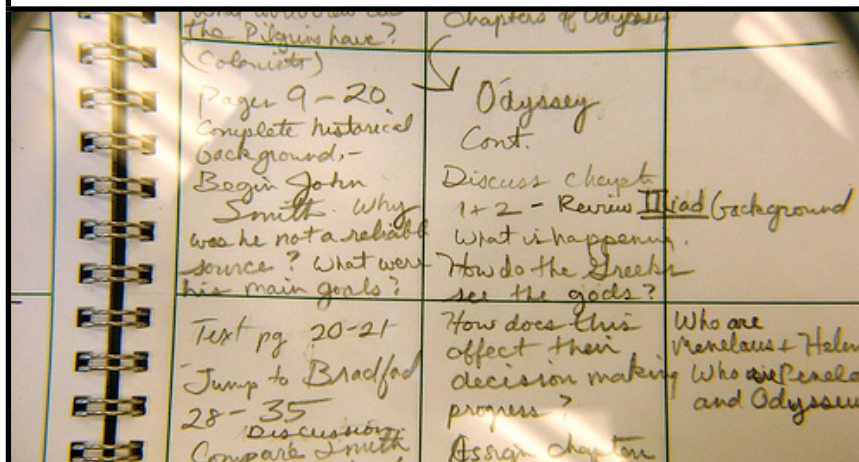
Assessing Teachers' Knowledge



observation



interview



artifacts

1. I know how to solve my own technical problems.						
2. I can learn technology easily.						
3. I keep up with important new technologies.						
4. I frequently play around the technology.						
5. I know about a lot of different technologies.						
6. I have the technical skills I need to use technology.						
7. I have had sufficient opportunities to work with different technologies.						
CK (Content Knowledge)						
Mathematics						
8. I have sufficient knowledge about mathematics.						
9. I can use a mathematical way of thinking.						
10. I have various ways and strategies of developing my understanding of mathematics.						
Social Studies						
11. I have sufficient knowledge about social studies.						
12. I can use a historical way of thinking.						
13. I have various ways and strategies of developing my understanding of social studies.						

self-report

[illegible]

<p>What the Pagans have? (Colman)</p> <p>Pages 9-20 Complete historical background, - Begin John Smith. Why was he not a reliable source? What were his main goals?</p> <p>Text pg. 20-21 Jump to Bradford 28-35 Discussion Compare Smith</p>	<p>Chapters of Virgil</p> <p>Odyssey Cont.</p> <p>Discuss chapter 1 + 2 - Review <u>Iliad</u> background What is happening. How do the Greeks see the gods?</p> <p>How does this affect their decision making process?</p> <p>Assign chapter</p>	<p>Who are Menelaus + Helen Who are Penelope and Odysseus</p>
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self-report

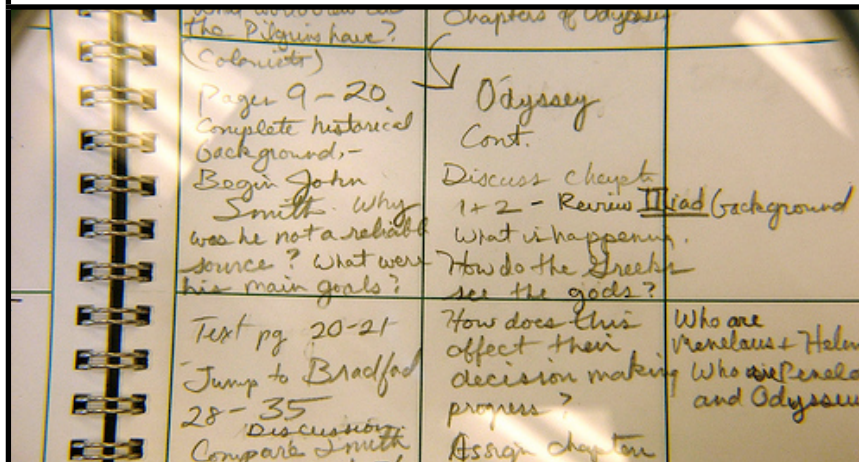
Assessing Teachers' TPACK



observation



interview



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self-report

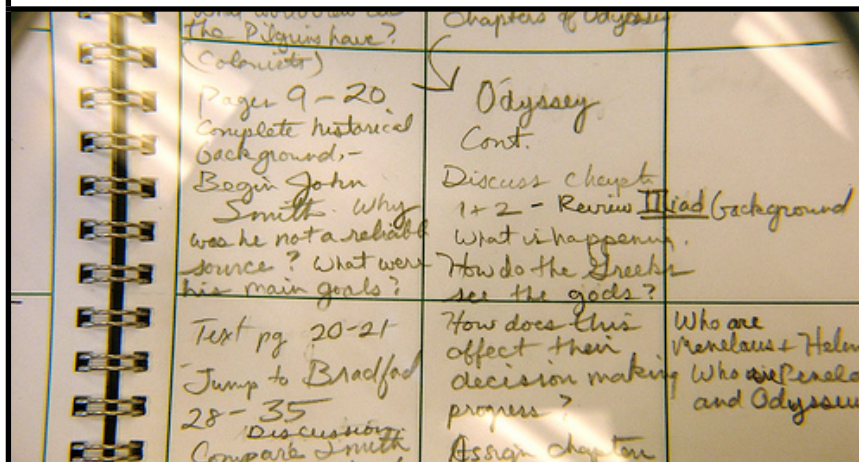
Assessing Teachers' TPACK



observation



interview



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self-report

Assessing Teachers' TPACK



2010

Search

- Valid & reliable TPACK instrument
- External assessment of teaching artifacts (e.g., lesson plans)
- Adapted the *Technology Integration Assessment Instrument* (Britten & Cassady, 2005)

Design

Design

- Informal feedback: Experienced teachers
- Formal feedback: TPACK researchers
- Rubric revision

Design

Criteria	4	3	2	1
Curriculum Goals & Technologies (Curriculum-based technology use)	Technologies selected for use in the instructional plan are <u>strongly aligned</u> with one or more curriculum goals.	Technologies selected for use in the instructional plan are <u>aligned</u> with one or more curriculum goals.	Technologies selected for use in the instructional plan are <u>partially aligned</u> with one or more curriculum goals.	Technologies selected for use in the instructional plan are <u>not aligned</u> with any curriculum goals.
Instructional Strategies & Technologies (Using technology in teaching/ learning)	Technology use <u>optimally supports</u> instructional strategies.	Technology use <u>supports</u> instructional strategies.	Technology use <u>minimally supports</u> instructional strategies.	Technology use <u>does not support</u> instructional strategies.
Technology Selection(s) (Compatibility with curriculum goals & instructional strategies)	Technology selection(s) are <u>exemplary</u> , given curriculum goal(s) and instructional strategies.	Technology selection(s) are <u>appropriate, but not exemplary</u> , given curriculum goal(s) and instructional strategies.	Technology selection(s) are <u>marginally appropriate</u> , given curriculum goal(s) and instructional strategies.	Technology selection(s) are <u>inappropriate</u> , given curriculum goal(s) and instructional strategies.
“Fit” (Content, pedagogy and technology together)	Content, instructional strategies and technology <u>fit together strongly</u> within the instructional plan.	Content, instructional strategies and technology <u>fit together</u> within the instructional plan.	Content, instructional strategies and technology <u>fit together somewhat</u> within the instructional plan.	Content, instructional strategies and technology <u>do not fit together</u> within the instructional plan.

Available: <http://activitytypes.wmwikis.net/Assessments>

Test

Validity Analyses

Test

Validity Analyses

- Construct validity: 6 expert reviewers
- Face validity: 14 experienced teachers

Test *Four Reliability Analyses*

Test

Four Reliability Analyses

- ▶ Interrater reliability - Intraclass Correlation Coefficient = .857
- ▶ Interrater reliability - Percent Agreement = 84.1%
- ▶ Internal Consistency - Cronbach's Alpha = .911
- ▶ Test-Retest Agreement = 87.0%

(preservice teachers' lesson plans)

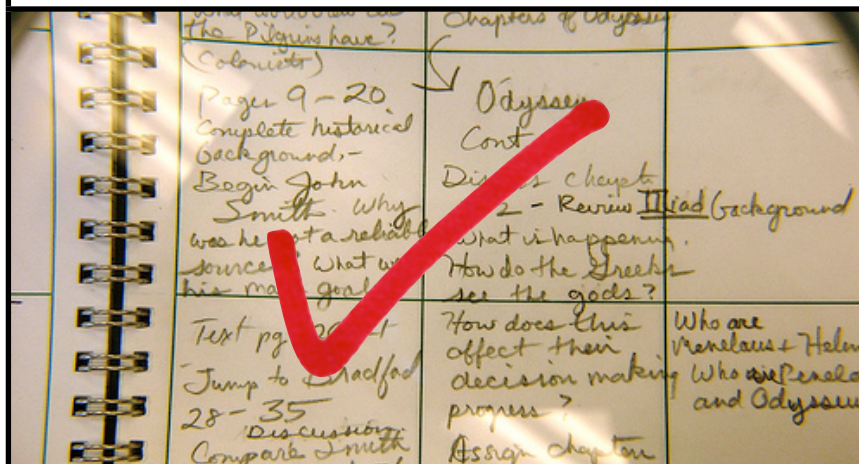
Assessing Teachers' TPACK



observation



interview



artifacts

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self-report

Assessing Teachers' TPACK

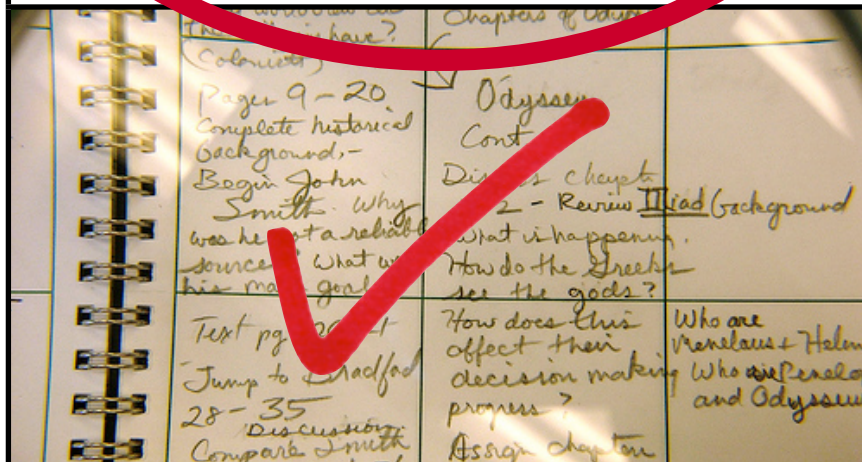
2011



observation



interview



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self-report

Validity

- Construct validity: 5 expert reviewers
- Face validity: 11 experienced teachers

Instrument Testing

- 12 videotaped classroom lessons, various content areas
- 6 preservice, 6 inservice
- Elementary, middle & high school
- 11 scorers in 2 locations

Four Reliability Analyses

- Interrater reliability - Intraclass Correlation Coefficient
- Interrater reliability - Percent Agreement
- Internal consistency - Cronbach's Alpha
- Test-Retest Agreement

Four Reliability Analyses

- Interrater reliability - Intraclass Correlation Coefficient = .802
- Interrater reliability - Percent Agreement = 90.8%
- Internal consistency - Cronbach's Alpha = .914
- Test-Retest Agreement = 93.9%

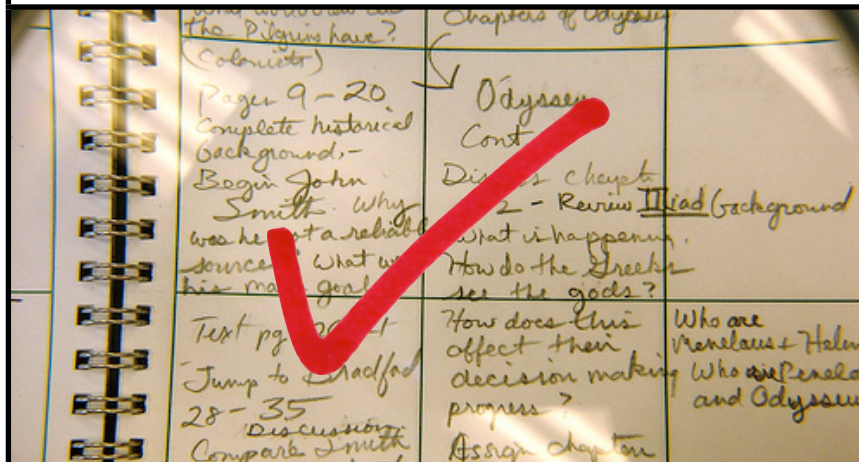
Assessing Teachers' TPACK



observation



interview



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self-report

Assessing Teachers' TPACK

 A photograph showing a classroom with students seated at desks, facing a whiteboard. A large red checkmark is overlaid on the image.	 A photograph of two women sitting outdoors, one holding a clipboard and pen, appearing to be in an interview. A large red circle is drawn around this image.
observation	interview
 A photograph of a spiral notebook with handwritten notes in cursive, including 'The Pilgrims have?', 'Odyssey', and 'Chapters of Odyssey'. A large red checkmark is overlaid on the image.	 A photograph of a self-report survey form with a large red checkmark. The form includes sections for 'CK (Content Knowledge)' with 'Mathematics' and 'Social Studies' sub-sections, and a list of 13 statements for rating.
artifacts	self-report

2012

Structured Interview Protocol



Structured Interview Protocol

LESSON DESCRIPTION



Structured Interview Protocol

LESSON DESCRIPTION

- Content and/or process topics addressed

Structured Interview Protocol

LESSON DESCRIPTION

- Content and/or process topics addressed
- Student learning goals

Structured Interview Protocol

LESSON DESCRIPTION

- Content and/or process topics addressed
- Student learning goals
- Students description

Structured Interview Protocol

LESSON DESCRIPTION

- Content and/or process topics addressed
- Student learning goals
- Students description
- “Walk me through the lesson/project as it unfolded in the classroom.”

Structured Interview Protocol

LESSON DESCRIPTION

- Content and/or process topics addressed
- Student learning goals
- Students description
- “Walk me through the lesson/project as it unfolded in the classroom.”
- EdTechs use: Students and teachers

Structured Interview Protocol

LESSON DESCRIPTION

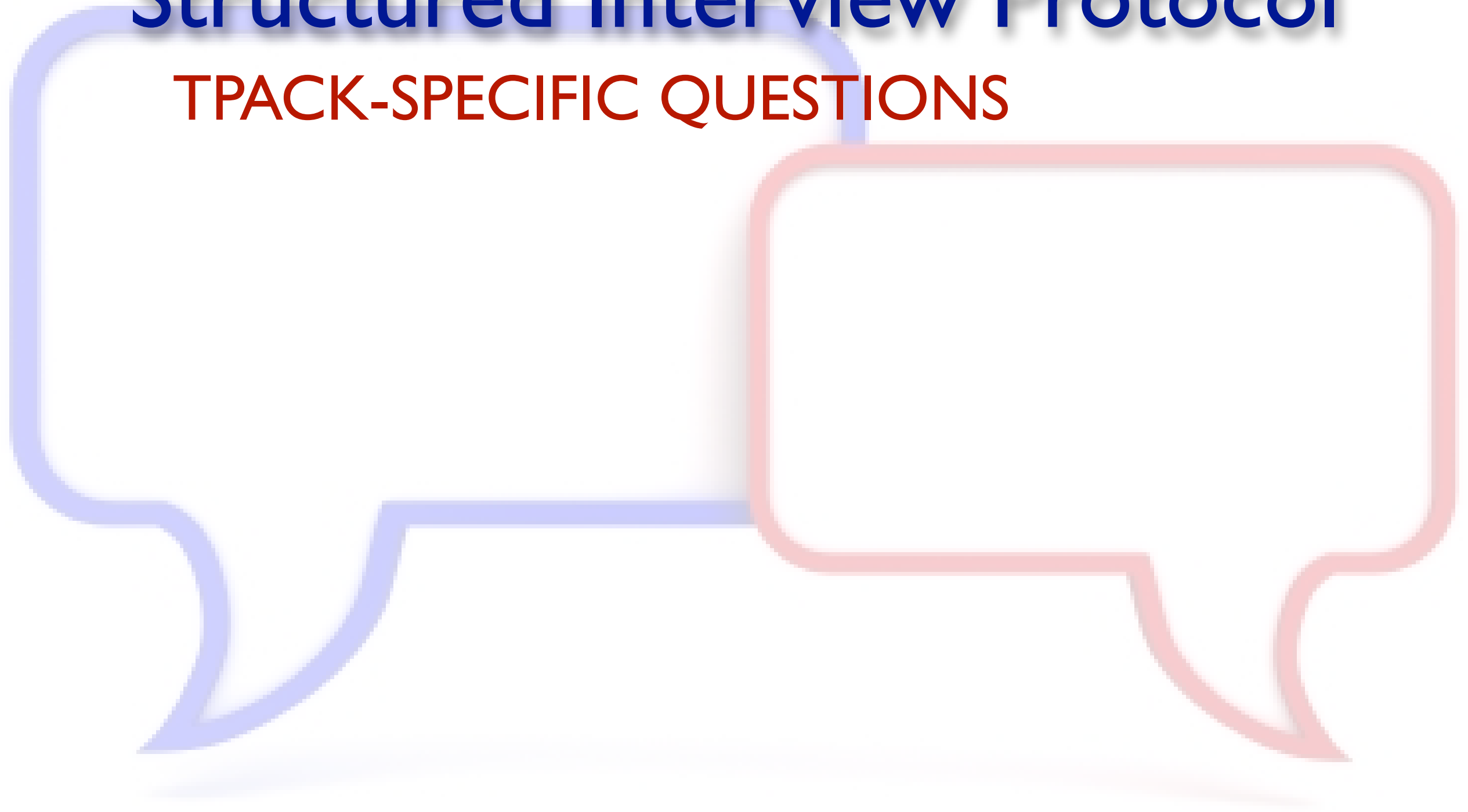
- Content and/or process topics addressed
- Student learning goals
- Students description
- “Walk me through the lesson/project as it unfolded in the classroom.”
- EdTechs use: Students and teachers
- Relevant contextual information

Structured Interview Protocol



Structured Interview Protocol

TPACK-SPECIFIC QUESTIONS



Structured Interview Protocol

TPACK-SPECIFIC QUESTIONS

- “How and why do the particular technologies used in this lesson/project “fit” the content/process goals?”

Structured Interview Protocol

TPACK-SPECIFIC QUESTIONS

- “How and why do the particular technologies used in this lesson/project “fit” the content/process goals?”
- ...”fit” the instructional strategies you used?”

Structured Interview Protocol

TPACK-SPECIFIC QUESTIONS

- “How and why do the particular technologies used in this lesson/project “fit” the content/process goals?”
- ...”fit” the instructional strategies you used?”
- “How and why do the learning goals, instructional strategies, and technologies used all fit together in this lesson/project?”

(Same Rubric)

Criteria	4	3	2	1
Curriculum Goals & Technologies (Curriculum-based technology use)	Technologies selected for use in the instructional plan are <u>strongly aligned</u> with one or more curriculum goals.	Technologies selected for use in the instructional plan are <u>aligned</u> with one or more curriculum goals.	Technologies selected for use in the instructional plan are <u>partially aligned</u> with one or more curriculum goals.	Technologies selected for use in the instructional plan are <u>not aligned</u> with any curriculum goals.
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Instrument Testing

- 12 audirecorded lesson interviews; various content areas
- 6 preservice, 6 inservice
- Elementary, middle & high school
- 11 scorers in 2 locations

Reliability Analyses

- Interrater reliability - Intraclass Correlation Coefficient
- Interrater reliability - Percent Agreement
- Internal consistency - Cronbach's Alpha
- Test-Retest Agreement

Reliability Analyses

- Interrater reliability - Intraclass Correlation Coefficient = **.870**
- Interrater reliability - Percent Agreement = **91.7%**
- Internal consistency - Cronbach's Alpha = **.895**
- Test-Retest Agreement = **100%**

Instrument Reliabilities:

Lesson Plans, Observations, Interviews

Instrument Reliabilities:

Lesson Plans, Observations, Interviews

- Interrater reliability - ICC:

.857

.802

.870

Instrument Reliabilities:

Lesson Plans, Observations, Interviews

- Interrater reliability - ICC:

.857

.802

.870

- Interrater reliability - Percent Agreement:

84.1%

90.8%

91.7%

Instrument Reliabilities:

Lesson Plans, Observations, Interviews

- Interrater reliability - ICC:

.857

.802

.870

- Interrater reliability - Percent Agreement:

84.1%

90.8%

91.7%

- Internal consistency - Cronbach's Alpha:

.911

.914

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Instrument Reliabilities:

Lesson Plans, Observations, Interviews

- Interrater reliability - ICC:

.857

.802

.870

- Interrater reliability - Percent Agreement:

84.1%

90.8%

91.7%

- Internal consistency - Cronbach's Alpha:

.911

.914

.895

- Test-Retest Agreement:

87%

93.9%

100%



Technology Integration Assessment
Instrument (2010)

Technology Integration Observation
Instrument (2011)

Technology Integration Assessment
Interview Protocol (2012)

Available: <http://activitytypes.wm.edu/Assessments>