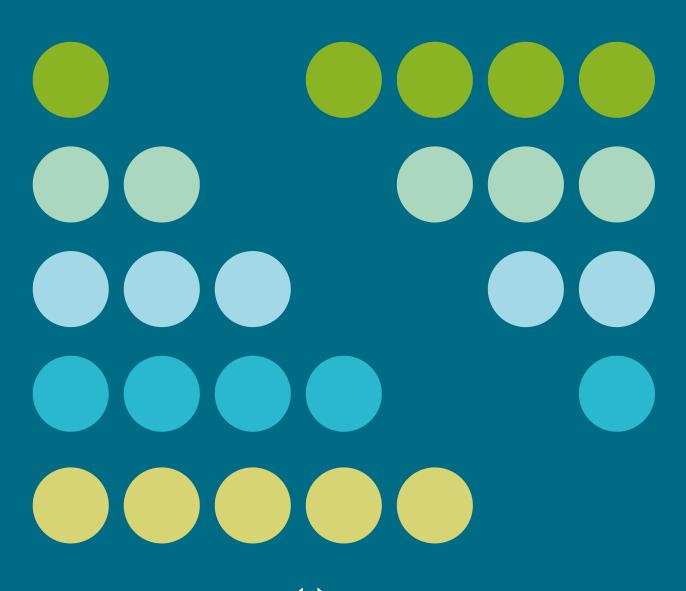**Data Insights Report**
Dr Richard Churches

How to assess the potential to teach

New evidence from a STEM teacher assessment centre model in England

DATA UPDATE 2021

Education Development Trust

Future Teaching SCHOLARS

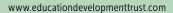Department for Education

Background

In 2020, we published our first report into the Future Teaching Scholars assessment centre and its validity and reliability.[1] This report, funded from our Research and Development budget, also presented preliminary evidence in relation to the assessment centre's ability to predict later classroom practice. The research measured teacher effectiveness using the Education Development Trust *Teacher Practice Tool*.

This research is part of a longitudinal study that will add successive cohort data as participants move into their initial teacher training (ITT) year. It will then track the progress of all teachers until the end of their third year in teaching.

Systematic review of the main education databases and other sources suggested no previous research had established the psychometric properties of an education assessment centre or its ability to predict later performance. This is still the case.[2] More in-depth statistical analyses will be available year-on-year.

[1] Churches R and Lawrance J (2020) How to assess the potential to teach: new evidence from a STEM teacher assessment centre model in England. Reading: Education Development Trust. [2] Australian Education Index (1977 – current), British Education Index (1975 – current), ERIC (1966 – current), Google Scholar, Web of Science. Search terms: education; assessment centre; recruitment, selection, teacher training.

Future Teaching Scholars and its assessment centre

The Department for Education Future Teaching Scholars programme is a six-year route into teaching. During an undergraduate degree, participants receive experiences in schools, online learning, and face-to-face training. In the fourth year, they join initial teacher training (ITT) as an employed unqualified teacher. Following attainment of Qualified Teacher Status, in collaboration with a SCITT (School-Centred Initial Teacher Training centre), they receive two further years of support.

Most candidates apply for the programme aged 17-18 whilst completing their A levels. Successful applicants must pass the assessment centre. This includes a *competence-based interview*, *classroom simulation*, *reflection* on the simulation and *group problem-solving activities*.[3] Teaching Schools across England ran the assessment centres with serving teachers conducting the majority of the evaluations, and all evaluations in the *simulation*.

The *classroom simulation*, in which two serving teacher observers roleplay learners interrupting or finding it hard to understand, aims to measure innate 'mental set'[4] prior to teacher training. Specifically, a candidate's 'with-it-ness' (ability to monitor/quickly identify potential problems and act) and 'emotional objectivity' (staying calm, not getting angry or frustrated).

Together, these are known to have a large effect,[5] reducing classroom management issues.[4] If the assessment centre was effective, we expected to find this activity particularly able to predict later classroom performance.

A film of the classroom simulation in progress using actors, created to help train assessors, is available from the QR code link.
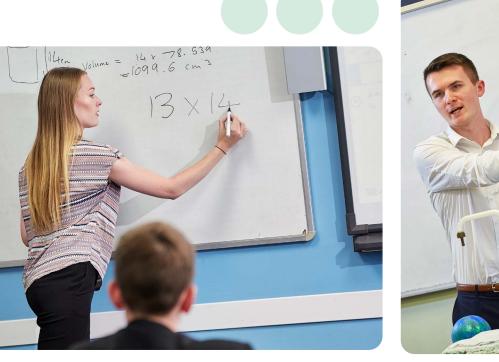

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[3] See Appendix A for a table illustrating which of the 12 competencies assessors scored in which activities. [4] Marzano RJ, Marzano JS and Pickering DJ (2003) Classroom management that works: research-based strategies for every teacher. Virginia: Association for Supervision and Curriculum Development. [5] d = - 1.25

Content in this update

This update paper reports on the latest in our ongoing analyses and looks again at the predictive validity of the assessment centre, this time with a larger sample size.[6] It looks at the assessment centre scores of two cohorts recruited in 2016 and 2017 and compares the relationship between their assessment centre scores (prior to any training) and their classroom performance three years later, at the end of their first term in teaching.

We will publish analyses of data from the teachers' second year of teaching and retention next year, when sample sizes have again increased further and have sufficient power to detect an effect.

Full information about the Future Teaching Scholars assessment centre and the first year of research is available online.[1]
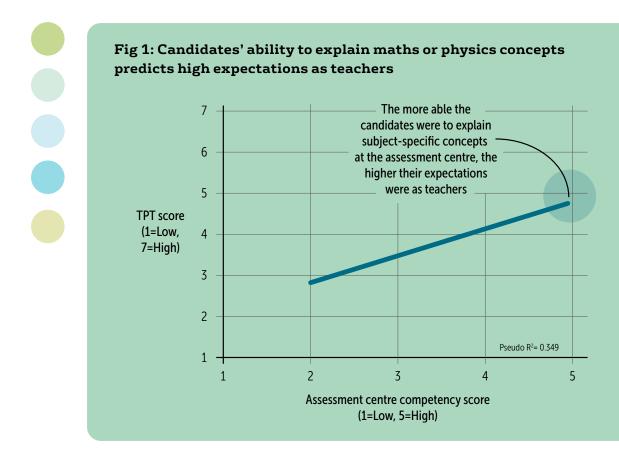
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[6] N = 89

Findings

We explored the relationship between the competencies assessed during the four assessment centre activities and Teacher Practice Tool scores.[7] In the light of the distributions and nature of the data[8] we then estimated the relative predictive strength[9] of these significant associations within each competence and activity.[10]

Classroom simulation

Classroom simulation was the best predictor of teacher effectiveness. Across the seven competencies assessed by this activity, there were 14 significant positive associations with later practice
(see Appendix B, Tables 1 to 3).

Candidates' ability to explain subject-specific concepts in the simulation predicted later teaching performance in relation to: high expectations (Fig 1), the maximising of learning time, structuring and designing learning, giving feedback to learners, and variety of subject specific learning tasks.

Fig 1: Candidates' ability to explain maths or physics concepts predicts high expectations as teachers

The more able the candidates were to explain subject-specific concepts at the assessment centre, the higher their expectations were as teachers

TPT score (1=Low, 7=High)

Pseudo R^2= 0.349

Assessment centre competency score
(1=Low, 5=High)

[7] We evaluated the internal reliability of the teacher practice tool (TPT) for the larger year 2 study data set using Cronbach's alpha. The TPT had excellent levels of reliability (α = .96). [8] Although assessment centre competencies and Teacher Practice Tool items measure using a 5- and 7-point Likert Scale, respectively, there was a restricted range within the data, particularly in the assessment centre competencies. Candidates who scored more than one '2' at the assessment centre were ineligible to join the programme, therefore nearly all scores were between '3' and '5'. [9] Cox and Snell pseudo R-squared (linear ordinal regression). [10] Pseudo R-squared compares the fit of the chosen model with that of a horizontal straight line, with any negative values showing that the data does not fit the model (prediction). A pseudo R-squared can only be compared to another pseudo R-squared of the same type predicting the same outcome. In this situation, the higher pseudo R-squared indicates which model better predicts the outcome. Comparisons between these results should therefore only be made in regard to each competence assessed and not across competencies or assessment centre activities. [11] Pseudo R-squared (Cox and Snell) line of linear regression (see Appendix).

Demonstrating *passion for maths or physics* in the simulation predicted four out of five of the same competences. The exception was *giving feedback*. *Perseverance in the face of challenges* was associated with *continuous assessment* and *providing challenge in the classroom*. *Initiative and problem-solving ability* and the *ability to balance competing objectives* both predicted *high expectations*. *Empathy and cultural awareness* predicted *recognising Special Educational Needs and providing relevant support*.
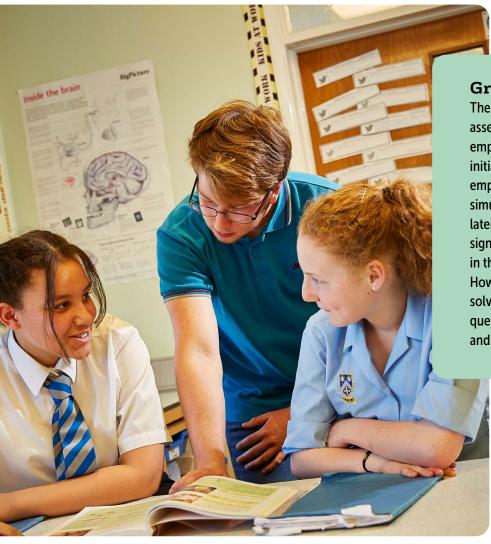
Simulation scores did not predict three areas of later practice: clarity of explanations and instructions, and both questioning to encourage engagement and questioning to encourage thinking. This is understandable if we consider these as areas of classroom practice likely to require training to develop and, therefore, areas unlikely to appear 'innate' in a context where someone untrained is attempting to teach.

Competence-based interview

Despite seeking to measure the widest range of competencies[12] the competence-based interview was not a good predictor of later classroom effectiveness. Although ability to explain a maths or physics concept again predicted high expectations, no other competencies were predictors of later effective classroom practice.

Furthermore, and surprisingly, the stronger candidates' espoused passion for working with young people, the less effective was their classroom practice. This was the case for: providing challenge, recognising Special Educational Needs and providing relevant support, assessing learning continuously, and assessments of ability to provide an appropriate variety of learning tasks and asking questions to promote thinking.
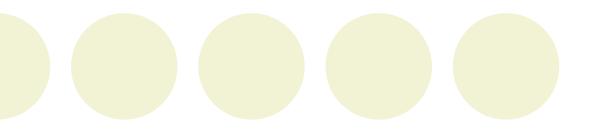
[12] See Appendix 1.

Group problem-solving

The group problem-solving activity assessed only two competencies: empathy and cultural awareness and initiative and problem-solving. Where empathy as assessed in the classroom simulation had predicted one area of later classroom practice, there were no significant associations with this area in the group problem-solving exercise. However, initiative and problem-solving predicted later effectiveness in questioning to encourage engagement and feedback.

Reflection after the simulation

Assessors interviewed candidates immediately after the *classroom simulation* and asked them to reflect on the teaching they had done. No competencies assessed during this discussion predicted later classroom practice.

Conclusions and lessons for schools

The findings from this second analysis point were broadly in line with those in our first report, with a greater number of significant findings emerging because of the larger sample size.

In general terms, the second year of findings again parallels applied psychology recruitment research, where observations of people conducting work-related activities (in a wide range of professions) are usually better predictors of later performance than what people say about themselves during interview situations.

The research continues to support the value of schools asking candidates to demonstrate their ability to explain subject content and skills dealing with learners, or observers roleplaying learners, while doing this. As important as interviews are, they can only draw out a person's motivation and theoretical understanding of practice. Uncovering someone's ability to teach requires an observation of teaching in some form.

What our research also points to is how teachers alone can conduct such activities, roleplaying and observation in a valid and reliable way, without always needing the use of a live class of students. That said, further research would be necessary to establish the relative effectiveness of different approaches and to compare serving teachers as observers with people who no longer practice as teachers.

> **'Uncovering someone's ability to teach requires an observation of teaching in some form.'**

Appendix A

Matrix illustrating which competencies and values are assessed in which selection and assessment centre activity

| | | Assessment centre | | | | Online application | |
	Recruitment activity	Competency-based interview	Classroom roleplay	Reflection [post-classroom roleplay]	Group activity	Paperwork	Essay
You as a scientist/mathematician	Passion for mathematics or physics	✓	✓				
	Knowledge and skill in mathematics or physics					✓	
	Initiative and problem-solving ability		✓		✓		
	Ability to explain mathematics or physics concepts	✓	✓				
You as a teacher	Belief in the power of teaching to drive social change	✓					✓
	Passion for working with young people	✓					
	Ability to balance competing objectives	✓	✓				
	Understanding the role of a teacher	✓					
You as a person	Empathy and/or cultural sensitivity		✓		✓		
	Perseverance in the face of challenges	✓	✓				
	Reliable, responsible and committed					✓	
	Reflective and committed to self-improvement	✓		✓			

(Row group heading: **Competencies**)

Appendix B

Statistical tables

Table 1.

Simulation activity (classroom roleplay) – assessment centre measures that predicted later classroom practice as measured by the *Teacher Practice Tool* (N = 89)

Ability to explain mathematics or physics concepts	r_s	p-value	Pseudo R²
The teacher demonstrates high expectations	.589	< 0.0005	.349
The teacher provides a variety of learning tasks that enable students to see, understand and master the content they are learning (all subjects)	.300	.004	.024
Lessons are well-structured	.267	.011	.064
The teacher responds to students' answers to provide feedback and encourage discussion	.231	.029	.050
Learning time is maximised	.213	.045	.071
Passion for maths or physics			
The teacher demonstrates high expectations	.210	.048	.107
Lessons are well-structured	.378	< .0005	.141
Learning time is maximised	.376	< .0005	.140
The teacher provides a variety of learning tasks that enable students to see, understand and master the content they are learning (all subjects)	.312	.0003	.150
Perseverance in the face of challenges			
The teacher continuously assesses students	.336	.001	.157
Learning tasks engage and provide appropriate challenge for all students (all subjects)	.226	.033	.032
Initiative and problem-solving ability			
The teacher demonstrates high expectations	.388	< .0005	.216
Ability to balance competing objectives			
The teacher demonstrates high expectations	.220	.039	.059
Empathy and/or cultural sensitivity			
The teacher recognises pupils with Special Educational Needs and provides them with relevant support	.209	.049	.112

Table 2.

Competence based interview – assessment centre measures that predicted later classroom practice as measured by the *Teacher Practice Tool* (N = 89)

Ability to explain mathematics or physics concepts	r_s	p-value	Pseudo R²
The teacher demonstrates high expectations	.573	< 0.0005	.409

Passion for working with young people			
Learning tasks engage and provide appropriate challenge for all students (all subjects)	-.372	< .0005	.016
The teacher continuously assesses students	-.361	.001	.010
The teacher recognises pupils with Special Educational Needs and provides them with relevant support	-.303	.004	.012
The teacher provides a variety of learning tasks that enable students to see, understand and master the content they are learning (all subjects)	-.302	.004	.010
The teacher provides a variety of learning tasks that enable students to see, understand and master the content they are learning (subject specific)	-.301	.004	.055
The teacher asks questions that encourage students to think	-.262	.031	.057

Table 3.

Group problem-solving – assessment centre measures that predicted later classroom practice as measured by the *Teacher Practice Tool* (N = 89)

Initiative and problem-solving ability	r_s	p-value	Pseudo R²
The teacher asks questions in ways that engage students	.242	.043	.138
The teacher responds to students' answers to provide feedback and encourage discussion	.212	.046	.116

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