InSights

Standardised Assessment of Initial Teacher Education: Environmental Scan and Case Studies

A paper prepared for the Australian Institute for Teaching and School Leadership

Prof William Louden

February 2015

Initial
Teacher
Education

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Purpose

Australia has a large and complex teacher education system, with 48 providers offering more than 400 programs and graduating more than 15,000 potential teachers every year. The accreditation system relies on three related elements: *the Australian Professional Standards for Teachers*' Graduate Teacher Standards, which make explicit the knowledge, skills and attributes expected of graduates; the Program Standards, which describe the characteristics of programs that give confidence that the Graduate Teacher Standards will be achieved; and the accreditation process, which sets out a nationally consistent approach to accreditation.

Accredited teacher education programs rely on the Graduate Teacher Standards in planning their assessment structures, but each institution designs its own assessment instruments. Standardised assessments, designed for use across multiple institutions and jurisdictions are rarely used. There has, however, been increased policy interest in recent years in the possibility of using standardised assessments of attributes such as literacy and numeracy to underpin accreditation and registration standards.

The purpose of this paper is to explore the use of standardised assessments in teacher education. The paper identifies four types of assessments and provides examples of each of these. The paper concludes with an analysis of the implications for assessment in Australian teacher education, including a set of policy options.

Summary

1. There are four broad kinds of standardised entry and exit assessments used in teacher education: basic skills assessments; content knowledge assessments; pedagogical knowledge assessments; and teaching performance assessments.

2. Almost all of these assessments are designed for use in United States' teacher certification programs. The significant non-American example is England's Professional Skills Tests.

3. Although some assessment programs are state-based and designed to meet local requirements, most of these are provided by Educational Testing Service or Pearson.

4. Virtually all assessments are now computer-based. The most common item type is multiple-choice, but many assessments include constructed-choice (written) items such as short answer explanations, case studies or professional writing tasks. Tests may be as short as 45 minutes or as long as five hours for multi-part content knowledge assessments. Performance assessments, which include student-made videos of teaching, work samples and reflective commentaries, may take many hours to construct. The UK assessments are free, and US assessments range from $US50 for the shortest multiple-choice assessments to $US300 for double-marked

and moderated performance assessments.

5. In the Australian context, the two most promising opportunities for the use of standardised assessments are in professional skills assessments and teaching performance assessment.

- Literacy and numeracy skills assessments make sense in the context of mass higher education and a wide variety of teacher education entry routes.

- Authentic performance assessments, particularly those using digital platforms, make the most of contemporary assessment technology and offer the opportunity to strengthen national assessments of "readiness to teach".

1. Basic skills assessments

Basic skills assessments are not used in countries where the status of teachers is high and entry to teacher education is competitive.[1] In Finland, only one in ten applicants is selected, and candidates are all drawn from the top quartile of high school graduates. In Korea, primary school teacher education candidates are recruited from the top 5% of school leavers. In Canada, the majority of teacher education candidates are drawn from the top 30% of university graduates.

Basic skills assessments are used in the United Kingdom and the United States. In England, applicants for teacher education places must pass professional skills assessments in literacy and numeracy. In some US states basic skills assessments are required before admission to a teacher education program; in some states they are required before the end of the program as a condition of teacher registration; and in some states universities use them in the teacher education admission process. Unlike the US assessments, which use general contexts, the UK assessments use educational contexts for their test items.

There are two major providers in the US, ETS and the Evaluation Services group of the global educational services provider Pearson. Appendix 1 provides a summary table for basic skills assessments.

1.1 ETS basic skills assessments

The *Praxis Core Academic Skills for Educators (CORE)* assessments in reading, writing and mathematics are designed for candidates entering teacher education. They are used in more than 40 states, either for on-entry assessment in initial teacher education courses or as a requirement for teacher licenses. The *Praxis CORE* tests replaced the long-running Praxis *Pre-Professional Skills Test (PPST)* in 2013. The new tests reflect the Common Core State Standards, the US's voluntary national standards of teaching and learning. The language and mathematics domains of these national standards have now been adopted in 43 states.[2]

The *Praxis CORE* tests are described as more rigorous and comprehensive than the tests that they replace.[3] The three *Praxis CORE* subtests (reading, writing and mathematics) are all computer-based and cost a total of $135. The reading and mathematics subtests take 85 minutes and contain 56 multiple choice questions. The reading subtest is all multiple-choice and covers key ideas and content; craft, structure and language skills; and integration of knowledge and ideas.[4] The mathematics subtest contains 56 multiple-choice and numeric entry questions. An on-screen calculator is included. The test domains include number and quantity; algebra and functions; geometry; and statistics and probability.[5] The writing subtest takes 100 minutes, divided into a 40-minute, 40 question multiple-choice section and two 30-minute essay sections. Language and research skills for writing questions are multiple-choice, and text types, purposes and production items are in both multiple-choice and essay form. A sample 30-minute essay task appears in Figure 1.[6]

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1   <http://www.ncee.org/programs-affiliates/center-on-international-education-benchmarking/top-performing-countries/>
2   <http://www.corestandards.org/about-the-standards/development-process/>
3   <https://www.ets.org/praxis/news/praxis_core_academic>
4   <https://www.ets.org/s/praxis/pdf/5712.pdf>
5   <https://www.ets.org/s/praxis/pdf/5732.pdf>
6   <https://www.ets.org/s/praxis/pdf/5722.pdf>

Figure 1. *Praxis CORE* **writing subtest sample essay writing task**

Read the opinion stated below:

"Minimum-wage jobs are a ticket to nowhere. They are boring and repetitive and teach employees little or nothing of value. Minimum-wage employers take advantage of people because they need a job."

Discuss the extent to which you agree or disagree with this opinion. Support your views with specific reasons and examples from your own experience, observations, or reading.

| Cut |
| Paste |
| Undo |

National pass rates on the new *CORE* tests are not available, but *PPST* national pass rate percentages were in the high 80s, with 3-5% more candidates passing after supplementary attempts. In Pennsylvania, for example, first attempt pass rates in the period 2010-11 to 2012-13 in the *PPST* computerised skill tests were 84.7% for reading, 77.2% for writing and 77.9% for mathematics. Cumulative pass rates (after re-sits) were 89.0% for reading, 82.2% for writing and 78.8% for mathematics.[7]

1.2 Pearson basic skills assessments

Pearson provides both national and state-based basic skills assessments. The national *Essential Academic Skills (EAS)* assessments are part of Pearson's *National Evaluation Series* and are used in a few US states. There are three *EAS* subtests: reading; writing; and mathematics. All are computer-based and the total cost of the three *EAS* tests is $100. In Oregon, the *EAS* assessments are required for teacher licensing.

The reading subtest has 45 multiple-choice questions and takes an hour to complete. The test requires understanding the meaning of words and phrases; understanding the main idea and supporting ideas in written material, and understanding the writer's purpose; using critical reasoning skills to evaluate written material; and understanding the organisation of information in written or graphic forms.[8] Test items are in the familiar multiple-choice comprehension form, with a series of questions following a 300-400 word text. A sample question for the reading test appears in Figure 2.

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[7] <http://www.portal.state.pa.us/portal/server.pt/community/tests_%E2%80%93_pass_rates/8636>

[8] <http://www.orela.nesinc.com/Content/Docs/NES_Framework_001.pdf>

Figure 2. *EAS* reading subtest sample comprehension question

Which of the following statements best expresses the main idea of the passage?

A. With Hispanic television companies reaching as much as 85 per cent of Hispanic American families, the future of Hispanic media in the United States looks very bright.

B. Hispanic media companies owe much of their success to an ability to provide expanded programming choices and a welcoming cultural context to a diverse Hispanic American community.

C. Hispanic media have been so successful that even mainstream radio and television networks are beginning to provide Spanish-language programming.

D. Although bilingual Hispanic American media consumers watch and listen to mainstream programming, they clearly prefer the culturally familiar offerings on Hispanic radio and television stations.

The writing subtest has 36 multiple-choice questions and one written assignment. The test domains are purpose, audience and organisation in writing; problems with sentence formulation; grammar, usage and mechanics; and composition[9]. It takes one hour and 15 minutes to complete. The written assignment is allocated 25% of the subtests' marks and uses a general essay prompt such as the one in Figure 3.

Figure 3. *EAS* writing subtest sample essay writing task

An American poet and essayist once observed that "the less government we have, the better."

Write a composition, to be read by an audience of educated adults, in which you:

- **discuss why you agree or disagree with this observation; and**

- **defend your position with logical arguments and specific examples.**

The mathematics test has 45 multiple-choice questions and takes one hour. The assessment contexts are general, rather than focused on the application of skills in teachers' professional work. The assessment domains are number, algebra, geometry, probability and statistics, and problem solving and mathematical communication.[10]

Pearson's state-based assessments include the *California Basic Educational Skills Test (CBEST)* and the *Washington Educator Skills Test (WEST-B)*, which are required for admission to accredited teacher education programs, and New York's *Academic Literacy Skills Test (ALS)*, which is required for teacher licensing.

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[9]   <http://www.orela.nesinc.com/Content/Docs/NES_Framework_002.pdf>
[10]   <http://www.orela.nesinc.com/Content/Docs/NES_Framework_003.pdf>

CBEST is a computer-based assessment program comprising three sub-tests: reading, writing and mathematics. The reading section includes 50 multiple-choice questions and assesses ability to comprehend information presented in written passages, tables, and graphs. The mathematics section also contains 50 multiple-choice questions. Three skill areas are targeted: estimation, measurement and statistical principles; computation and problem solving; and numerical and graphic relationships. Calculators are not allowed. The writing section requires two written responses: one an analysis of a given situation or statement; the other a specified personal experience. None of the assessment items on any of the subtests requires any specialist educational knowledge. The tests take a total of four hours and cost $102. *CBEST* pass rates for all three sections were 71.5% in 2012-13. Cumulative pass rates, after resits, were 79.7%.[11]

New York's Academic Literacy Skills Test is a computer-based assessment with 40 multiple-choice items, two short-answer responses and one long-answer written response.[12] The assessment takes three hours and thirty-five minutes and costs $131. The content is general, rather than specific to teachers' professional uses of literacy and numeracy. Writing assessment items include short (150 word) interpretations of written and graphical prompt material and long (400-600 word) analytical essays.[13]

WEST-B is a compulsory entry assessment, required before candidates can be admitted to an approved Washington state teacher education program.[14] *WEST-B* costs $155 for registration and the three subtests. The reading and mathematics tests each contain 60 multiple-choice questions and take two hours. The writing test contains 50 multiple-choice items and two written assignments and takes three hours. The tests are all computer-based.

1.3 UK professional skills assessments

Professional skills assessment are similar to basic skills assessments, in that the knowledge domains assessed are English and mathematics, but the difference is the focus on the literacy and numeracy requirements of teachers' work. The assessment currently being prepared by Australian Council for Educational Research for the Australian Institute for Teaching and School Leadership is one such assessment.

The most significant example of this kind of assessment is the professional skills assessments that were introduced in England and Wales in 2000. Students were required to pass literacy, numeracy and ICT assessments before gaining the initial qualification for teaching in schools. Initially assessments were paper-based, but they have subsequently been computerised. They are no longer compulsory in Wales.

Following the publication of the *Schools White Paper* in 2010[15] a number of changes were made to the assessment regime.[16] In 2012, the passing score was raised from 60 to 63, the timing of the assessments was changed, failing candidates were limited to two re-sits, and the ICT assessment was dropped.

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11 <http://www.ctc.ca.gov/reports/exam-passing-rate-FY-2008-09-2012-13.pdf>
12 <http://www.nystce.nesinc.com/NY_testinfo.asp?t=202>
13 <http://www.nystce.nesinc.com/NY_PM.asp?t=202>
14 <http://www.west.nesinc.com/TestView.aspx?f=HTML_FRAG/WA095_TestPage.html>
15 <https://www.gov.uk/government/publications/the-importance-of-teaching-the-schools-white-paper-2010>
16 <https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/181154/DFE-00083-2011.pdf>

Although the assessments originally were taken in the final year of study, since September 2013 the assessments must be passed *before* candidates can be admitted to initial teacher education programs.

The professional skills assessments are offered to intending teacher education students at no cost, but there is a fee of £19.25 per assessment for resits. Until recently, the assessments could be taken in any of the 150 Pearson Professional Centres in the UK. From 1 December 2014 a rival company, 'learndirect', administers the assessments. The assessments do not replace the requirement that initial teacher education candidates have C-grade GCSE scores in English and mathematics, and in a science subject if they want to teach in primary schools or secondary schools up to the age of 14.

The literacy assessment contains four sections (spelling, punctuation, grammar and comprehension) and must be completed in 45 minutes.[17] The spelling section is an audio assessment taken using headphones. The words to be spelled are in common professional use. The punctuation section requires candidates to insert punctuation marks into a piece of writing. The grammar section assesses grammar in use, not knowledge of grammatical terms, and is based on construction of a short piece of text online. The comprehension section uses documents published by educational authorities or the educational press. Candidates are asked to re-work, organise and structure information in order to demonstrate their capacity to identify the main points of a text; distinguish between facts and opinion; retrieve facts and key points; make inferences and deductions; and evaluate meaning and status. Sample spelling and grammar questions from a literacy practice assessment are provided in Figures 4 and 5, below.

Figure 4. Professional skills assessment spelling sample question

Spelling

Literacy Practice Paper 2

Q **Select the correctly spelt word from the box of alternatives. Click on your choice and drag it to the line in the appropriate sentence.**
To change your answer, click and drag your previous answer back to the box with the alternatives.

1 It was a credit to the staff that the children had low levels of ⬚ in the run-up to the tests.

| anxsiety | anxiety | angxiety | anxciety |

2 The importance of the safety precautions cannot be ⬚ .

| exaggerated | exagerated | exagerrated | exaggerrated |

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[17]   <http://sta.education.gov.uk/professional-skills-tests/literacy-skills-tests>

Figure 5. Professional skills assessment grammar sample question

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Grammar C

Literacy Practice Paper 2

Q **Complete the following passage. Select the best of the given alternatives at the points at which there are blank lines. Click on one of the choices and drag it to the relevant blank line.**

To change your answer, click and drag the answer back to the box, then click and drag an alternative choice. You will need to check that you have made the best overall set of choices for completing the passage.

This is an extract from a staff circular about Young Enterprise.

For the third consecutive year, the school is preparing to take part in Young

Enterprise. This scheme is a national education charity founded to inspire young

people to learn through business enterprise and link schools and industry.

It was started in 1963.

A **Some of you could have heard of Young Enterprise, or may of taken part in the scheme.**

B **Some of you may of heard of Young Enterprise, or could of taken part in the scheme.**

C **Some of you may have heard of Young Enterprise, or may have taken part in the scheme.**

D **Some may have heard of Young Enterprise, or may of taken part in the scheme.**

The numeracy assessments contain 28 questions, 12 mental arithmetic and 16 on-screen questions.[18] The time allowed for the assessment is 48 minutes. The mental arithmetic questions are heard through headphones and test ability to carry out mental calculations using time, fractions, measurements and conversions. For the on-screen questions, candidates are provided with an on-screen calculator. The on-screen questions cover time; money; proportion and ratio; fractions, decimals and percentages; measurements; conversions; averages; and using simple formulae. Sample papers with worked answers are available from the Government's website[19] and commercial preparation resources are widely available. Two sample questions from a numeracy practice assessment are provided in Figures 6 and 7, below.

Almost 80,000 candidates took the literacy and numeracy assessments in

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[18] <http://www.education.gov.uk/sta/professional/b00211213/numeracy/areas.html>

[19] <http://sta.education.gov.uk/professional-skills-tests/numeracy-skills-tests>

2012/13, when they were compulsory for both new applicants and graduating students.[20] The proportion passing both assessments dropped from 98.22% in 2011/12 to 93.25% in 2012/13, when the passing score was raised from 60 to 63. The pass rate for exit candidates (95.18%) was higher than the pass rate for entry candidates (91.57%), reflecting the more intensive support available to candidates during their teacher education programs.

Alternative forms of assessment are available for candidates with visual or hearing impairment, physical disabilities and dyslexia, or English as an additional language.[21]

The assessment agency provides teacher education providers with access to a website containing reports on results for their own and all other providers' cohorts. The Government's stated intention is to allow providers to benchmark their students' performance and take their scores into account in program planning and support.

Figure 6. Professional skills assessment mental arithmetic sample question

Mental Arithmetic   Numeracy Practice Paper 2

Q **Question 10**

A pupil achieved 84 marks out of a possible 120 in a test.

What percentage mark did the pupil achieve for the test?

Answer: [   ] %

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20   <http://www.education.gov.uk/sta/professional/a00212158/statistics.html>
21   <http://www.education.gov.uk/sta/professional/b00211219/special-arrangements.html>

Figure 7. Professional skills assessment on-screen sample question

On-Screen   Numeracy Practice Paper 2

Q **Question 7**

To set targets for the following year, the mathematics department analysed the percentage of mathematics GCSE grades A* - C achieved by pupils in the school.

Indicate all the true statements:
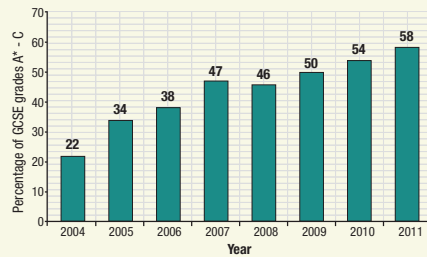
☐ The mean percentage of GCSE grades A* - C for the last 5 years of the chart was 51%.

☐ The percentage of GCSE grades A* - C increased each year from 2004 to 2011.

☐ The percentage of mathematics GCSE grades A* - C more than doubled from 2004 to 2011.

2. Content knowledge assessments

Many content knowledge assessments are available in the United States. Some states, such as California, rely on their teacher education accreditation systems to guarantee sufficient content knowledge and only use content knowledge assessments for supplementary purposes such as out-of-state applicants. Other states, such as New York and New Hampshire, require students to take content knowledge assessments as one of the requirements for initial teaching certification. Appendix 2 provides a summary table for content knowledge assessments.

2.1 ETS content knowledge assessments

The largest range of content knowledge assessments is provided by ETS through their *Praxis II* series. Although there are about 100 such tests available, States using content knowledge assessments as part of teacher licensing choose a subset of these. New Hampshire, for example, uses about 20 *Praxis II* assessments to cover content required to teach in particular phases of schooling (early childhood or elementary) or subjects (four middle-school subjects and eight secondary subjects).[22]

Praxis II assessments range in cost from $50 to $150. The chemistry content test is a computer-based assessment. There are 125 multiple-choice questions to be answered in two and a half hours. The test is pitched at the level required in introductory college-level chemistry courses plus a few more advanced questions. Content covered includes scientific principles and method; matter and energy; atomic and nuclear structure; chemical composition and bonding; chemical reactions and periodicity; and solutions and solubility.[23] Figure 8 provides a sample question.

Figure 8. Praxis II Chemistry sample question

15. The solubility product, K_{sp} for $Mg(OH)_2$ is 1.0×10^{-11}. What is the concentration of Mg^{2+} in a saturated solution of this base?

(A) $\sqrt{5.0 \times 10^{-12}}$ M

(B) $\sqrt{1.0 \times 10^{-11}}$ M

(C) $\sqrt[3]{2.5 \times 10^{-12}}$ M

(D) $\sqrt[3]{1.0 \times 10^{-11}}$ M

[22] <https://www.ets.org/praxis/about/praxisii>
[23] <https://www.ets.org/s/praxis/pdf/5245.pdf>

2.2 Pearson content knowledge assessments

Pearson's *National Evaluation Series* includes eight phase-specific assessments for early childhood, elementary and middle school education, eleven secondary subject-specific assessments, and 13 K-12 subject-specific assessments. All assessments are computer-based and take between three and four hours to complete. The cost per test is $95. As is the case for states using the ETS *Praxis II* tests, states chose among the full set of tests to meet their own requirements. *NES* content assessments are currently used in Arizona, Oregon, Washington and Wisconsin. The secondary chemistry assessment, for example, contains 150 multiple-choice questions, and takes three hours and forty-five minutes. There are five content domains, essentially the same as the *Praxis II* chemistry test: the nature of science; matter and atomic structure; energy and chemical bonding; chemical reactions; and stoichiometry and solutions.[24] Figure 9 provides a sample question.

Figure 9. NES Chemistry sample question

Solubility Curves for
Two Ionic Compounds in Water

Key
—▲— compound A
—■— compound B
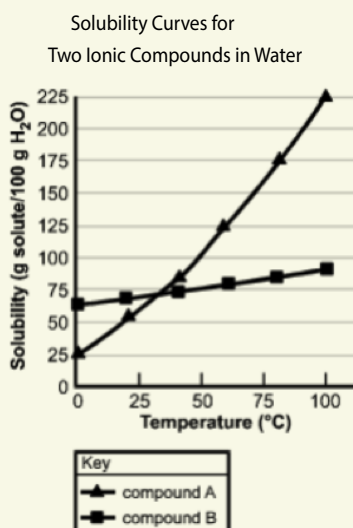
Based in the solubility curves shown above, which of the following procedures will be most effective in isolating the greatest amount of pure compound A from a mixture consisting of 200 g of compound A and 15 g of compound B?

A. dissolving the mixture in 100 g of water and then heating to the solution's boiling point

B. dissolving the mixture in 100 g of water at 100°C and then decreasing the temperature to 0°C

C. dissolving the mixture in 100 g of water at 75°C, filtering the solution, and then retaining the filtrate

D. dissolving the mixture in 100 g of water and then slowly increasing the temperature to 100°C

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[24]   <http://www.nestest.com/Content/Docs/NES_Profile_306.pdf>

Pearson also provides bespoke content assessment programs for many states. Pearson's *Californian Subject Examinations for Teachers (CSET)*, for example, cover more than 40 content areas.[25] The assessments require a total of five hours test time and are computer-based. The cost per subtest is $69. Tests are organised around content required for specific phases of schooling or school subjects. The *Science CSET* assessment, for example, contains three subtests. Two of the three sub-tests cover general science and the third covers an area of science specialism. The two general science sections each have 58 multiple-choice questions and two constructed-response (written) questions. The subject specialist subtest contains 50 multiple-choice and three short-answer written questions. The first-time pass rate for *CSET Chemistry* in 2012-13 was 79.1% with a cumulative rate (after resits) of 80.8%.[26] Figure 10 provides a sample question for the *CSET Chemistry Subtest III*.[27]

Figure 10. CSET Chemistry Subtest III sample question

5. **Use the information below to answer the question that follows.**

$$CH_3Br + OH^- \rightarrow CH_3OH + Br^-$$
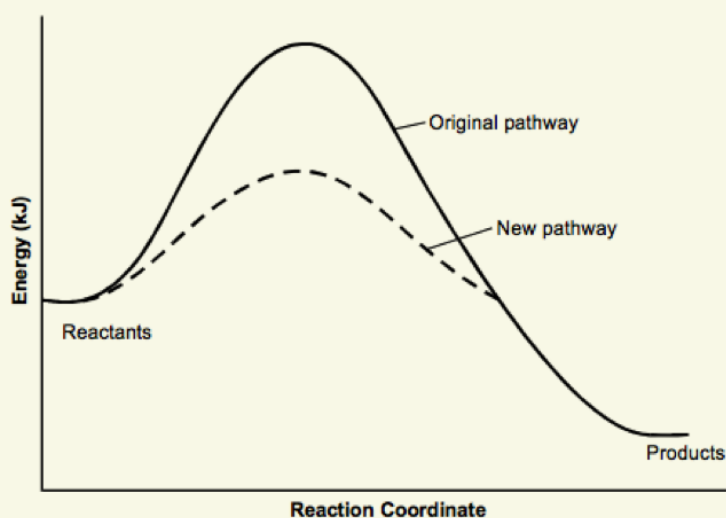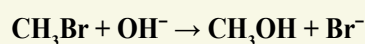
The graph above shows the energy profile for the given reaction. Which of the following actions will result in the new pathway illustrated on the graph?

A.   adding a catalyst

B.   adding Br^-

C.   adding OH^-

D.   increasing the temperature

25   <http://www.ctcexams.nesinc.com/about_CSET.asp>
26   <http://www.ctc.ca.gov/reports/exam-passing-rate-FY-2008-09-2012-13.pdf>
27   <http://www.ctcexams.nesinc.com/PM_CSET.asp?t=119>

The New York *Content Specialty Tests (CSTs)* are also provided by Pearson and are available in more than 40 test forms.[28] The tests are four hours long. Some paper-based tests remain in small content areas, but most tests are computer-based. Costs vary according to the test domain, with Greek costing $79 and physical education costing $149. Like the *CSETs*, *CSTs* are organised around content required for specific phases of schooling or school subjects. The *Chemistry CST*, for example, has 90 multiple-choice questions and one item requiring a 150-300 word written response. Content covered includes foundations of scientific inquiry; matter and atomic structure; energy, chemical bonds and molecular structure; stoichiometry and solutions; and interactions of chemistry and the environment.[29] A sample question from the matter and atomic structure section of the test appears in Figure 11.

Figure 11. *CST Chemistry*: matter and atomic structure sample question

9. **Use the diagram below to answer the question that follows.**

Ionization Energy vs. Atomic Number for the First Twenty Elements
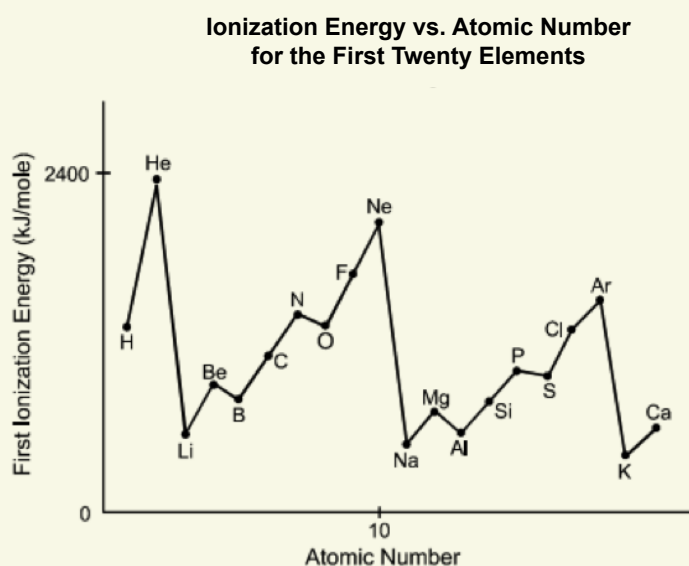
The graph of first ionization energy plotted against atomic number shows that ionization energy is a periodic function. First ionization energy generally increases from alkali metals to noble gases. Exceptions to this general trend can be seen in going from beryllium to boron and from magnesium to aluminium. These two deviations from the line can best be explained by considering each element's:

A. atomic radius.

B. electron configuration.

C. nuclear binding energy.

D. atomic mass.

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28 <http://www.nystce.nesinc.com/NY_toc.asp>
29 <http://www.nystce.nesinc.com/PDFs/NY_fld007_prepguide.pdf>

3. Pedagogical knowledge assessments

In addition to entry or exit basic skills assessment and subject content assessment, some US states also assess pedagogical knowledge. As is the case with other assessment types, ETS and Pearson provide national assessments through the *Praxis* and *NES* test series as well as bespoke assessments designed for individual states. Appendix 3 provides a summary table for pedagogical knowledge assessments.

3.1 ETS assessments

ETS provides a range of pedagogical knowledge assessments, organised by phase of schooling and subject. States requiring such assessments choose a subset of these. In Iowa, for example, students seeking teacher licenses must pass the *Praxis II Principles of Teaching and Learning Early Childhood, Grades K-6, Grades 5-9 or Grades 7-12* assessments.[30] All of these assessments are two hours long, computer-based and available at a cost of $139. The *Grades 7-12* assessment, for example has 70 multiple-choice questions and four constructed-response questions.

Test questions are organised around four topics: students as learners, the instructional process, assessment and professional development. An example of the kinds of pedagogical knowledge about assessment sampled in the multiple-choice questions appears in Figure 12.[31]

Figure 12. *Praxis II Grades 7-12* sample multiple-choice question

6. A teacher would get better information from a criterion-referenced test than from a norm-referenced test about which of the following?

(A) How much each individual student has learned about a particular aspect of the curriculum

(B) How each individual student's knowledge of a particular aspect of the curriculum compares to that of students across the school district and state

(C) How each individual student's knowledge of a particular aspect of the curriculum compares to that of a national sample of students at the same age level

(D) How much of what each student knows about a particular aspect of the curriculum is based on prior knowledge

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One of the constructed-response question types is the case history. The case history might include information about the teaching context and goals, some particular students, a self-reflection, a supervisor's observation and a follow up reflection and lead to questions such as those displayed in Figure 13.

Figure 13. *Praxis II Grades 7-12* **sample constructed-response question**

Question 16

In the introduction to the lesson to be observed Mr. Payton briefly mentions to the modification he has or has not made for some students. Review his comments about modifications for Jimmy and Burns.

- For each of these two students, describe ONE different way Mr. Payton might have provided a modification to offer a better learning situation for each.

- Explain how each modification could offer a better learning situation. Base you explanation on principles of varied instruction for different kinds of learners.

ETS is also the provider for state-specific programs such as the *TExES* assessment series. In addition to their subject content assessment, candidates for teacher licences in Texas are required to complete *TExES #160 Pedagogy and Professional Responsibilities EC-12*. This assessment covers four domains, designing instruction and assessment; creating a positive classroom environment; implementing effective instruction and assessment; and fulfilling professional roles. There are 100 multiple-choice questions in this computer-based assessment in a variety of question formats: single questions, questions with stimulus material, clustered questions and decision sets. The test takes two hours and 30 minutes to complete and costs $120.[32] Figure 14 provides an example.

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[32] <http://cms.texes-ets.org/files/3613/2949/6615/160_ppr_ec12.pdf>

Figure 14. TExES #160 sample constructed-response question

At the end of the unit, Ms. Ramirez has the students complete a self-assessment rubric to reflect on their strengths and weaknesses throughout the project. The rubric has specific questions about their research, slide show presentations and collaboration skills with their group. The rubric also has a comments section; after reading the students' comments, Ms. Ramirez notes that several students expressed that the project was not relevant to their lives.

COMPETENCY 0I0

22. Which of the following outcomes does the self-assessment rubric best promote for students?

   A. Taking responsibility for their own learning and decisions

   B. Determining which group members worked the most on the project

   C. Enabling them to determine their appropriate project grade

   D. Providing a place for them to assess Ms. Ramirez's instruction

3.2 Pearson assessments

Pearson has developed similar assessments in the NES assessment series. Two assessments are available, *Assessment of Professional Knowledge – Elementary and Secondary*. Arizona is the only state that currently requires these assessments as part of initial teacher licensing process. There are 100 multiple-choice questions and two constructed-response questions in a computer-based assessment that takes three hours to complete. The tests cover four content domains: student development and learning; assessment and instruction; and the professional environment. The test includes multiple-choice questions on these three domains as well as constructed-response answers based on a case study and a work product.[33] Figure 15 includes a sample item from the assessment content domain.

Figure 15. *NES Assessment of Professional Knowledge - Secondary* sample constructed-response question

A teacher regularly gives students brief quizzes of three to five questions covering material taught in the current or preceding lesson. Which of the following is likely to be the primary benefit of this practice?

   A. helping improve instruction through ongoing feedback on teaching effectiveness

   B. minimizing the amount of reteaching required for students to master curricular content

   C. ensuring that the teacher has adequate performance data to assign students a fair grade for the class

   D. enhancing students' engagement in the learning process and recognition of key learning goals

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[33] <http://www.nestest.com/Content/Docs/NES_Profile_052.pdf>

Constructed-response questions in the NES *Assessment of Professional Knowledge* are of two types: case study and work product. The case study provides a narrative that includes materials such as the context, the teacher's planning, his or her reflections, and some excerpts from students' journals. Based on this narrative, candidates are asked to answer questions such as those in Figure 16.

Figure 16. *NES Assessment of Professional Knowledge - Secondary* **sample case study constructed-response question**

Write a response in two parts based on the elements of the case study presented above.

Part One

» describe one approach Mr. Wallace took in planning this activity to try to promote students' ability to
work productively in groups, and

» explain why this approach was a good one to take.

Part Two

Write a response based on the elements of the case study above in which you:

» describe one approach Mr. Wallace could have taken to improve students' ability to work productively in groups, and

» explain why this approach would have been effective in improving students' ability to work productively in groups.

4. Teaching performance assessments

Performance assessments are the most recently developed stream of teacher education assessments in United States. Unlike the generic basic skills assessments and the subject-specific content and teaching skills assessments already described, these assessments are designed as a summative assessment at the end of a teacher education program. They are now widely used in teacher licensing. Policies requiring such a final performance assessment are in place in California, Oregon, Washington, Minnesota, Wisconsin, Iowa, Tennessee, Georgia, New York and Hawaii. Illinois, Ohio and Alabama are currently taking steps towards implementation.

There are two competing assessments available to US states and institutions: *edTPA*, based on the *Performance Assessment for California Teachers (PACT)* and hosted by Pearson, and the *Praxis Performance Assessment for Teachers (PPAT)* now being developed by ETS.

In Australia, performance assessments developed in initial teacher education include the Deakin *Authentic Teacher Assessment* and the Melbourne *Clinical Praxis Exam*.

Appendix 4 provides a summary table of teacher performance assessments.

4.1 Stanford-AACTE-Pearson performance assessment

edTPA is based on the *Performance Assessment for California Teachers (PACT)*, which was developed by Stanford teacher educators and the Stanford Centre for Assessment, Learning and Equity. *PACT* was approved for use in California in 2008 after a comprehensive validation study (Pecheone & Chung, 2007). A subsequent validation study (Duckor, Castellano, Téllez, Wihardini & Wilson, 2014) reported a reliability index of 0.92 and evidence that the instrument does in fact measure the construct of "readiness-to-teach".

A national version, the *Teacher Performance Assessment (TPA)* was developed in partnership with the American Association of Colleges of Teacher Education. Subsequently, Stanford engaged the Evaluation Systems group of Pearson as an operational partner to deliver a new national version, *edTPA*. This assessment was field tested with 12,000 teacher education candidates in 2011-2013 and has been operational since 2013.

edTPA is owned by Stanford University, which is responsible for further development of the assessment, on-line training of scorers, and selecting and coding the subject-specific benchmarks. AACTE supports the *edTPA* professional community through communications, professional development and production of resources. Pearson provides the IT platform for *edTPA*, collecting, scoring and delivering results to candidates and teacher education programs.

Figure 17. Overview of *edTPA* tasks, artefacts and rubrics[34]

Task	Artefacts	Rubrics
Planning	• Lesson plans, instructional materials, student assignments, assessments • Planning commentary	1. Planning for Content Understandings 2. Supporting Students' Learning Needs 3. Using Knowledge of Students to Inform Planning 4. Identifying and Supporting Language Demands 5. Planning Assessment to Monitor Student Learning
Instruction	• Unedited video recordings • Instruction commentary	6. Demonstrating a Positive and Engaging Learning Environment 7. Engaging Students in Learning 8. Deepening Learning During Instruction 9. Subject-Specific-Pedagogy 10. Analyzing Teaching Effectiveness
Assessment	• Samples of student work • Evidence of feedback • Summary of student learning Assessment commentary • Evaluation Criteria • Student Self-Reflections	11. Analyzing Student Learning 12. Providing Feedback to Guide Learning 13. Supporting Students' Use of Feedback 14. Evidence of Language Use to Support Content Learning 15. Using Assessment to Inform Instruction

Figure 17 provides an overview of the three tasks[35] in *edTPA*: Task 1 is focused on planning. Candidates are asked to justify their planning in terms of their knowledge of the context, the students' academic and social development, and prior academic learning. Candidates submit lesson plans for a sequence of three to five lessons, complete with any teaching materials and handouts. Task 2 focuses on teaching. Candidates upload one or two unedited video clips, explain what they did to engage students, and reflect on what they would now do differently. Task 3 focuses on assessment. Candidates submit and discuss one assessment and analyse evidence of individual and whole-class learning. Artefacts supporting their reflections include work samples from three students, feedback provided to these students, and an explanation of how the assessments would guide future teaching for the individuals and the class.

The assessment is aligned to the InTASC Model Core Standards (broadly equivalent to the Australian Professional Standards for Teachers) as well as the Common Core State Standards. *edTPA* is a subject-specific assessment, with parallel forms available for 27 teaching fields. The cost to candidates is $300 for a full assessment. Retakes of each task cost $100. Scorers meet stringent standards, undergo training and are paid for training and for scoring the assessments. Each scorer assesses the whole of each candidate's submission.

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34 <https://secure.aacte.org/apps/rl/res_get.php?fid=827&ref=edtpa>
35 PowerPoint presentations and videos describing the operation of *edTPA* are available at:
    <https://secure.aacte.org/apps/rl/resource.php?ref=edtpa>

A field test summary was published in November 2013.[36] This document describes in full the design and architecture of the assessments, the development process, the scoring procedures, standard setting, and evidence of reliability and validity. The validity studies explored content validity, job relevance and construct validity. The field test concluded that the assessment is well-aligned with the professional standards they are intended to measure. Inter-rater reliabilities of 0.83 to 0.92 were reported. Candidate pass rates were calculated for a variety of cut scores, with consequent pass rates ranging from 58% for a high cut score to 78% for a low cut score. The standard-setting panel recommended the higher of these cut scores as the proposed professional (passing) performance standard. These pass rates were based on volunteers in a low-stakes assessment environment and would be expected to increase in a mature program with high stakes outcomes.

4.2 ETS performance assessment

ETS is currently developing an alternative to *edTPA*, the *Praxis Performance Assessment for Teachers (PPAT)*.[37] This assessment is designed to allow students to demonstrate their performance during their teacher education as well as to determine whether they are ready to enter teaching. The assessment has summative and formative components; allows communication between students, mentors and university staff; and collects scores across the whole of a student teaching experience. It would ideally be used during the last practicum or internship prior to graduation. The assessment program is not content specific, but the assessors will be grade level and content experts.

The first pilot began in January 2014. There will be another pilot in the northern spring of 2015, at which time a multi-state standard setting exercise will take place. The cost will be $275 per assessment. Candidates will have the opportunity to resubmit tasks that they do not pass on their first attempt, one time only, for a fee of $85. All of the work samples are stored in an on-line file.

PPAT is aligned to the InTASC Model Core Standards and comprises four tasks.[38] Task 1 is an introduction to the on-line system and focuses on knowledge of students and the learning environment. Task 2 focuses on assessment, with a particular focus on using assessment to inform teaching and learning. Task 3 focuses on instructional design and the use of technology. Task 4 brings together lesson planning, use of research-based teaching strategies, and differentiating instruction. It includes a 15-minute video, work samples from two students, and reflection on what the teacher education student has learned. Task 1 is locally scored; Tasks 2, 3 and 4 are centrally double-scored to increase the reliability and validity of the assessment. *PPAT* ends with an un-scored professional growth plan, which candidates may wish to share with prospective employers.

An overview of the four *PPAT* tasks appears in Figure 18 and a webinar describing the assessment program can be found at <https://www.ets.org/s/ppa/videos/27758_ppat-webinar.html>

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36 <https://secure.aacte.org/apps/rl/res_get.php?fid=827&ref=edtpa>
37 <https://www.ets.org/praxis/news/praxis_performance_assessment_for_teachers_begins>
38 <https://www.ets.org/ppa/educator_programs/about/tasks>

Figure 18. Overview of *PPAT* tasks

InSights

Figure 18. Overview of *PPAT* tasks

Task Title	Type of Task	Description	Scoring
Task 1: Knowledge of Students and the Learning Environment	Formative	• Requires candidates to demonstrate the knowledge and skills that pertain to their student teaching assignment in regard to the students, the school and the community. These factors will help candidates understand the implications on instruction and student learning. • Focuses on the beginning steps of a teacher candidate's practice, including the ability to identify individual learning needs requiring differentiated instruction • Provides first steps for the creation of a portfolio • Includes feedback from the supervising instructor and the cooperating teacher • Requires a written commentary and artefacts to be submitted	Locally evaluated by supervising instructor
Task 2: Assessment and Data Collection to Measure and Inform Student Learning	Summative	• Requires candidates to demonstrate their understanding, analysis and application of assessment and data collection to measure and inform student learning • Focuses on the InTASC standards for using data both to inform instruction for the whole class and to meet individual learning needs • Requires a written commentary and artefacts to be submitted	Centrally scored anonymously by trained educators
Task 3: Designing Instruction for Student Learning	Summative	• Requires candidates to demonstrate their ability to develop instruction, including the use of technology, to facilitate student learning both for the whole class and for students with individual learning needs • Focuses on InTASC standards for classroom instruction, including the use of technology • Requires a written commentary and artefacts to be submitted	Centrally scored anonymously by trained educators
Task 4: Implementing and Analyzing Instruction to Promote Student Learning	Summative	• Requires candidates to demonstrate their ability to plan and implement a lesson and includes a 15-minute video of the candidate teaching a lesson. • Focuses on the ability to use research-based instructional strategies and adapt instruction for individual needs • Assesses a range of standards with some overlap from other tasks • Reflects on overall teaching practice • Requires a written commentary and artefacts, including a 15-minute video submission	Centrally scored anonymously by trained educators

4.3 Deakin Authentic Teacher Assessment

The Deakin Authentic Teacher Assessment (*ATA*) process (Dixon, Meyer, Gallant & Collard, 2011) has taken up some of the features of the *PACT*/*edTPA* assessment process, and linked the assessments to the Victorian Institute of Teaching Standards and the Australian Professional Standards for Teachers.

The *ATA* is a capstone assessment, designed to assess readiness for teaching (Allard, Meyer & Moss, 2013). Undertaken as part of the final practicum unit in the Master of Teaching program, the *ATA* portfolio is allocated 90% of the marks in the unit. The final 10% is allocated for the placement grade on a pass/fail basis. Students must pass both the placement and *ATA* components of the course.

Students are assessed on the basis of a set of documents assembled around

a sequence of five to eight lessons taught in the final practicum. Lesson plans, students' work, classroom videos and personal reflections are assembled to demonstrate students' achievement of the Standards. Figure 19 provides an overview of the *Deakin ATA* tasks.

Figure 19. Overview of *ATA* tasks

Section	Task	Artefacts	Length	VIT Standards
1. Context for Learning	Description of school and community	• ABS, ICSEA data • 4-6 photographs • Journal entries	500 words	3.2 3.3 3.4
2. Planning and Teaching	Commentary on rationale, planning, curriculum, teaching strategies and learning theories	• Data tables on class composition and character • Lesson plans • Journal entries	1,500 words	4.1 4.2 4.4 4.6
3. Teaching Students and Supporting Learning	Commentary on students; engagement, teaching strategies	• 10 minutes unedited video • Journal entries	1,000 words	7.1 7.2
4. Assessing Student Learning	Analysis of whole class and individual achievement	• Table of assessment tasks and criteria • Three work samples showing student feedback	1,500 words	4.2 4.3 4.4 6.4
5. Reflecting on Teaching and Learning	Reflective commentary on students as learners and readiness to teach	• Journal entries	1,500 words	7.1

At the heart of the *ATA* portfolio is a 10-minute video of teaching. Students are asked to select a continuous and unedited excerpt that illustrates the teacher's interaction with students while they are engaged in learning. In practice, almost all videos are static shots focused on the teacher's instructional talk. High quality IT resources are essential to the success of the *ATA*, for at least two reasons. At assessment time, it must be possible for hundreds of videos to be submitted, stored securely and later retrieved for assessment. In addition, digital assessment resources are essential in off-campus teacher education programs, a growing sector of teacher education. A sample ATA video is available here.

Unlike the externally assessed and moderated performance assessments of teaching in the United States, the Deakin *ATAs* are assessed by the instructors responsible for the final practical unit as part of their regular workload. Each *ATA* is marked once, unless the first marker regards it as a Fail or a High Distinction. These *ATA's* are double marked. Within each of the three Master of teaching programs at Deakin (primary, ECE/primary and secondary) the *ATA* portfolios are generic (rather than subject specific). Secondary ATAs are not necessarily assessed by subject experts. A comprehensive assessment rubric lays out the basis for scoring. The current rubric is a much-simplified version of the rubric used in the early years of the *ATA* (see Dixon *et al*, 2011, pp. 76-82). Figure 20 provides an example of the current scoring rubric, for Section 3: Teaching and Learning.

Figure 20. *ATA* assessment rubric (excerpt)

Section 3: Teaching for Learning	Range	Mark
Teaching and learning critically draws on student's prior learning, experiences, interests, perspectives and strengths to achieve teaching and learning goals. The creation of challenging learning environments and engagement of students in their learning is shown and analysed. Well-integrated pedagogy and teaching and learning strategies are personalised to address learning needs and approach to actively engage all learners is explained.	16—20	
Teaching and learning draws on student's prior learning, experiences, interests, perspectives and strengths to achieve teaching and learning goals. The creation of challenging learning environments and engagement of students in their learning is shown. Well-integrated pedagogy with teaching and learning strategies are tailored to address learning needs and approach to actively engage all learners is explained.	13.9—15.9	
Teaching and learning draws on student's prior learning, experiences, interests, perspectives and strengths to achieve teaching and learning goals. The creation of challenging learning environments and engagement of students in their learning is not shown. Well-integrated pedagogy with teaching and learning strategies addresses learning needs and the engagement of all learners is not explained.	10.1—13.8	
Teaching and learning excludes understanding of student's prior learning, experiences, interests, perspectives and strengths. The creation of challenging learning environments and engagement of students in their learning is not shown. Pedagogy and teaching and learning strategies not tailored to address learning needs and the engagement of all learners.	0—9.9	

The strength of the Deakin *ATA* is that it focuses on the complexities of practice. Students, teachers and teacher mentors regard it as authentic, fair and effective in demonstrating the achievement of the Standards, according to the 2011 review conducted for the Victorian Institute of Teaching (Dixon *et al*, 2011).

The 2011 review confirmed the content and construct validity of the ATA. One potential point of weakness was concurrent validity, where several students with excellent evaluations from other sources performed poorly on the ATA due to lack of reflective skills or the capacity to write convincingly about their experience. Such false negatives, however, do not appear to have been a problem as the program has matured. Another potential weakness lies in the typically static-camera, teacher-talk focus of the videos. Such videos provide better evidence of teacher's whole-class organisational skills and content knowledge than, for example, their capacity to scaffold individual students' learning.

Although there has been no quantitative assessment of the reliability of the *ATA* assessment procedures, a recent paper has conducted a qualitative analysis of six portfolios, concluding that approaches such as the Deakin *ATA*:

> should be reliable enough to be 'read' by external assessors (and moderated across other teacher education institutions). Rigorous research on a national basis is called for in order to develop and implement a structured portfolio as rich evidence of graduates' quality and capacity to teach. (Allard, Mayer & Moss, 2013, p. 425)

4.4 Melbourne Clinical Praxis Exam

The Clinical Praxis Exam *(CPE)* is part of a suite of initiatives undertaken in the University of Melbourne's Master of Teaching (MTeach). Consistent with a broader global turn towards research-informed clinical practice (Burn & Mutton, 2013), the Melbourne MTeach program builds on the design principles of the Carnegie Corporation's *Teachers for a new era* (2001) and other exemplary teacher education programs (McLean Davies, Anderson, Deans, Dinham, Griffin, Kameniar, Page, Reid, Rickards, Tayler & Tyler, 2013).
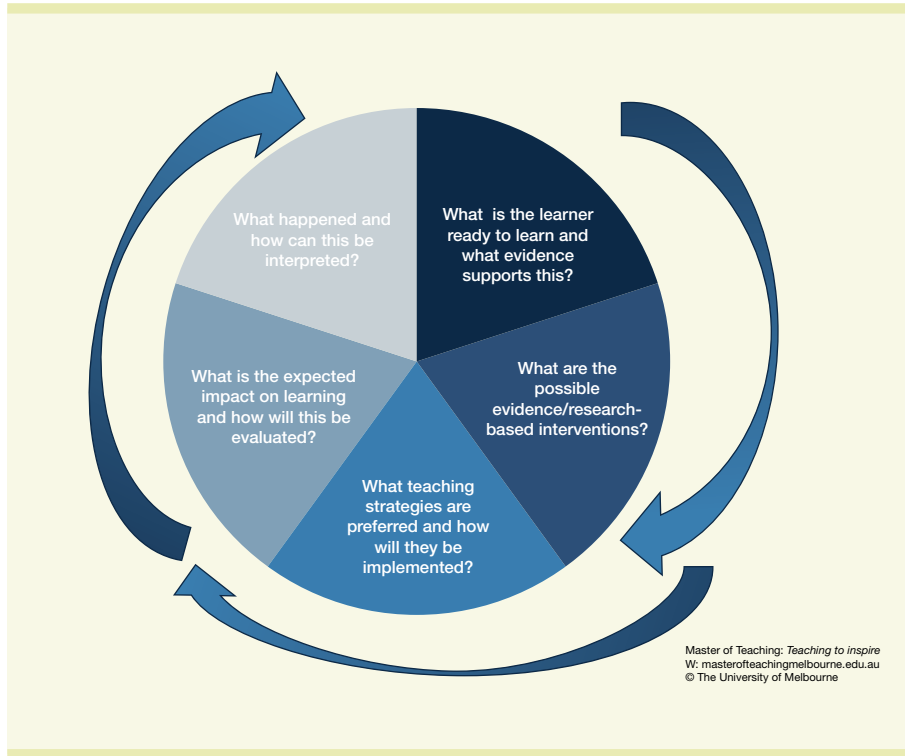
Characteristics of the MTeach include early immersion of students in partner schools; support from a network of teaching fellows in schools and clinical experts in the university; and a focus on developing the skills of 'clinical reasoning'. Clinical reasoning is characterised as "the analytical and intuitive cognitive processes that professionals use to arrive at a best judged ethical response in a specific practice-based context" (Kriewaldt & Turnidge, 2013, p. 107). In order to support development of students' clinical teaching, a five-stage taxonomy of clinical judgement has been produced.[39] The current form of this appears in Figure 21.

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[39] <http://website.education.wisc.edu/inei/wp-content/uploads/Documents/2012_Field_Rickards_MGSE.pdf>

Figure 21. Melbourne Taxonomy for Clinical Teaching

What is the learner ready to learn and what evidence supports this?

What are the possible evidence/research-based interventions?

What teaching strategies are preferred and how will they be implemented?

What is the expected impact on learning and how will this be evaluated?

What happened and how can this be interpreted?

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The *CPE* initially emerged from the need to bring into dialogue the "philosophical and ideological differences" of three academic subjects taken in the first semester of the secondary MTeach, "one examining the social and policy contexts of education through a sociological lens; one examining learning, teaching and pedagogy through a psychological lens; and the third examining language and literacy across the school curriculum through a functional-linguistic lens" (McLean Davies *et al*, 2013, p. 99). Conceived as a common assessment task, contributing to 40% of the assessment of each of the three academic subjects, the *CPE* has developed into an essential part of Melbourne's approach to teacher education. Figure 22 provides a graphic representation of the role of the *CPE* in integrating theory and practice in the first semester of the secondary MTeach program.

Figure 22. *CPE* and other program components
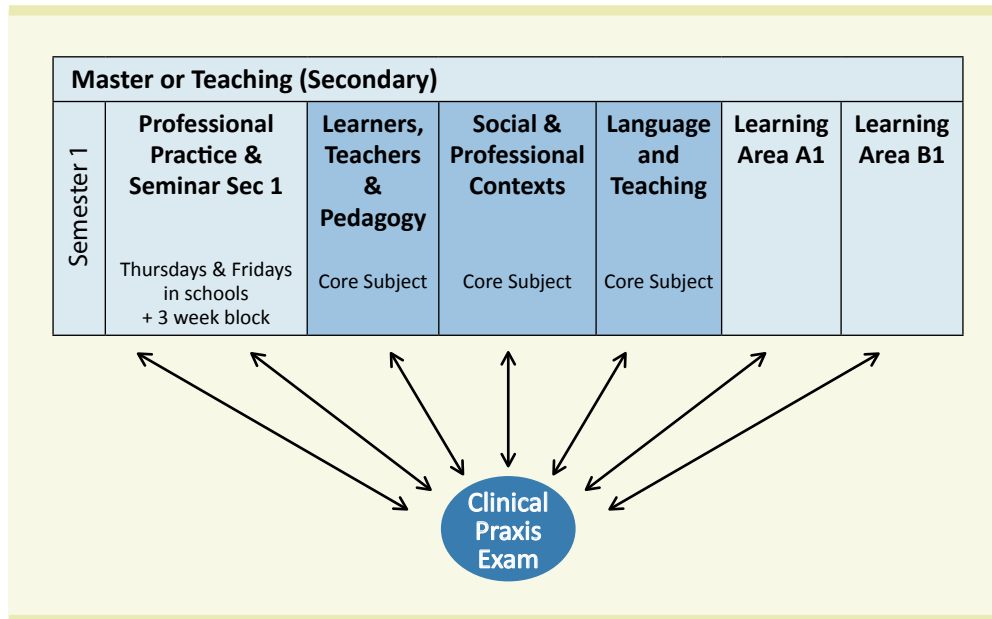
Separate procedures have been developed for Melbourne's early childhood, primary and secondary MTeach programs. In the secondary program, for example, pre-service students develop a series of clinical interventions. They identify a target school student, undertake a diagnostic assessment, explain and justify why the area to be developed is important, undertake a review of the literature and resources, design and implement a series of interventions and teach and monitor a series of interventions for the identified student in the context of over a period of at least five lessons of whole-class practicum teaching. Subsequently they present a 20-minute oral report to a panel of three university and school staff and spend 10 minutes answering questions posed by the panel. A short video explaining the CPE is available here and a sample student presentation is available here.

Secondary MTeach students are assessed on their capacity to integrate theory, research and practice, using a protocol based on the Biggs and Collis SOLO taxonomy of learning outcomes (1982): pre-structural, uni-structural, multi-structural, relational and extended abstract. Figure 23 contains the assessment rubric for the relational level of achievement on the SOLO taxonomy, awarded the grade of H2A.

Figure 23. *CPE* SOLO assessment rubric, relational level (H2A)

The teacher candidate's presentation demonstrated the integration of a range of concepts drawn from the three core subjects to plan, implement and evaluate a coherent series of interventions.

- Judgements about the impact of each of the variables on the development of the student's knowledge and/or skill/s were shown.

- The design of the series of interventions was formulated with clear connections to the key concepts of learning and teaching as they were discussed in the core subjects.

- Assessments were valid. Data/evidence/findings and pedagogical practices were compared and contrasted and used to inform practice.

- The evaluation demonstrated a critical reflection of the series of interventions in relation to theory, literature and/or resources. Understanding of the implications of interventionist practice for a broader educational context was shown.

- The presentation was logically structured and cohesive, and communication strategies were targeted appropriately to audience and purpose.

The MTeach primary program has expanded the use of the *CPE*, including it as a major assessment task in the placement subjects taken in the first three semesters of the program: Learners, Teacher and Pedagogy; Assessment, Learning and Teaching; and Social and Professional Contexts. Candidates are required to "design, implement and evaluate a personalised learning program and then present and justify the intervention to a panel of university and school-based assessors" (McLean Davies *et al* 2013, p. 100-1). Like the secondary *CPE*, the primary assessment rubric is based on the SOLO taxonomy.

The MTeach early childhood program takes a similar approach to the primary program, requiring a *CPE* in the Professional Practice and Seminar subject taken in each of the first three semesters of the program. Instead of the SOLO taxonomy used in the primary and secondary programs, the *CPE* assessment reflects two empirical measures widely used in the program: the Classroom Assessment Scoring System (CLASS) (Pianta *et al*, 2008) and the Abecedarian Approach (Sparling, 2007).

Challenges faced in implementing the *CPE* include the difficulty of providing feedback from the oral assessments, and of developing a sufficiently large pool of assessors equipped to reliably ask clinical questions (McLean Davies *et al*, 2013). The considerable workload implications of a 30-minute oral assessment for every student have been managed through the use of CPE marks as a major component of assessment in multiple units taken in the same semester in the secondary program.

Research reported by McLean Davies and her colleagues (2013) indicates that the *CPE* process increased students' diagnostic skills, their capacity for appropriate interventions and their confidence in speaking about their practice in an informed way. The success of the *CPE* in drawing together the elements of Melbourne's clinical teaching approach has encouraged staff to plan a capstone final year authentic clinical assessment, a project that has been funded by the Victorian Department of Education and Early Childhood Development (but not yet undertaken).

5. Discussion and policy implications

5.1 Basic skills assessments

There are dozens of basic skills assessments designed for teacher education candidates. In some US jurisdictions basic skills assessments are required by state regulators before entry to an approved initial teacher education program; in other jurisdictions passing scores on the assessments are required before an entry-level teaching license can be issued. The same assessments are used for both purposes. Pearson or ETS are the major providers of these assessments, whether through the national *Praxis* (ETS) or *Essential Academic Skills* (Pearson) programs, or state-based programs such as *WEST-B* (Washington), *ALS* (New York) or *CBEST* (California).

Despite the variety of assessment regimes and providers, US test content and organisation is very similar. Separate subtests are provided for reading, writing and mathematics, typically containing 40-60 multiple-choice items in each subtest. Extended essay responses are required in writing tests. Total test time for all three subtests range from four to six hours, and costs range from $102-$155.

The UK professional skills assessments are a little different from the US basic skills assessments. Rather than assessing generic skills, they test the literacy and numeracy skills required to do teachers' professional work. The assessments were originally designed as exit assessments, required for teacher registration, but they are now on-entry assessments. The total test time for the two assessments is a little over an hour and a half. The assessments are offered free to all to all teacher education candidates.

Basic skills assessments can be characterised as having two purposes: deterrence and prediction. The deterrence effect lies in the fact that 10-20% of candidates fail on-entry basic skills assessments: *Praxis PPST* pass rates range from 77% for writing to 85% fro reading; *CBEST* pass rates are about 80%; and UK professional skills assessments pass rates have been lowered from 98% to 93% in recent years. The potential problem with deterrence is that on-entry assessment may exclude candidates who have relatively poor academic skills but also have the capacity and desire to improve their skills.

The second purpose of basic skills assessment is prediction. The evidence is that candidates who enter with low basic skills scores improve their performance as a consequence of being in an academic the program. In the UK professional skills assessments, for example, the pass rate for on-exit test-takers was almost 4% higher than on-entry test-takers in 2012-13. But there is strong US evidence that basic skills assessments are also predictive of performance in teacher education programs. An extensive analysis of *Praxis I*, *Praxis II* and college grade point averages demonstrated that individuals with borderline *Praxis I* (entry) scores are far less likely to pass *Praxis II* (exit) assessments. Interestingly, although *Praxis II* pass rates of African Americans are lower than white candidates, differences are minimal after taking account of college grades. In the words of the authors of this study, "struggling with basic skills tests is a harbinger of later difficulty" (Gitomer, Brown & Bonett, 2011).

There are three policy options for the application of basic skills assessments in teacher education.

1. Require a passing score as a condition of entry to an accredited teacher education program.

   - The benefit of this approach is deterrence: poorly prepared candidates who – on average – would not do well in the program are not admitted.

   - The risk is that some candidates who would be excluded might do well if they were admitted.

   - In Australia, basic skills assessment prior to entry is not a practical option. The settled policy is that universities control admission standards, not external regulators.

2. Require providers to undertake basic skills assessment as a condition of teacher education program accreditation.

   - The benefit of this approach is prediction: provided that universities choose to apply basic skills assessments early in the program they will be able to predict which students will struggle and provide them with additional support.

   - The risk is that accreditation procedures are not sufficiently strong to ensure that every single candidate meets a required standard. Regulators could check whether an institution was assessing literacy and numeracy at the point of reaccreditation, but this would not prevent programs from passing poorly prepared candidates who met university graduation requirements.

   - In Australia, assessment of literacy and numeracy has been accepted as a condition of accreditation and a basic skills assessment will be available for adoption in 2015.

3. Require a passing score as a condition of initial teacher registration.

   - The benefit of this approach is that it guarantees a level of basic skills without denying access to teacher education candidates who would not pass an on-entry assessment.

   - For universities, the risk is that they would graduate students who did not subsequently pass the basic skills assessment. As a matter of risk mitigation, universities would almost certainly require students to attempt the assessment early in their program and, if necessary, re-sit before graduation.

   - Provided that agreement could be reached among the state teacher registration authorities, this would be an effective option for Australia. Assessment early in the teacher education program would have a deterrence effect, occurring before candidates had invested too much in the program, as well as guaranteeing that every single person achieving initial teacher registration met a basic skills standard.

5.2 Content knowledge assessments

Content knowledge assessments are universally required in US jurisdictions for initial teaching licenses. The dominant provider of content knowledge assessments is ETS. Their *Praxis II* series provides more than 100 tests covering every imaginable phase of schooling and school subject. Pearson provides a smaller number of school phase and subject content assessments through the *Essential Academic Skills* program. The ETS and Pearson assessments take between two and four hours, are predominantly multiple-choice and cost between $50 and $150. State-based assessments, a speciality of Pearson, have similar organisation, costs and timing. California and New York, for example, each have a choice of more than 40 assessments, all provided by Pearson. The California chemistry test takes five hours, includes both multiple-choice and written questions, and costs a total of $207. The comparable New York test takes a little less time (four hours) and costs a little less ($119).

There are three policy options for the application of content knowledge assessments in teacher education.

1. Require content knowledge assessment.

   • This approach focuses responsibility for standards on the individual rather than the accredited program. Most US jurisdictions follow this approach.

   • For universities, the risk is that they prepare and graduate candidates who subsequently cannot pass an external assessment. This is a moral hazard for program providers, as well as a potential legal risk.

   • Universities, however, are self-accrediting institutions, responsible for maintenance of their own standards under the supervision of the Tertiary Education Quality Standards Agency. They may well resist the idea that a half-day multiple-choice assessment would provide more valid information on content knowledge than their entire three- or four-year degree program.

   • Highly specific content assessments such as *Praxis II* are unlikely to be adopted in Australia. The country is too small to afford production of somewhere between 40 and 100 phase and subject assessments, even if jurisdictions were willing to mandate and pay for them.

2. Require content knowledge assessment in selected subjects

   • Australia's state-based teacher registration procedures typically distinguish between specific phases of schooling and subjects in determining acceptability of applicants for registration.

   • Once teachers are registered, however, the phases of schooling and subjects they teach are a matter for employers and schools.

   • Teaching out-of-field is a significant problem in Australian schools. Some 8.7% of foreign language teachers, 7.2% of English teachers, 5.6% per cent of science teachers and 5.3% have received no formal education or training in their subject area.[40] If this situation were to deteriorate further, content knowledge assessments might reasonably be required in some subjects – but to do so would require a long and complex process of negotiation with jurisdictions and universities.

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[40] <https://www.education.gov.au/school-teacher-workforce-data-reports>

3. Rely on content requirements underwritten by teacher education accreditation and university course grades.

- This approach focuses responsibility for standards on the accredited program, rather than the individual candidate.

- Few US jurisdictions follow this approach, with most preferring separate assessment of the content knowledge required in each subject or phase of schooling. This practice reflects the wide range in standards of the US's very disparate and stratified higher education system. In such a system, and in such a large country, regulators are rightly reluctant to rely on un-moderated academic grades.

- In Australia, this is the status quo option, consistent with our self-regulating higher education system.

5.3 Pedagogical knowledge assessments

Pedagogical knowledge assessments are also common in the US. Most of these are organised by phase of schooling. ETS's *Praxis Principles of Teaching and Learning* has separate forms for Early Childhood, K-6, 5-9 and 7-12. Pearson's *Assessment of Professional Knowledge* has an elementary and secondary form. Texas has a state-specific assessment, provided by ETS and covering all of early childhood to grade 12. Tests range from two to three hours, are predominantly multiple-choice supplemented by short or long written questions, and cost between $95 and $139.

There are at least two logical policy options regarding pedagogical knowledge assessments: introduce them or don't introduce them – but the arguments against introduction are much stronger.

1. Require pedagogical knowledge assessment.

- Most US jurisdictions require candidates to pass assessments of pedagogical knowledge before a teacher license is issued. In the context of extensive pre-licensing assessment programs, these tests cover an areas of knowledge not picked up in basic skills or content assessment. They make sense in terms of completeness of coverage.

- In Australia, where there are currently no standardised teacher assessments used within or across jurisdictions, the benefits of pedagogical knowledge assessment would have to be weighed against the benefits of teacher performance assessments, a more modern technique for measuring the development of teaching skills.

2. Rely on content requirements underwritten by teacher education accreditation and university course grades.

- Like assessments of content knowledge, pedagogical knowledge assessments may be resisted by Australia's self-accrediting universities.

- There are currently no standardised teacher assessments used within or across jurisdictions in Australian teacher education. New pedagogical content knowledge assessments would have a lower priority than basic skills assessments.

5.4 Performance assessments

Teacher performance assessments represent the latest wave of teacher assessments in the US. Unlike the pedagogical knowledge assessments, which test factual knowledge about such things as learning theory, differentiation strategies and assessment practices, performance assessments attempt to measure these things in action. In assessment jargon, they are authentic assessments.

There are two competing performance assessment programs in the US: Stanford University's *edTPA*, managed operationally by Pearson; and ETS's *Praxis Performance Assessment for Teachers*. *PPST* is a new assessment, still being refined and calibrated; *edTPA* is used by institutions in 37 US states and mandated by regulators in seven states. Both assessments require students in the final phase of their teacher education to develop portfolios that follow a class through a cycle of planning, teaching and assessment. Common components include unedited classroom teaching video, lesson plans, assessments, evidence of feedback, and reflection on learning. The ETS assessment is generic, with subject and phase of schooling differences being managed at the point of grading by content experts; *edTPA* is phase and subject specific, with 27 parallel forms available. *edTPA* costs $300 and *PPST* costs $275.

Of the two well-developed Australian performance assessments, Deakin's *ATA* bears the closest similarity to the US performance assessments. Drawing on the Californian *PACT*, since developed into the *edTPA*, the *ATA* is intended as a capstone assessment designed to determine whether candidates are "ready to teach". The VIT review noted a high level of acceptance of the instrument among staff and students and confirmed the content and construct validity of the *ATA*. With some further work on the issue of concurrent validity raised in the VIT review and some psychometric work on reliability, the ATA could be applied more widely in Australia. The *CPE* has a narrower focus, being designed to develop clinical reasoning during the teacher education program, rather than as a "ready to teach" capstone assessment, but has the significant advantage of scoring rubrics based on theoretically and empirically strong resources

The development of these new teacher performance assessments provides three policy alternatives.

1. Require completion of a national, moderated teacher performance assessment as a condition of teacher registration.

   - This is the high stakes option. There are currently no nationally comparable assessments of teacher education students' ability, achievement or performance. The process of developing the literacy and numeracy assessments has shown how hard it is to achieve consensus among universities and regulators. Nevertheless, the option of nationally moderated assessments, combined with public disclosure of proportion of candidates passing at each institution, is a tantalising option for those committed to empirical measurement of standards.

2. Require teacher performance assessment as a condition of program accreditation.

   - A lower stakes option would be to require institutions to use some kind of authentic performance assessment as a condition of accreditation. This would provide some internal opportunities for programs to improve their performance, but would lack the benefits of external moderation and transparency.

3. Promote development of a national moderated digital performance assessment for use in the last semester of teacher education.

    •   The existing *edTPA* and the new *PPST* take slightly different approaches and it remains to be seen which provides the most reliable, valid and parsimonious assessments.

    •   The Deakin *Authentic Teacher Assessment and Melbourne Clinical Praxis Examination* provide very useful Australian starting points for further development.

    •   There may be an opportunity to commission an Australian teacher performance assessment, building on the experience of local and national assessments.

6. Summary and Conclusions

This paper has identified four broad kinds of standardised assessments that are available for use in teacher education: basic skills; content knowledge; pedagogical knowledge; and teacher performance assessments.

Basic skills assessments, such as those used in the United States and England, may be applicable in the Australian context. The Australian Council for Educational Research has prepared new standardised assessments of professional literacy and numeracy for the Australian Institute for Teaching and School Leadership. These assessments are designed to assist teacher education providers in measuring the standards of literacy and numeracy specified in the national teacher education accreditation *Program Standard 3.2*, which requires that students achieve a standard equivalent to the top 30% of the population by the time they graduate. It may be that providers wish to use this assessment, or one like it, earlier in their programs as a means of identifying students who require extra support.

The standardised assessments used in the United States to test whether prospective teachers have the content knowledge required to teach in specific phases of schooling and subject areas are unlikely to be applicable in Australia. Universities are responsible, through the Tertiary Education Quality Standards Agency, for the standards of content knowledge of their students. Under these circumstances it would be difficult to argue that a half-day test of (say) chemistry content knowledge would provide more information about achievement than grades awarded in a three-year chemistry degree at an accredited higher education institution. Furthermore, content knowledge requirements have been specified in *Standard 4.4* and *4.5* of the recently negotiated national teacher education accreditation Program Standards.

The standardised pedagogical knowledge assessments used in the United States to test the knowledge required to teach in particular phases of schooling of secondary school subjects are unlikely to be applicable in Australia. Pedagogical knowledge requirements of students are already specified in the *Australian Professional Standards for Teachers'* Graduate Teacher Standards and the national teacher education accreditation Program Standards. Moreover, the benefit of introducing standardised assessments would have to be weighed against the benefits of introducing the sort of authentic teacher performance assessments that recently have been developed to assess the same domains of knowledge.

The new approach to authentic performance assessment demonstrated by *edTPA* and *PPST*, seems likely to be beneficial in the Australian context. There has already been some high quality Australian work developing authentic assessments of student teachers' performance, including the Deakin *Authentic Teacher Assessment* capstone assessment and the University of Melbourne *Clinical Praxis Exams*. At least three alternative policy options are available. One option would be to amend the accreditation standards to require that every program use an on-exit capstone authentic assessment of some kind. Another option would be to require every teacher education provider to use a specific capstone authentic performance assessment. The third option would

be to require that such assessments be nationally moderated and disclosed as part of the accreditation requirements. Building on the successes of the Deakin *ATA* and the Melbourne *CPE*, such an assessment could be developed, trialled, standardised and *made available* under the first option, or *specified* under the second option or *moderated* under the third option. But whichever option might ultimately be adopted, the development of a new, national capstone assessment of teacher performance would strengthen both the Graduate Teacher Standards and the accreditation Program Standards.

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Appendix 1: Basic skills assessments

Assessment	Test agency	Test form	Time	Questions	When taken?	Cost
Praxis CORE	ETS	Reading	60 minutes	45 multiple-choice	Entry or exit, depending on state requirements	$135
		Writing	100 minutes	40 multiple-choice 2 essays		
		Mathematics	85 minutes	56 multiple-choice		
Essential Academic Skills	Pearson	Reading	85 minutes	56 multiple-choice	Exit (Oregon)	$100
		Writing	75 minutes	40 multiple-choice 1 essay		
		Mathematics	85 minutes	56 multiple-choice		
WEST-B (Washington)	Pearson	Reading	2 hours	60 multiple-choice	Entry	$155
		Writing	2 hours	50 multiple-choice 2 written responses		
		Mathematics	2 hours	60 multiple-choice		
ALS (New York)	Pearson	Reading and writing	3 hours 35 minutes	40 multiple choice 2 short written answer 1 essay	Exit	$131
CBEST (California)	Pearson	Reading	4 hours	50 multiple-choice	Entry	$102
		Writing		Short written responses Essays		
		Mathematics		50 multiple-choice		
UK Professional Skills Tests	learndirect	Literacy in a professional context	45 minutes	4 sections	Entry	Free Resits £19.25
		Numeracy in a professional context	48 minutes	12 mental arithmetic 16 on-screen		

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Appendix 2: Content knowledge assessments

Assessment	Test agency	Test forms	Example	Time	Questions	Cost
Praxis II	ETS	>100 tests	Chemistry	2 hours 30 minutes	125 multiple-choice	$50–$150
Essential Academic Skills	Pearson	32 tests	Chemistry	3 hours 45 minutes	150 multiple-choice	$95
California Subject Examinations for Teachers	Pearson	>40 tests	Science + Chemistry specialism	5 hours	General science I: 58 multiple-choice 2 written questions	$69
					General science II: 58 multiple-choice 2 written questions	$69
					Chemistry: 58 multiple-choice 3 written questions	$69
Content Specialty Tests (New York)	Pearson	>40 tests	Chemistry	4 hours	90 multiple-choice 1 written response	$119

Appendix 3: Pedagogical knowledge assessments

Assessment	Test agency	Test forms	Example	Time	Questions	Cost
Praxis II Principles of Teaching and Learning	ETS	Early Childhood Grades K-6 Grades 5-9 Grades 7-12	Grades 7-12	2 hours	70 multiple-choice 4 constructed-choice	$139
TExES #160	ETS	Pedagogy and Professional Responsibilities EC-12	-	2 hours 30 minutes	100 multiple-choice questions	$120
NES Assessment of Professional Knowledge	Pearson	Elementary Secondary	Secondary	3 hours	100 multiple-choice 1 case study 1 written product	$95

Appendix 4: Teaching performance assessments

Assessment	Test agency	Test forms	Tasks	Content	Cost
edTPA	Stanford/ Pearson	27 parallel forms for phase of schooling and subjects	Task 1: Planning	• Lesson plans, • Teaching materials, • Assessments, • Commentary	$300
			Task 2: Instruction	• Unedited video recordings, • Commentary	
			Task 3: Assessment	• Samples of students' work • Evidence of feedback • Summary of student learning • Evaluation criteria • Student self reflections	
Praxis Performance Assessment for Teachers (PPAT)	ETS	Generic form; grading by phase and subject content experts	Task 1: Knowledge of students and the learning environment	• Creation of a portfolio • Feedback from the supervising instructor and cooperating teacher • Written commentary and artefacts	$275
			Task 2: Assessment and data collection to measure and inform student learning	• Written commentary and artefacts	
			Task 3: Designing instruction for student learning	• Written commentary and artefacts	
			Task 4: Implementing and analysing instruction to promote student learning	• 15 minute video submission • Written commentary and artefacts	

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Appendix 4: Teaching performance assessments (cont.)

Assessment	Test agency	Test forms	Tasks	Content	Cost
Authentic Teacher Assessment (ATA)	Deakin University	Generic	Task 1: Description of school and community	• ABS, ICSEA data • 4-6 photographs • Journal entries	Nil
			Task 2: Commentary on rationale, planning, curriculum, teaching strategies and learning theories	• Data tables on class composition and character • Lesson plans • Journal entries	
			Task 3: Commentary on students; engagement, teaching strategies	• 10 minutes unedited video • Journal entries	
			Task 4: Analysis of whole class and individual achievement	• Table of assessment tasks and criteria • Three work samples showing student feedback	
			Task 5: Reflective commentary on students as learners and readiness to teach	• Journal entries	
Clinical Praxis Exam (CPE)	Melbourne University	Phase but not subject specific	Develop a series of clinical interventions • Identify a target school student • Undertake a diagnostic assessment • Explain and justify why the area to be developed is important • Undertake a review of the literature and resources • Design a series of interventions over a period of at least five lessons • Teach and monitor a series of interventions for the identified student in the context of whole-class practicum teaching.	• Present a 20 minute oral report with no more than eight PowerPoint slides, followed by 10 minutes of questions from the panel	Nil