

# Incoherent by design: What you should know about differences between undergraduate and graduate training of elementary teachers

by Julie Greenberg and Natalie Dugan

## Introduction

Imagine yourself an elementary school principal considering applications from two recent graduates of a nearby university. One candidate has earned a bachelor's degree, while the other a master's degree.<sup>1</sup> Because both entered the same education school to learn how to teach at the identical starting line in terms of necessary coursework, you might expect their preparation to have been roughly the same.

You'd probably be wrong.

To understand the different approaches taken by programs housed on the same university campus, we examined 13 institutions that offer both a graduate and undergraduate program preparing new elementary and/or secondary teachers.<sup>2</sup> While we often find overlap in the topics each undergraduate/graduate program pair covers, what's more striking are the different course requirements — even though both programs are offered by the same education school at the same institution.

We undertook this examination after rating many, many more undergraduate and graduate programs for both the 2013 and 2014 *Teacher Prep Reviews*. In the *Review*, we were surprised to find big differences in how well these programs, housed on the same campus, did on NCTQ's standards. (It's why we think states like **Tennessee** and **Ohio** are making a big mistake reporting a value-added score for an institution that combines results for teachers produced by both undergraduate and graduate programs, rather than a separate score for each type of program.) This recent exercise was more agnostic than comparing how programs scored on a set of standards; we simply wanted to find out if programs agreed on the core courses needed by elementary or secondary teachers.

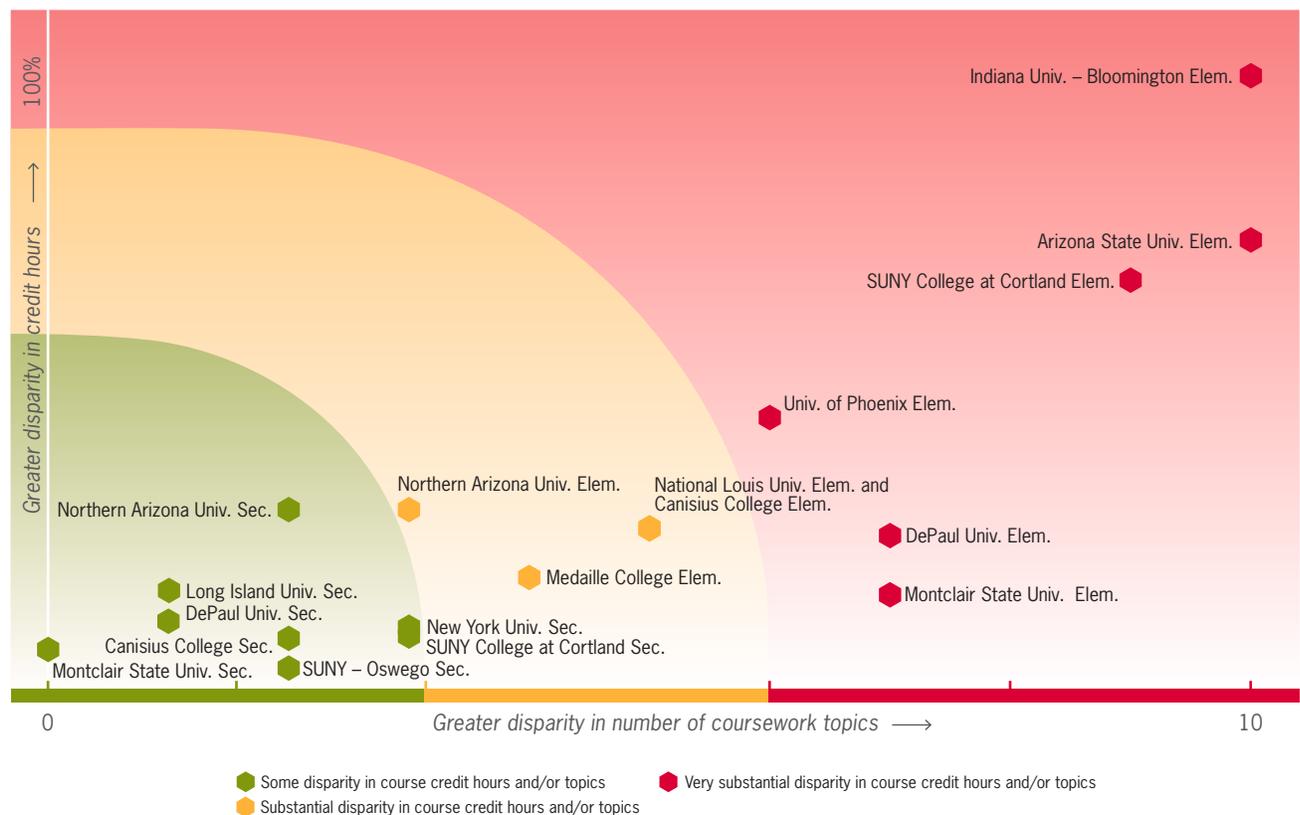
## An overview of differences in elementary and secondary teacher preparation program pairs

The graphic below pairs 18 programs training the same kinds of teachers at 13 institutions, all producing a large number of teachers each year. An undergraduate program is matched with a graduate program at each institution. The results show big differences in both the professional content that is covered and the number of credit hours required for the content.

Note that in our consideration of “professional content covered” we did not include any required course offered outside of the education school unless the course is designed solely for teacher candidates — for example a science department course entitled “Biological Science for Elementary Teachers.” On what grounds do we count non-education content courses designed for teachers — nearly all of which are found in undergraduate programs — and not count the non-education content course that a graduate candidate might be presumed to have taken as an undergraduate? The answer is simple: these education schools do not require that their applicants to graduate elementary programs demonstrate through a transcript review process or a test that they have taken or know the content offered in the relevant undergraduate non-education course.<sup>3</sup> There simply are no analogous coursework requirements for graduate candidates.

Figure 1 makes clear that differences in elementary program pairs are much more significant than those found in secondary program pairs, surfacing some clear evidence that the field has not reached even the most basic consensus over the topics that new elementary teachers need to cover in their coursework.

**Fig. 1 Approaches to teacher prep taken by the undergrad/grad programs on the same campus**



All of the pairs in the “green zone” on the graphic are secondary program pairs. All of the pairs that are in the orange or red zones of the graphic are elementary program pairs.



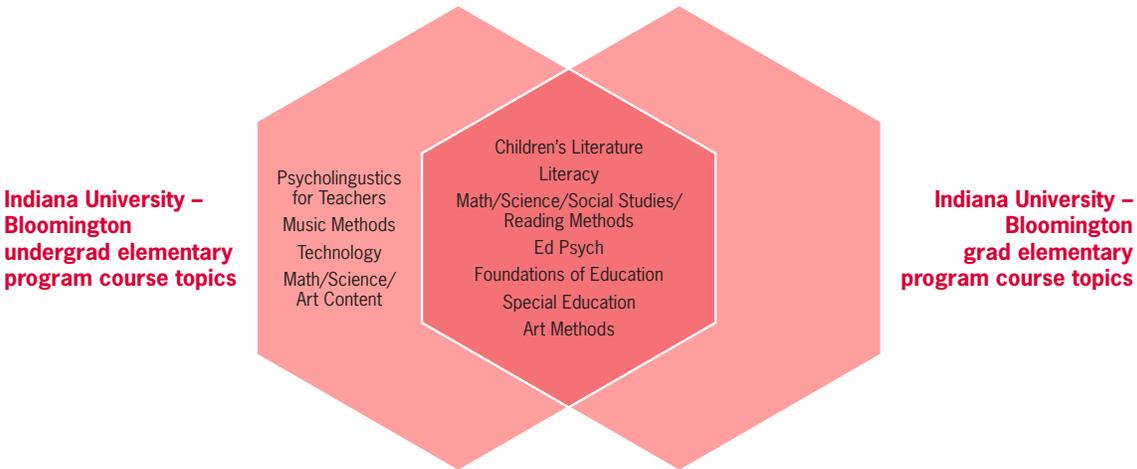
The horizontal axis in Figure 1 indicates the difference in the topics addressed in required professional coursework.<sup>4</sup> Program pairs on the left side of the axis differ very little in topics addressed; program pairs on the right side differ considerably, with the program pairs furthest to the right (**Indiana University – Bloomington**'s and **Arizona State University**'s elementary program pairs) each differing by 10 topics. In other words, in each of these two institutions, we found as many as 10 topics that are taught to undergraduate candidates or graduate candidates, but not to both.

The vertical axis in Figure 1 indicates the difference in the number of required professional course credits. Program pairs at the lower end of the axis require almost the same number of credits; program pairs at the upper end differ considerably, with the program pair highest up the axis (**Indiana University – Bloomington**'s elementary program pair) differing by 95 percent — the undergraduate program requiring 80 credits (about 27 courses) and the graduate requiring 41 credits (about 14 courses).

Figures 2, 3, and 4 take closer looks at the three elementary program pairs that differ the most on both dimensions (the amount of required professional coursework and the topics covered): **Indiana University – Bloomington**, **Arizona State University** and **SUNY College at Cortland**. Shared coursework topics are shown in the overlap of the hexagons, with coursework topics unique to the undergraduate program on the left and coursework topics unique to the graduate program on the right.

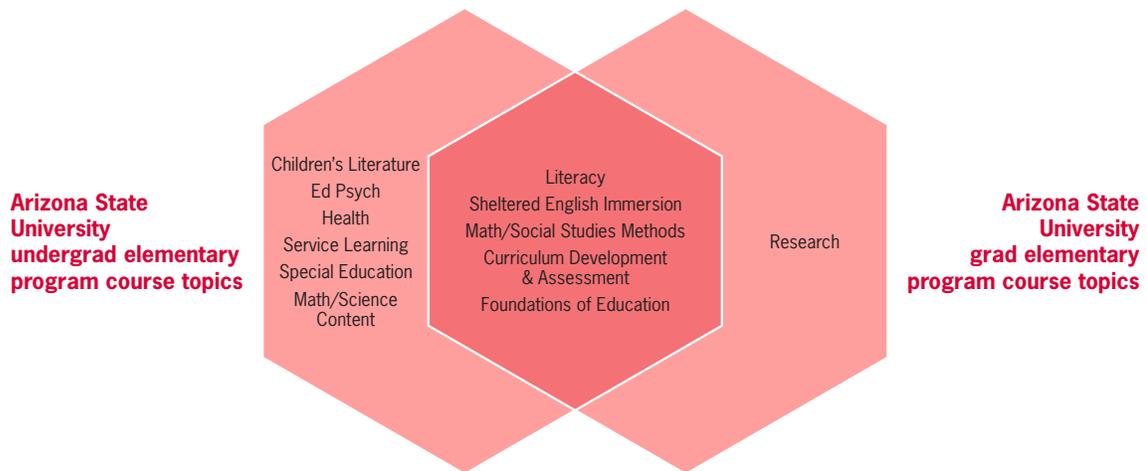
The disagreements are not minor. It's not hard to see that faculty at the same university clearly do not agree on what defines a prepared teacher candidate.

**Fig. 2 The very substantially disparate approaches taken by two programs on the same campus to prepare elementary teachers**



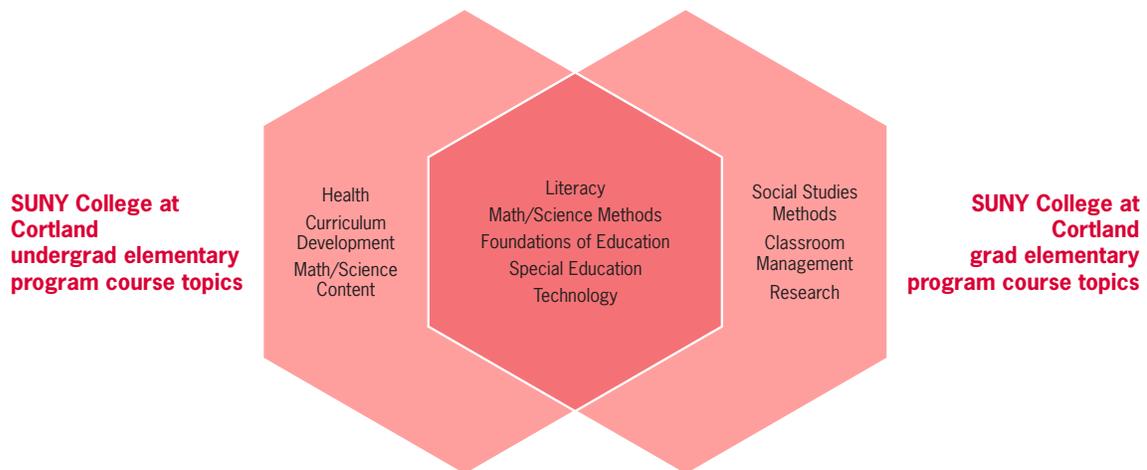
*Indiana University – Bloomington's graduate elementary program requires 41 credits; the undergraduate program requires 80 credits, 95 percent more. Courses in the undergraduate program address six topics not addressed in graduate program coursework.*

**Fig. 3 The very substantially disparate approaches taken by two programs on the same campus to prepare elementary teachers**



*Arizona State University's graduate elementary program requires 36 credits; the undergraduate program requires 61 credits, 69 percent more. Courses in the undergraduate program address seven topics not addressed in graduate program coursework; a course in the graduate program addresses one topic not addressed in undergraduate program coursework.*

**Fig. 4 The very substantially disparate approaches taken by two programs on the same campus to prepare elementary teachers**



*SUNY College at Cortland's graduate elementary program requires 38 credits; the undergraduate program requires 62 credits, 63 percent more. Courses in the undergraduate program address four topics not addressed in graduate program coursework; courses in the graduate program address three topics not addressed in undergraduate program coursework.*



## More on differences in elementary program pairs

Across all program pairs examined, the difference in professional coursework credit between the graduate and undergraduate program is, on average, just under seven courses (20 credits), with the undergraduate program — not surprisingly — requiring more coursework credit in every case.

In terms of topic differences, some are stark and/or deal with topics that would seem to be critical to preparation. For example, **Canisius College**, **DePaul University**, and **SUNY College at Cortland** require candidates in one of their elementary programs to take a course in classroom management, but do not require the course of candidates in the other program. Coursework at **DePaul University**, **Arizona State University** and **Indiana University – Bloomington** shows the same differences with regard to an introductory special education course.

Some of the most significant and consequential differences involve elementary math content courses, as well as research methods courses.

### Elementary math

In all three of the elementary program pairs depicted in the graphics above, undergraduate candidates are required to take elementary math courses that are not required of graduate candidates. This pattern is replicated in virtually all of the elementary pairs.

Institution	Elementary math content required in undergrad program	Elementary math content required in grad program
Canisius College	X	X
Arizona State University	X	
Indiana University – Bloomington	X	
Montclair State University	X	
SUNY College at Cortland	X	
DePaul University	X	
Medaille College	X	
National Louis University	X	
Northern Arizona University	X	
University of Phoenix	X	

These case studies show the same pattern demonstrated in the 241 graduate elementary programs we have evaluated in *Teacher Prep Review 2014* on the Elementary Math Standard: elementary content math coursework is rarely required in graduate programs, even by an institution that may require of undergraduate candidates as many as three courses on the topic.

There are no grounds to assume that graduate candidates know elementary math *concepts* because they are college graduates. Even if they had taken college math courses, the kind of content a teacher needs to teach elementary math isn't something a typical graduate student will have had — unless they had already been training to become a teacher. Math courses for elementary teachers need to be specifically geared to elementary teaching.

## Research methods

More surprisingly, in spite of the fact that undergraduate programs can stretch longer and therefore can offer a lot more courses, the graduate programs often require a research methods course that is nowhere to be found in the same institution's undergraduate program. A total of six graduate programs of the 10 elementary program pairs in the sample require a research methods course, a course that would be appropriate only in graduate programs offering advanced certification. Because graduate programs for initial certification are shorter than undergraduate initial certification programs (averaging three rather than four semesters), including a research methods course also necessarily supplants coursework that could be more useful for teacher training.

## Do differences matter?

Are these differences in program pairs simply superficial, with each program in a pair actually providing identical instruction? For example, might a topic such as classroom management provided in a discrete course in one program simply be embedded in numerous other courses in the corresponding program? This might be possible if program pairs required identical amounts of coursework — but they do not. In other words, if the credits of coursework were identical, it might be plausible that the packaging of the content was the only difference.

More importantly, it is very unlikely that two programs can deliver the same instruction when coursework configurations are so disparate that in one the instruction is self-advertised by course title and/or significant reference in a description, and in the other it does not even figure significantly in a course description. Inherently, instruction will be altered if, for example, in one program one instructor addresses classroom management whereas in another program three different instructors address it in three different methods courses.

But even if one believed that disparate configurations can lead to instructionally identical programs, no good purpose is served by doing so. In fact, given that the best data available to teacher preparation program administrators on teacher effectiveness is provided at an institutional level that addresses the effectiveness of graduates produced across numerous programs, differences in programs make it that much more difficult to ascertain where problems in preparation might lie and how they might be resolved.

## Conclusion

The types of differences identified here in program pairs have shown themselves to be ubiquitous. Were the differences only to be found in the paired elementary programs' *quantity* of required coursework, one might attribute them to the greater capacity of undergraduate programs to expand to fill a full two years (or more), and indeed that is probably a part of the explanation of the differences. But because the differences extend to the *types* of coursework required, any explanation that only addresses quantity of coursework is insufficient.

It may be that the other differences between undergraduate and graduate programs can be partly attributed to a popular theory within the field of teacher education that it is not the field's mission to convey a specific set of professional skills for which a specific set of courses is essential. Instead, teacher education sees its mission as creating professional identities for which a range of activities can often take place in one course as easily as another.



Differences between undergraduate and graduate programs in elementary mathematics are especially deserving of attention. Perhaps the notion of adding undergraduate content coursework in a mathematics department to requirements for graduate-level professional coursework seems to program administrators to be an unnatural fit. Nonetheless, the coursework is as essential to all elementary teacher candidates as an organic chemistry course is to a medical student.

This analysis does not consider which, if either, of the elementary and secondary programs being compared in each pair offers superior training — the differences are simply made apparent. Ideally, teacher candidates in each program pair should receive preparation that is not only consistent, but also high quality in its design: For elementary programs, teacher candidates should begin teacher preparation having demonstrated sufficient mastery of a broad range of content — including literature and composition, history and geography, and the basic sciences — to be able to deliver robust instruction. Their training should address early reading, elementary math, classroom management, assessment and data, and methods and design of instruction. For secondary teachers, training should address methods specific to their subject, adolescent literacy, classroom management, and assessment and data. Teacher preparation is likely to only add value when each of these courses is an integral and inseparable part of training focused on specific skills.

## How we conducted the case studies

We attempted to compare elementary and/or secondary programs in large-producing institutions in which the programs were sufficiently comparable to make a valid comparison. If, for example, an undergraduate program was only offered with an endorsement but the graduate program was not, we did not include the pair in our sample. For secondary programs, we chose to compare programs preparing candidates to teach English/language arts.

The programs included, and the production of the institutions in each type of program, are listed in the table below:

Institution and programs evaluated	2011-12 total program completers (all programs) as reported for Title II
<b>Arizona State University:</b> B.A. Education: Elementary; M.Ed. Elementary Education	1,373
<b>Canisius College (NY):</b> B.A. Childhood Education; M.S. Childhood Education; B.A. Adolescent Education; M.S. Adolescent Education	437
<b>DePaul University (IL):</b> B.A. Elementary Education; M.A./M.Ed. Elementary Education; B.A./B.S. Secondary Education; M.A./M.Ed. Secondary Education	414
<b>Indiana University – Bloomington:</b> B.S. Elementary Education; Elementary Certification Master's Program	375
<b>Long Island University – C.W. Post (NY):</b> B.S. in Adolescent Education; M.S. in Adolescent Education	478
<b>Medaille College (NY):</b> B.S.Ed. Early Childhood; M.S.Ed. Elementary Education	332
<b>Montclair State University (NJ):</b> The Elementary Education Professional Sequence; MAT Elementary Education; B.A. in English with Teacher Certification (Preschool-Grade 12); MAT Secondary Education	715
<b>National Louis University (IL):</b> B.A. Elementary Education; M.A. Elementary Education	618
<b>New York University:</b> B.A. Teaching English; M.A. Teaching English	574
<b>Northern Arizona University:</b> B.S.Ed. Elementary Education; M.Ed. Elementary Education; B.S.Ed. Secondary Education; M.Ed. Secondary Education	722
<b>SUNY College at Cortland:</b> B.A. Childhood Education; M.S.T. Childhood Education; B.A. Adolescence Education: English; MAT Adolescence Education: English	612
<b>SUNY – Oswego:</b> B.A. English; M.A. English	395
<b>University of Phoenix (AZ):</b> B.S. Education/Elementary Teacher Education; M.A. Education/Elementary Teacher Education	2,095

We outlined degree requirements for all programs and asked institutions to confirm our lists of requirements and credit counts.<sup>5</sup> We tallied professional coursework credits for each program by counting as professional coursework the following:

- any education school course pre-requisite or course,
- any course taught outside the education school that is clearly designed for teachers (such as “Children’s Literature”), and
- any course in which teacher candidates comprise the majority of the course’s audience, such as some linguistics and grammar courses.

Because the commitment entailed in student teaching is standardized (a full semester placement) but the credit hours attributed to it are not, we counted student teaching uniformly as 12 credits.

If a program is housed in an institution on a quarter rather than a semester system, we counted three quarter hours of credit as two semester hours of credit.

The list of topics we used for categorization follows in Appendix A. We counted topics addressed by courses without regard to the amount of time devoted to the topic. For example, if one program on a campus requires both science methods and math methods courses, and the other program in the pair requires a course that combines the two topics, we counted the programs as addressing the same topics.

## Endnotes

- 1 The institutions were selected among large teacher-producers that offer comparable initial certification programs at both the undergraduate and graduate levels. While not randomly selected, they appear quite representative. For example, our analysis of professional coursework requirements at 255 undergraduate and 133 graduate elementary programs included in the *NCTQ Teacher Prep Review* finds that the average number of credits required by elementary programs in this small sample (63 for undergraduate programs and 46 for graduate) is matched exactly by the requirements of programs in that much larger sample.
- 2 Teacher preparation offers two different types of graduate programs: a master’s degree that provides initial certification to enter the classroom as a licensed teacher and a master’s degree that provides advanced certification to licensed teachers who are already in the classroom. Teacher candidates obtaining initial certification through master’s degrees arrive at their teacher preparation programs’ doorsteps with exactly the same level of professional training and expectations as their undergraduate counterparts who arrive at the same doorsteps as college juniors: both types of candidates have had no professional training and both seek to have the program recommend them for the same exact type of job in K-12 classrooms.
- 3 In *Teacher Prep Review 2014*, fewer than half (45 percent) of graduate elementary programs require that applicants have even one biology, chemistry or physical science course on their transcript. Except at **SUNY College at Cortland**, none of the graduate elementary programs examined here have a transcript review process examining content preparation; the SUNY program requires two math and two science courses of graduate applicants, but there is no specification in either case that the courses cover the content of the two elementary math and the two “integrated” science courses required of undergraduate candidates.
- 4 By “addressing topics” we mean that the topic is sufficiently significant to be mentioned in a course title and/or figure significantly in a description.
- 5 We received a confirmation only from Arizona State University and Indiana University – Bloomington.



## Appendix A:

### Examples of courses categorized under topic headings

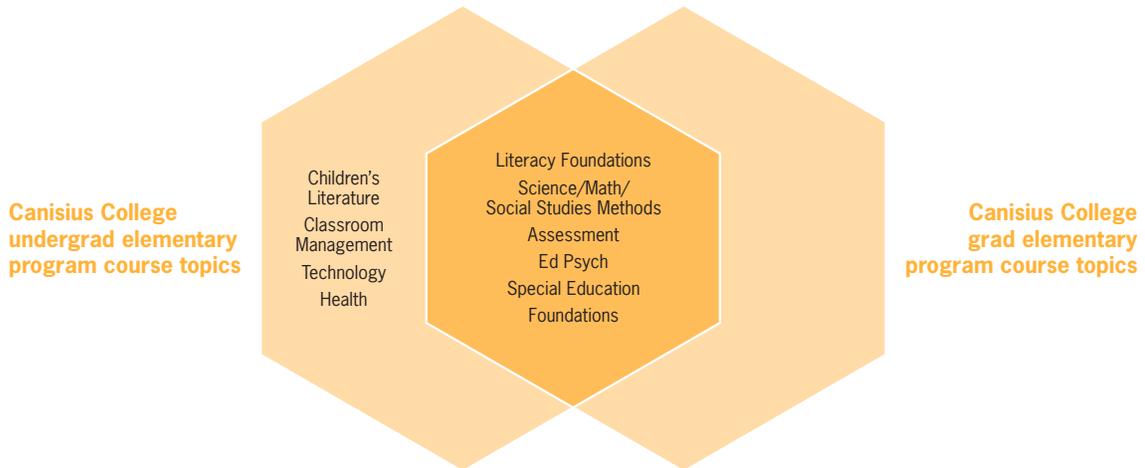
Topic heading in graphics	Examples of courses categorized under this topic
Foundations of Education	Philosophical Orientation to Education
	Perspectives on Early Childhood and Elementary Education in a Diverse Society
Special Education	Inclusive Strategies
	Introduction to Exceptional Children
Literacy	Children's Literature
	Disciplinary Literacy in English
	Literacy and Learning Content Areas
Language Arts Methods	Discipline Specific Methods: English Language Arts Grades 7-12
Math Methods	Elementary Methods: Math
Science Methods	Elementary Methods: Science
Social Studies Methods	Elementary Methods: Social Studies
Art Methods	Elementary Methods: Fine Arts
Music Methods	Teaching Music in the Elementary School
Classroom Management	Maintaining an Effective Learning Environment
	Managing the Early Childhood & Elementary Classroom
Health/Physical Education	Physiology and Hygiene
Technology	Technology in Education
	Integrating Media and Technology in the K-12 Curriculum
Research	Thesis Research in Teaching and Learning
Math Content	Investigation Space: Geometry, Measurement and Visualization
	Foundations of Mathematics for Elementary School Teachers I
Science Content	Sustainability for Science Teachers
Art Content	Art Experiences for the Elementary Teacher
Social Studies Content	Social Studies in Elementary Classrooms
Professional and Career Seminars	Professional Communications
Psycholinguistics, Grammar, and Speech	Psycholinguistics for Teachers
Educational Psychology	Human Development II: Early Adolescents and Adolescents
	Psychology and Development of the Adolescent
English Language Learners/English Immersion	Instruction to Structured English Immersion
	Structured English Immersion in Early Childhood Settings

# Appendix B

## Additional graphics

### ELEMENTARY PROGRAM PAIRS

The substantially disparate approaches taken by two programs on the same campus to prepare elementary teachers



*Canisius College's graduate elementary program requires 45 credits; the undergraduate program requires 56 credits, 24 percent more. Courses in the undergraduate program address four topics not addressed in graduate program coursework.*

The very substantially disparate approaches taken by two programs on the same campus to prepare elementary teachers



*DePaul University's graduate elementary program requires 56 credits; the undergraduate program requires 69 credits, 23 percent more. Courses in the undergraduate program address five topics not addressed in graduate program coursework; a course in the graduate program addresses one topic not addressed in undergraduate program coursework.*

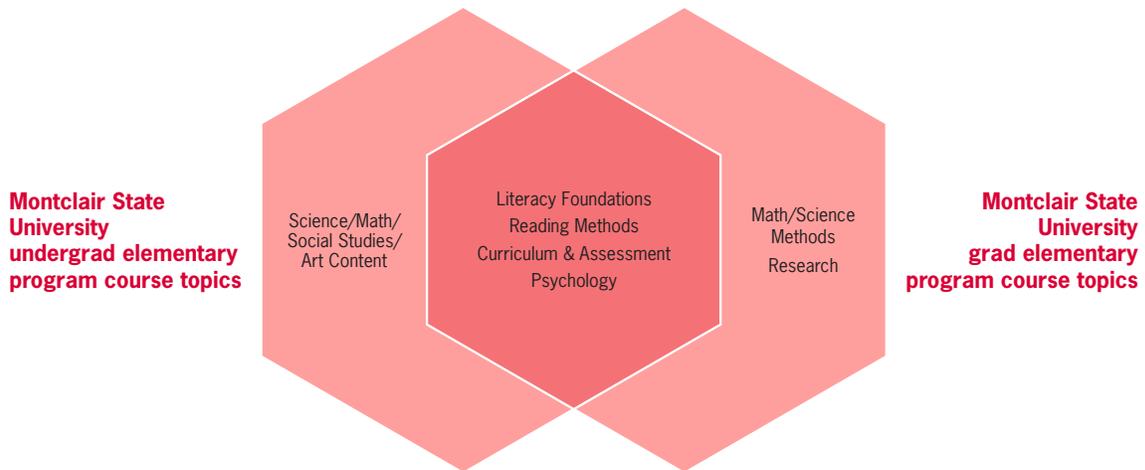


The substantially disparate approaches taken by two programs on the same campus to prepare elementary teachers



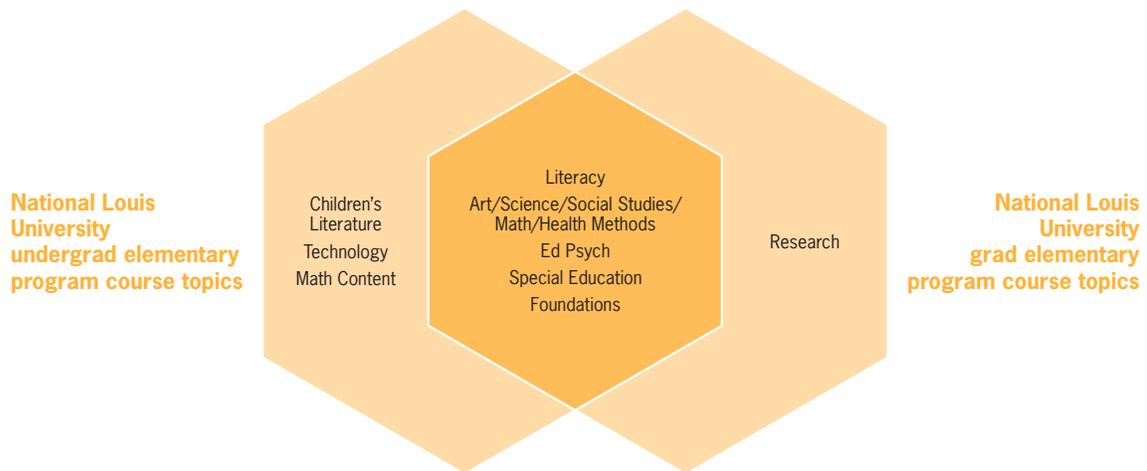
*Medaille College's graduate elementary program requires 54 credits; the undergraduate program requires 45 credits, 17 percent less. Courses in the undergraduate program address three topics not addressed in graduate program coursework; a course in the graduate program addresses one topic not addressed in undergraduate program coursework.*

The very substantially disparate approaches taken by two programs on the same campus to prepare elementary teachers



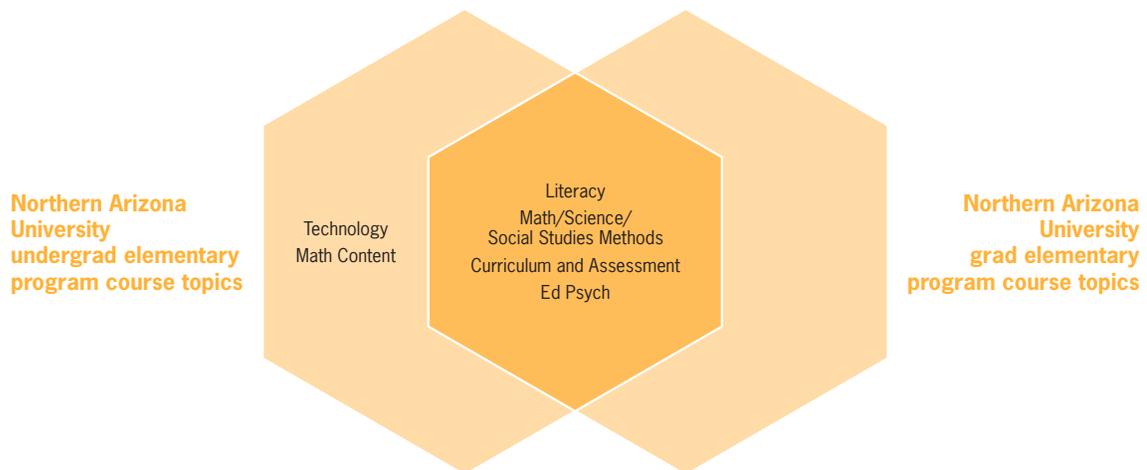
*Montclair State University's graduate elementary program requires 43 credits; the undergraduate program requires 49 credits, 14 percent more. Courses in the undergraduate program address four topics not addressed in graduate program coursework; courses in the graduate program address three topics not addressed in undergraduate program coursework.*

The substantially disparate approaches taken by two programs on the same campus to prepare elementary teachers



*National Louis University's graduate elementary program requires 33 credits; the undergraduate program requires 41 credits, 24 percent more. Courses in the undergraduate program address three topics not addressed in graduate program coursework; a course in the graduate program addresses one topic not addressed in undergraduate program coursework.*

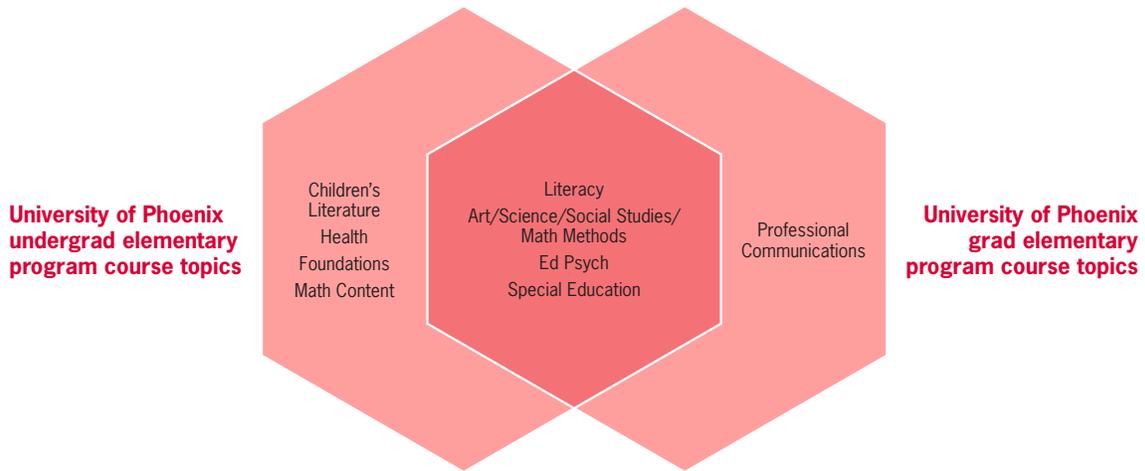
The substantially disparate approaches taken by two programs on the same campus to prepare elementary teachers



*Northern Arizona University's graduate elementary program requires 44 credits; the undergraduate program requires 56 credits, 27 percent more. Courses in the undergraduate program address two topics not addressed in graduate program coursework.*

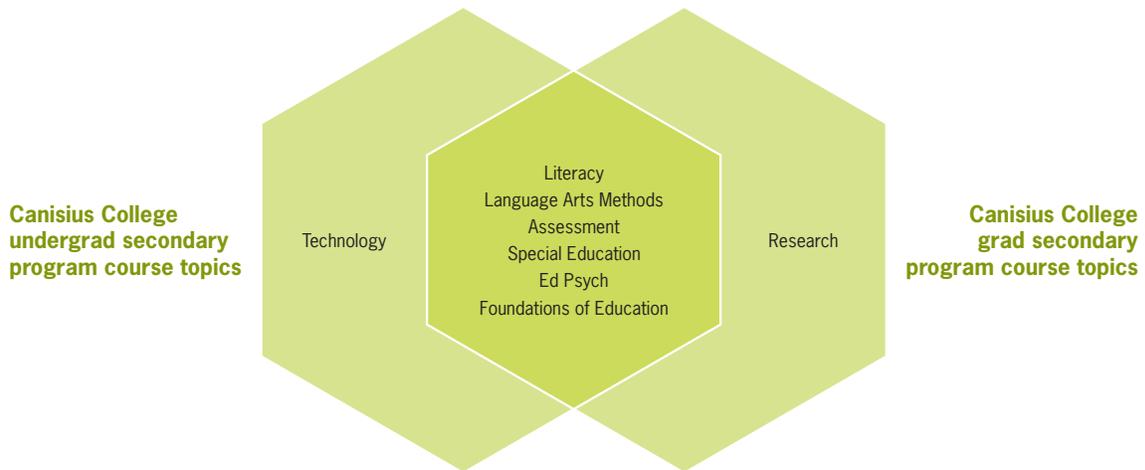


The very substantially disparate approaches taken by two programs on the same campus to prepare elementary teachers



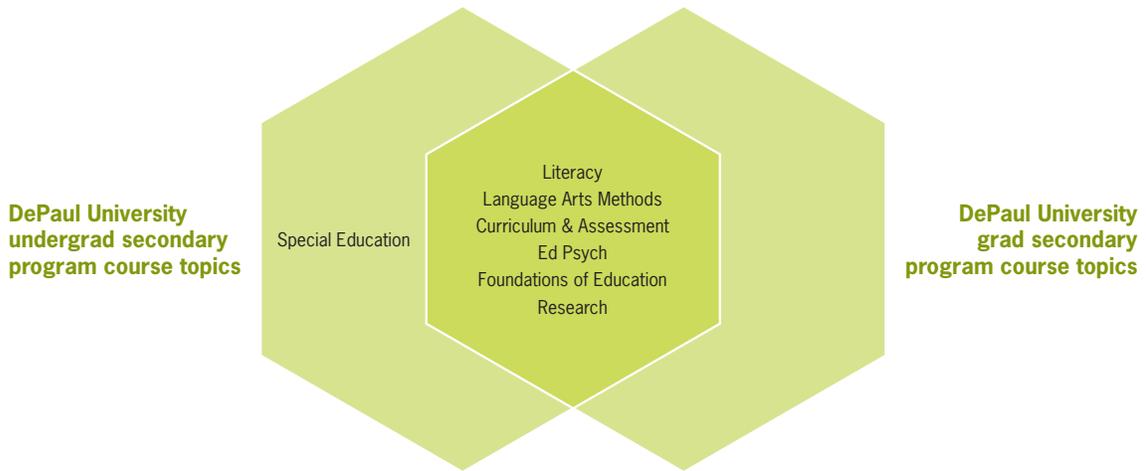
The University of Phoenix's graduate elementary program requires 72 credits; the undergraduate program requires 102 credits, 42 percent more. Courses in the undergraduate program address four topics not addressed in graduate program coursework; a course in the graduate program addresses one topic not addressed in undergraduate program coursework.

The largely similar approaches taken by two programs on the same campus to preparing secondary candidates



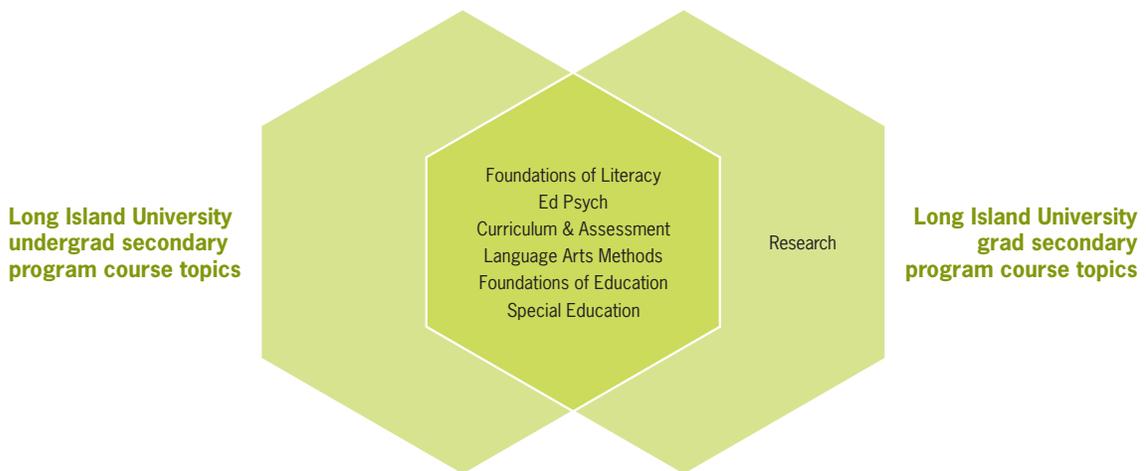
Canisius College's graduate secondary program requires 42 credits; the undergraduate program requires 45 credits, 7 percent more. A course in the undergraduate program addresses one topic not addressed in graduate program coursework; a course in the graduate program addresses one topic not addressed in undergraduate program coursework.

The largely similar approaches taken by two programs on the same campus to preparing secondary candidates



*DePaul University's graduate secondary program requires 56 credits; the undergraduate program requires 62 credits, 11 percent more. A course in the undergraduate program addresses one topic not addressed in graduate program coursework.*

The largely similar approaches taken by two programs on the same campus to preparing secondary candidates



*Long Island University's graduate secondary program requires 45 credits; the undergraduate program requires 52 credits, 16 percent more. A course in the graduate program addresses one topic not addressed in undergraduate program coursework.*

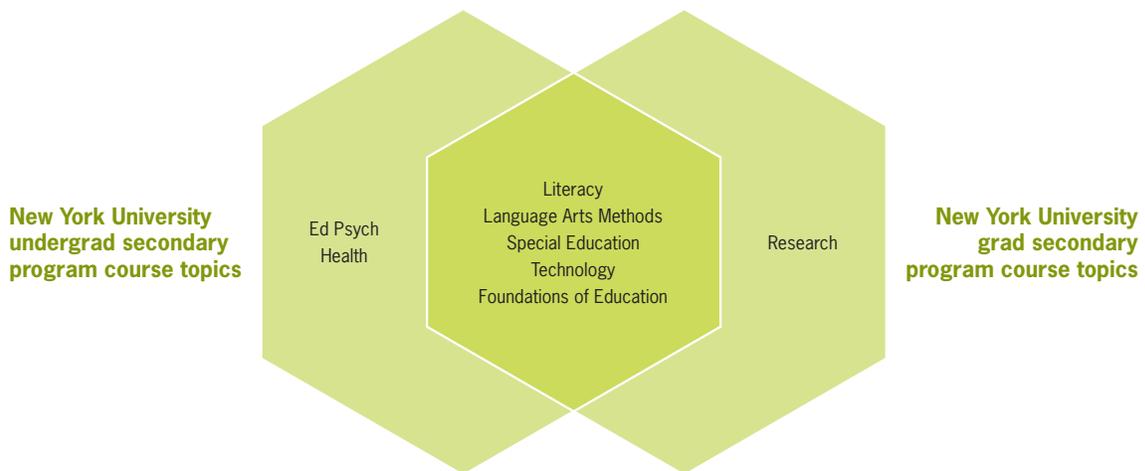


The largely similar approaches taken by two programs on the same campus to preparing secondary candidates



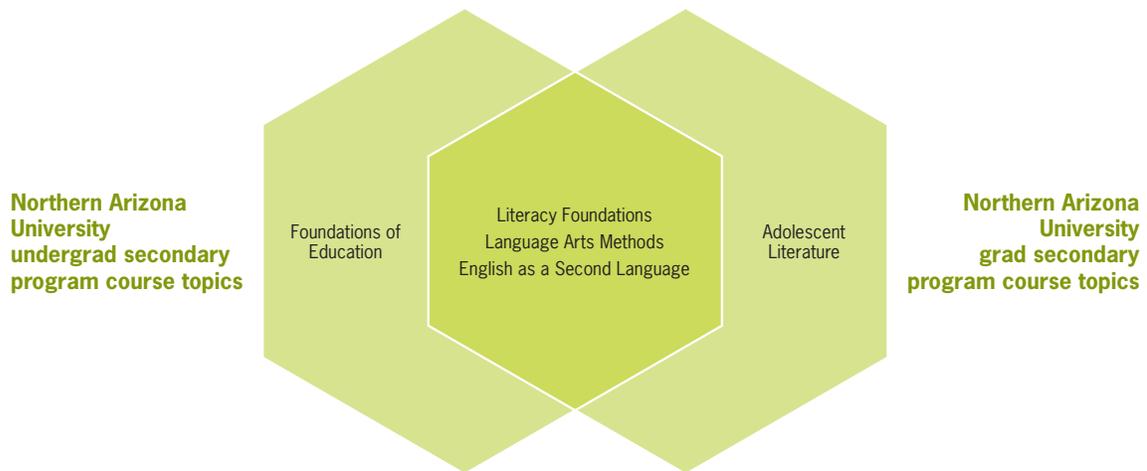
*Montclair State University's undergraduate secondary program requires 35 credits; the graduate program requires 37 credits, 5 percent more. The two programs address the same topics.*

The largely similar approaches taken by two programs on the same campus to preparing secondary candidates



*New York University's undergraduate secondary program requires 41 credits; the graduate program requires 45 credits, 9 percent more. Courses in the undergraduate program address two topics not addressed in graduate program coursework; a course in the graduate program addresses one topic not addressed in undergraduate program coursework.*

The largely similar approaches taken by two programs on the same campus to preparing secondary candidates



*Northern Arizona University's graduate secondary program requires 33 credits; the undergraduate program requires 42 credits, 27 percent more. A course in the undergraduate program addresses one topic not addressed in graduate program coursework; a course in the graduate program addresses one topic not addressed in undergraduate program coursework.*

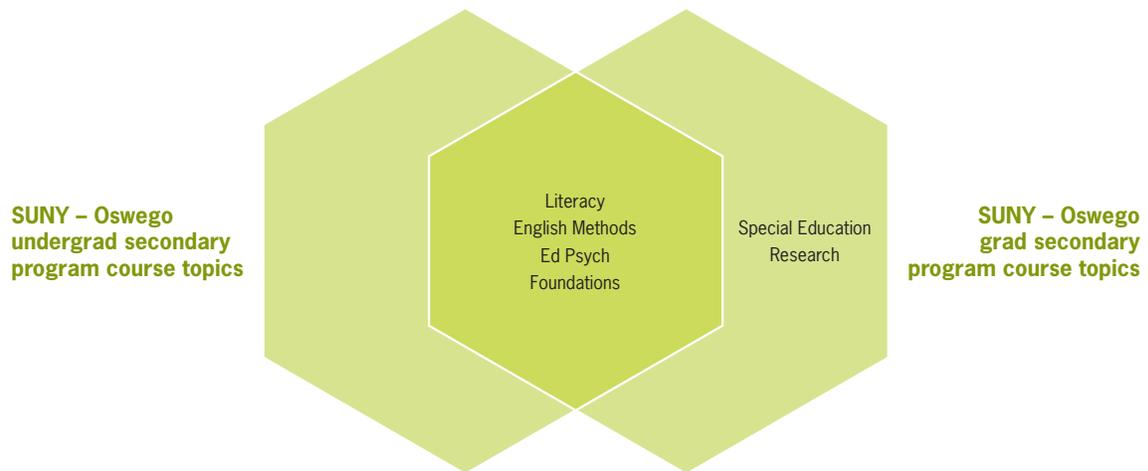
The largely similar approaches taken by two programs on the same campus to preparing secondary candidates



*SUNY College at Cortland's graduate secondary program requires 40 credits; the undergraduate program requires 43 credits, 8 percent more. Courses in the graduate program address three topics not addressed in undergraduate program coursework.*



The largely similar approaches taken by two programs on the same campus to preparing secondary candidates



*SUNY – Oswego's graduate secondary program requires 40 credits; the undergraduate program requires 41 credits, 2 percent more. Courses in the graduate program address two topics not addressed in undergraduate program coursework.*

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