Math Education Certification

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Introduction

The history of the education certification for teachers has a long history at Hood College. Training new teachers of a variety of content areas has been a major part of the Hood tradition throughout the past century, during which time the criteria for teaching certification has gone through many changes, including for the certification for teaching of mathematics in secondary schools.

The training of educators is a big part of Hood College today. Twelve and a half percent of undergraduate students at Hood College are enrolled in at least one of their education programs, earning a B.A. in early childhood education, a B.A. and duel certification in elementary and special education, or certification in secondary education[1]. Fifty percent of graduate students

are earning master's degrees in an education program. In total, a quarter of all Hood students are involved in a Hood College education program.

In general, to qualify for most professional teaching, administrative, and other public school positions, an individual is required to earn a certificate or license[2]. A certificate does not guarantee employment, but rather grants eligibility for employment to its holder.

Requirements

Certification requirements for prospective teachers vary by state. These requirements may include a college degree with minimum credit hours in a particular field of study, evidence of job experience, good moral character, U.S. citizenship, signing of a loyalty oath, and a minimum score on a basic skills test[2]. A certification granted by the state of Maryland is one of the most respected in the United States; a certification from Maryland qualifies the program completer to teach in 47 other states as well, though other conditions may apply[3].

The Education Department and the education certification for mathematics has evolved throughout the years. Hood College's first education program

began in 1909. According to the Hood College course catalogue collection, certification required 18 credits and 6 credits worth of practice teaching in 1924. In 1957, the secondary program required 19 semester hours in professional courses and a degree in an academic field. And today, 34 education credits are required (including 12 credits of teaching), in addition to a degree in the appropriate content field for certification.[4]

Change in the education programs happen sporadically. Sometimes there would be decades without changes to the curriculum, only to suddenly have a major shift in required classes or number of credits. Most changes are subtle, however, and may not even last for more than a couple of years. For instance, in 1925, *Modern Language* was removed as one of the supported certification subjects, but *Spanish* and *History* were added[4]. A couple years later, *Modern Language* made a return. A constant in the curricula is that they are always growing by adding more options and becoming more specialized. In 1924, Hood College's certification program included the classes *History of Education*, *Methods of Teaching in the High School*, *Principles of Secondary Education*, *School Management and Administration*, *Observation and Practice Teaching*, and *Methods of Teaching High School* in one of the subjects supported by the certification program.

Student teaching has always been a part of the certification, although it has never been as emphasized as it is now. Dr. Powell, Visiting Assistant Professor of the Education Department, and alumna of Hood College, recounts her experience as a student. In the mid-sixties, education students were only required to intern in a public school for half a semester, or eight weeks. Today, education students intern at a public school in all three years of the program, including a fulltime teaching position during the last semester. State requirements have students document at least one hundred hours of classroom experience to ensure that new teachers are well prepared for what awaits them in their career.

Prior to 1973, the only content specific course in the education department required for mathematics education was *Teaching of Mathematics in the Secondary School*, whose modern day equivalent is *EDUC 411 Educational Methods in Mathematics*[4]. In 1973, *Modern Geometry*, *Probability*, and *Differential Equations* courses were required to qualify for the education certification. These courses remain a requirement for education students to this day.

Only within the last ten to twenty years has education programs been rigorously structured. Every future educator at Hood College is required

to create an exit portfolio of his or her work during the program in order to receive their certification[4]. Ten years ago, the portfolio was not part of the curriculum, but rather done for the sole purpose of showing possible employers[6].

The Praxis exams, standardized tests required for teachers to pass in order to continue the program, are also a new requirement of teachers[4]. As of the mid-nineteen-nineties, student educators have been taking several Praxis exams [6]. The first is the Praxis I, which qualifies students to enter Phase I of the program, although an equivalent Scholastic Aptitude Test (SAT) also satisfy the requirement for this test. Then there are multiple Praxis II tests specific to the candidate's content area: all secondary education students take a Praxis II test for secondary education, and mathematics education students take the Praxis II for mathematics. Until this past year, the dual certification in elementary and special education required two separate Praxis II tests, but they have since been merged into one larger test[1]. This goes to show how education programs continually fluctuate and the flowing nature of education.

Hood used to do little to provide for its prospective teachers. For instance, Dr. Powell explained that during her student teaching, she was given no

instruction for how to plan a lesson, whereas now, every education course at Hood College includes strategies and methods of lesson planning. Also, the public schools that students were assigned to for their student teaching were not necessarily close, and, because students receiving financial aid were not permitted to park at Hood at the time, students had to find creative ways to get to their professional development school (PDS) to fulfill their teaching hours. For instance, Dr. Powell was able to get a ride to her PDS placement by carpooling with one of the teachers at her school. Also, since the Hood semester ended before the public school semester, and the education students had to continue their internship anyway, the education students had to find their own temporary housing until the public school semester was over. Thankfully, Hood College does a lot more to help its students today, such as assign PDS placements that students without reliable transportation can take public transportation to. The additional classroom experience requirements, credits, tests and projects all suggest that the education certification program has been becoming gradually more robust over the years.

Programs

In 1929, Hood College established its early childhood education program[1]. The *Onica Prall Child Development Laboratory School* was established at Hood College the same year, a facility for the advancement of early childhood education, one of fewer than seventy of its kind still operating in the country[1]. In the same year that the early childhood education program started, the Hood College art education program was abandoned. However, in 2008, due to popular demand, College President Ronald Volpe restored the art education program.

In 1973, the Special Education program started at hood[4]. However, in 2004, Special Education was abandoned as a program and a dual elementary/special education program was adopted[1]. There are many important factors that are considered when Hood creates or abandons a program. Programs like these take about two years to develop and approve. Once a program is drafted, it needs to gain approval from the local community and faculty before it gets sent to the Maryland State Department of Education (MSDE) in Baltimore. Once approved by the MSDE, the program is sent to the Maryland Higher Education Commission (MHEC) in Annapolis, who has the final say as to whether a college program gets accepted or not.

The criteria for whether a program is accepted or not by the MSDE and the MHEC is determined by various national teacher councils. For instance, the acceptability of a new mathematic program would be based on the standards set by the National Council of Teachers of Mathematics (NCTM)[5]. The NCTM was established in 1920 to ensure quality mathematics teaching and learning and have been issuing standards that reflect their vision of mathematics education since 1989.

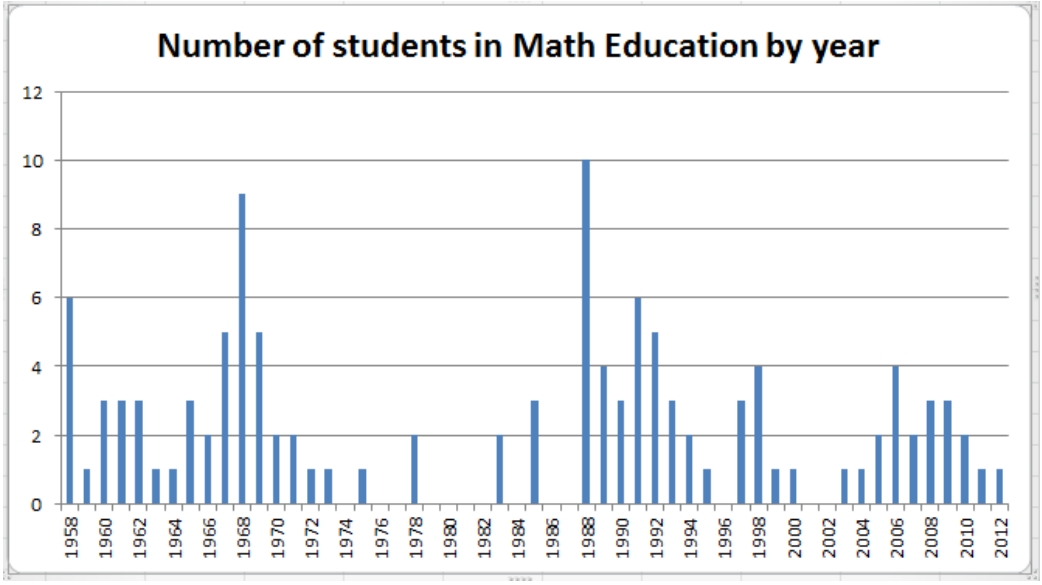
The Hood College Mathematics Department has always had a number of programs designed for those already in teaching positions. As far back as 1924, Hood College has offered post-baccalaureate professional development courses to local teachers in the same subjects as students within the certification program[4]. These courses include *History of Education*; *Methods of Teaching in the High School*; *Principles of Secondary Education*; *School Management and Administration*; *Observation and Practice Teaching*; and *Methods of Teaching High School* in one of the subjects supported by the certification program: English, Home Economics, Mathematics, Modern Languages, Biological Sciences, Latin, or French.

Hood still offers post-baccalaureate programs for high school and middle school teachers. Upon completing the 15-credit professional develop-

ment program, the teacher receives a certificate in secondary mathematics education[4]. Teachers in this program take *Discrete Mathematics*, as well as any pair of *Explorations in* and *The Teaching of: Geometry*, *Algebra*, or *Probability*. The program is often overlooked, however, because the state of Maryland mandates that teachers earn a master's degree or equivalent Advanced Professional Certificate [11].

Participation and Grants

The following is a chart illustrating the number of Hood students who were enrolled in the course *Teaching Mathematics in Secondary Schools* from 1958 to 2012 [7].



However, *Teaching of Mathematics in Secondary Schools* has been a course offered as far back as 1924[4]. This data is based on information stored by the Hood College registrar. It was a challenge to gather these data for a couple of reasons. First, the teaching certification program is not a major or minor, therefore there is nowhere that explicitly says who was earning certification as a mathematics teacher. Also, the registrar could not search by program completer because that information did not appear on transcripts until after 1973[7]. The solution to these problems was to find all graduating students enrolled in the course *Teaching Mathematics in Secondary Schools*. Unfortunately, these data only extended back to 1958, despite the fact that *Teaching Mathematics in Secondary Schools* had been offered for many years

before then[4].

The data show that there was a relatively good number of mathematics students in the certification program from the late fifties to the early seventies, with an average of more than 3 students in *Teaching Mathematics in Secondary Schools* from 1958 to 1972. This could be due in part by a push by the federal government to improve mathematics and science education, as evidenced by the *Dwight D. Eisenhower Mathematics and Science Education State Grant Program*[8]. This grant program is intended for the training and retraining of mathematics and science teachers, and the recruitment of minority teachers.

The following chart shows the amount of dollars that were distributed to science and mathematics educations by the Eisenhower grant from the years 1984 to 1994[8]:

Fiscal Year	Appropriation
1984	$0
1985	90,100,000
1986	39,182,000
1987	72,800,000
1988	108,904,000
1989	128,440,000
1990	126,837,000
1991	202,011,000
1992	240,000,000
1993	246,016,000
1994	250,998,000

As it can be seen, there is a general trend toward more funding for mathematics and science.

A similar push for math and science education is happening now with *Science, Technology, Engineering, and Mathematics (STEM)* programs. The *Science, Mathematics and Research for Transformation (SMART) Scholarship*[9], the *National Science and Mathematics Access to Retain Talent Grant (SMART)*[10], and the *Academic Competitiveness Grant Program (ACG)*[10] are all given by to undergraduate students pursuing STEM disciplines. The *Science, Mathematics and Research for Transformation (SMART) Scholarship* in particular is funded by the department of defense and includes a

minimum cash award of 25,000 dollars plus full tuition and fees per year for up to five years, and a paid summer internship.

There was a drought of mathematics education students from 1972 to 1987, which only had an average of 2/3 students per year. The drought ended with the class with the most graduating mathematics educators in 55 years: ten in 1988. Since then, there have been dips and spikes in the number of participants, but seems to have leveled out at an average of 2 students per year in the last ten years.

Conclusions

Tradition is important at Hood College. The Education Department has some of the most tried and true programs in Maryland, and they are still improving them to become better in order to bring the students the most effective and applicable experience that they can have. Students who earn their secondary teaching certification from Hood College are prepared for the real world work environment and are destined to be successful teachers.

References

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[2] Webb, L.D., Metha, A., and Jordan, K.F. (2009) *Foundations of American Education*. Page 306. Pearson.

[3] *State-by-State Chart for Policies on Reciprocity and Out-of-State Teacher Certification*. Swarthmore College. April 17, 2013, from http://www.swarthmore.edu/Documents/State

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