

**Transitions Math Project Placement Survey**  
**Whatcom Community College**  
**Fall 2005**

During the fourth and fifth weeks of the fall quarter, 2005, a survey was conducted in each of Whatcom Community College's Beginning and Intermediate Algebra courses. The survey was funded by the TMP and produced through discussions with the Vice President for Instruction and the Math Faculty at WCC.

As seems to be the case at many 2-year institutions statewide, enrollments in our pre-college level courses have been steadily increasing even as our overall college enrollment has decreased over the past few years. Many theories exist for this phenomenon, but we wanted to obtain some real data in an effort to answer some of the following questions:

1. How long was the gap between the student's last class taken and the first WCC class?
2. What was the student's highest level course taken in high school?
3. Are students placing in the course they expect to?
4. Why are students not taking math for 4 years in high school?
5. What are some of the primary reasons students like/dislike math courses?
6. Do we actually have a significant number of running-start students taking (and paying for) pre-college level math and why?
7. How much college level mathematics do students plan on taking?

Other questions were also addressed in an effort to better communicate with the high schools and gain feedback for us as a department. A copy of the entire survey with suggestions for improvements will be available on the Transition Math Project website.

Since our survey was designed specifically for Whatcom Community College students, we referred to our courses with our course numbering system. For the remainder of the report, many of the courses will be referred to by our course numbering at WCC:

Math 92 = Arithmetic of Fractions and Decimals

Math 94 = Basic Mathematics

Math 97 = Beginning Algebra I

Math 98 = Beginning Algebra II

Math 99 = Intermediate Algebra

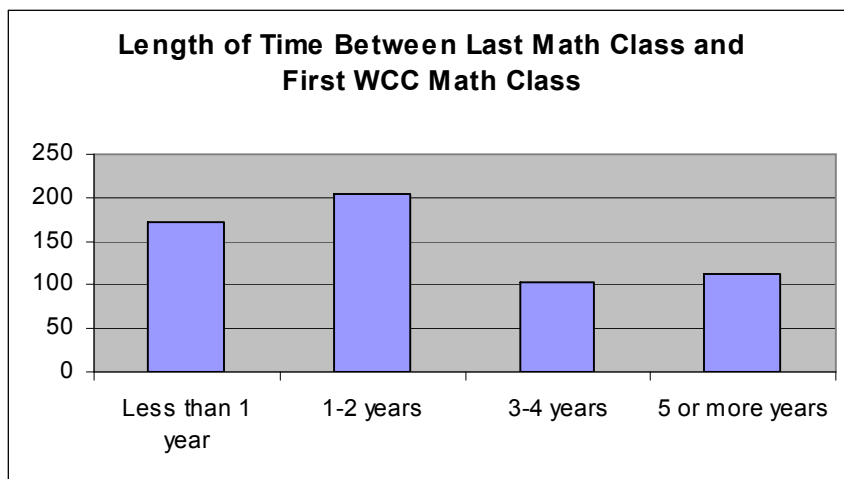
**Survey methods**

Only students in Math 97, 98 and 99 were surveyed. Surveys were administered to all instructors of these courses fall quarter, 2005. Each of our classes were surveyed, with the majority of these teachers asking students to fill out the surveys in class. In the end, each of our classes were surveyed, and the total response rate was 597 students out of a 10<sup>th</sup> day enrollment figure of 851 total students. Throughout the report, the term *students* will refer to students participating in this survey, meaning students who are currently taking a pre-college algebra course at WCC.

## Questions and Results

### Question 1: How long was the gap between a student's last math class and the first math class taken at WCC?

For this question, we are interested in analyzing not only the length of time between the last math class taken and the first Whatcom Community College math course, but also the placement expectation that can be associated with this gap. It would seem reasonable to expect that with a relatively young student body population, we would have many students who have taken a math class in the past two years before entering WCC, and also that the longer a student is away from mathematics courses, the lower the level of placement to be expected. The data below seems to bear out these hypotheses.



All of these figures, unless otherwise noted, are for students currently enrolled in Pre-College Algebra courses at WCC. The chart above is showing that out of these students, a strong majority have taken a math course in the past 2 years before beginning their first course at WCC.

		Gap Between Last Math Class and First WCC Math Class				
Initial Placement		Less than 1 year	1-2 years	3-4 years	5 or more years	Row Summary
	Math 92	7 4.14%	7 3.45%	7 6.86%	15 13.64%	36 6.14%
	94	10 5.92%	12 5.91%	12 11.76%	26 23.63%	60 10.24%
	97	76 44.97%	110 54.19%	52 50.98%	51 46.37%	291 49.66%
	98	69 40.82%	69 33.99%	26 25.49%	13 11.82%	177 30.20%
	99	7 4.14%	5 2.46%	5 4.90%	5 4.55%	22 3.75%
	Column Summary	169 100%	203 100%	102 100%	110 100%	586 100%

From the table above, we can see that the majority of our current pre-college algebra students are placing into Math 97 (Beginning Algebra I). 70% of students placing into these classes have a gap of at least one year between their last math class and their initial math course at WCC. 36% have a gap of 3 years or more. The numbers support the expected result here—that the students who have an extended break between math classes are placing into lower level math courses.

As a follow up years from now, it might be worth examining if the gap of time between the math courses taken is increasing or decreasing, and how the proportion of students placing in basic mathematics courses changes in comparison.

**Question 2: What was the highest level course taken in high school?**

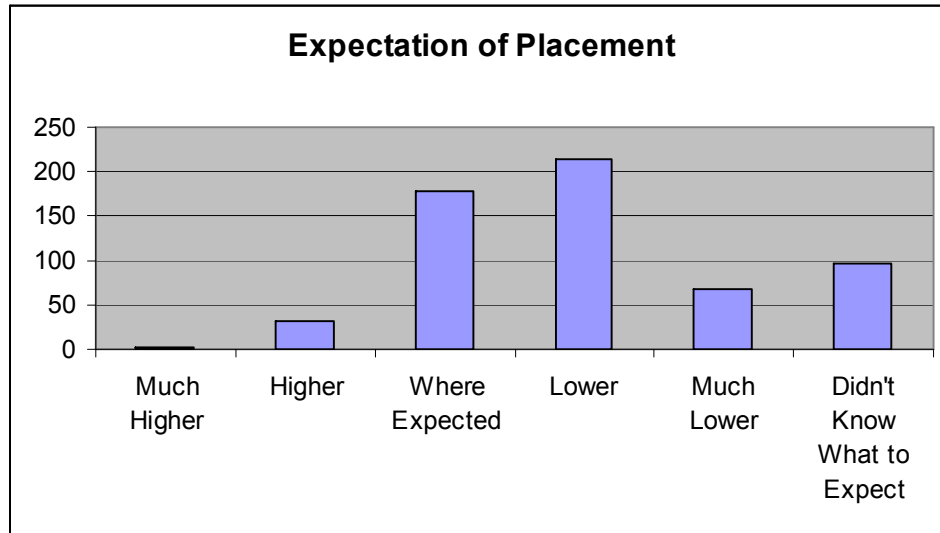
This question is somewhat problematic to arrange due to naming and curriculum irregularities. Many schools teach Algebra I, while others teach Integrated I, which is often called Integrated Algebra I. Some schools number their courses by semester, while others number by year. Furthermore, in discussions with high school students, it appears that many students are not referring to their own courses in a consistent manner. Locally, in Bellingham, Algebra I would be most closely equivalent to Integrated Algebra I. Geometry would be most closely associated with Integrated II or Integrated Geometry, and Algebra II would be closely associated with Integrated III or Integrated Algebra II. The table below lists the highest class taken by these students in their high school curriculum.

	<b>Frequency</b>	<b>Percentage</b>
<b>Algebra I</b>	92	15.65%
<b>Geometry</b>	71	12.07%
<b>Algebra II</b>	194	32.99%
<b>Precalculus</b>	81	13.78%
<b>Integrated I</b>	8	1.36%
<b>Integrated II</b>	29	4.93%
<b>Integrated III</b>	59	10.03%
<b>Other</b>	54	9.18%
<b>Total</b>	588	100%

If we treat Integrated III and Algebra II as the high school equivalent of Intermediate Algebra, then it appears that more than half of the students in our Pre-College Algebra courses have already been exposed to the material to be studied in Intermediate Algebra. As a note, “Other” responses varied widely, but the most common responses were a college prep Trig/Stats course or Statistics. When you consider that out of our surveyed students, only 3.75% placed into Intermediate Algebra, the amount of repetition is even more extreme. It is worth noting, though, that 77% of these students did not take a math course past 2<sup>nd</sup> year algebra (or Integrated III) in high school. Out of this group that did not continue beyond 2<sup>nd</sup> year algebra, 72% placed into Beginning Algebra I or lower.

### Question 3: Are students placing where they expect to?

For this question, we anticipated that a majority of students would feel as if they had placed lower than expected. This hypothesis was validated by the following results.



It seems reasonable to expect that at least three major factors would affect a student's expectations with respect to placement:

- The highest class taken in high school
- The length of time between classes
- The college level course.

Out of students who took Algebra II, third year Integrated, or a higher course in high school, 64% of students who had an expectation of placement\* placed lower than expected. Out of students who did not reach this level in high school, 45% of those with an expectation of placement placed lower than expected.

Out of students who with a gap of 2 or fewer years between math courses, 64% of those who had an expectation of the placement test placed lower than expected. Out of students with a gap of 3 or more years between math courses, 45% of those who had an expectation of the placement test placed lower than expected. These results are strikingly similar to the numbers above describing placement expectation and the highest level high school course taken. A large part of that is clearly due to the strong overlap between the groups. 85% of students who took 4 years of math in high school reached the level of Algebra II or higher.

Interestingly enough, the class that a student placed into did not seem to have a large effect on student's perception of being misplaced. Out of students placing into basic math courses, 53% of those who had an expectation of placement placed lower than

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\* This does not include the students who answered that they did not know what to expect for placement.

expected. Out of students placing into Math 97 (Beginning Algebra I), 57% of those with an expectation of placement placed lower than expected. For Math 98, this figure was 59% and for Math 99, this figure was 57%.

#### **Question 4: Why are students not taking 4 years of math in High School?**

As established by the prior questions, a majority of pre-college algebra students have had a gap in their mathematics and have not reached high levels of mathematics in high school. An obvious reason for both of these problems is that many students are not taking four years of math in high school. Out of the students in these pre-college algebra courses, 76% did not take 4 years of math in high school. Out of those who did take four years in high school, 85% reached second year algebra, meaning 15% of these students did need four years of high school mathematics to reach Algebra I or Geometry.

For this question, students who did not take four years of high school mathematics were asked reasons for this. Students could select all that applied.

##### **Option 1: Took enough to graduate and stopped**

Out of those respondents who did not take four years of math, this was chosen 53% of the time.

##### **Option 2: Disliked Math**

Out of respondents who did not take four years of math, this option was chosen 39% of the time.

##### **Option 3: Not advised to take four years of math**

Out of respondents who did not take four years of math, this option was chosen 11% of the time.

##### **Option 4: Other**

Out of respondents who did not take four years of math, this option was chosen 22% of the time.

There were three responses that were most commonly listed by those selecting “other.”

1. Did not fit into schedule. Needed other courses for graduation requirements.
2. Running start student (either currently or in the past).
3. High school dropout.

Clearly, with such a large percentage selecting “other,” and a significant percentage not answering the question at all, this was a question that needed some other choices. After discussions at Transitions Math Project meetings, there are two recurring themes that make sense to include in future surveys.

- Many students do not necessarily see themselves as college material during their high school years.
- For many, there is likely an assumption that meeting high school requirements is equivalent to college readiness.

In addition to these factors, it may have been beneficial to find out the number of students that took more math than needed for high school requirements, whether that means 2 years or 3 years.

### **Question 5: Why do these students like/dislike math?**

At this point, we examined the reasons students both like and dislike math. The objective was to look for or confirm ideas for effective teaching and advising regarding math classes at the high school and college level. 39% of students listed disliking math as a factor in their decision not to take 4 years of math in high school, and unfortunately, this choice is often times setting them back for a year or more college.

In constructing the survey, we listed several options for reasons that a student has enjoyed math as well as reasons that a student has disliked math.

The table below lists the options for students who stated they disliked math to select as a reason. Once again, students could select as many choices as they liked. The list below gives the choice with the corresponding percentage of students who selected that option.

- Difficult – 38%
- Move too fast through material – 34%
- A specific teacher or teachers – 30%
- Too much material to keep straight – 27%
- Do not see the uses for the subject – 22%
- Curriculum – 15%
- Too much homework – 14%
- Other – 13%
- Hard to read – 9%
- Being good at math was not though highly of at my school(s) – 2%
- Pressure from parent(s) – 1%
- Pressure related to brother(s), sister(s) – 1%

In the “other” option, the two most added responses were “lazy” and “boring.”

We also then asked all students (not just those who answered they disliked math) for a reason they liked math or had a good experience with math. As before, students could select an unlimited number of choices for their responses. The percentage of students responding yes to the choices are listed below.

- Good teacher – 62%
- Challenging, but satisfying – 32%
- Comes easy for you – 18%
- Useful or applicable subject – 13%
- Other – 7%
- Exciting problem or application – 4%

In the “other” option, the most common added response was “None. I never like math”

**Question 6: Do we have a sizeable number of Running Start students taking, and paying for, pre-college level math courses?**

To begin with, we wanted to find out the number of Running Start students taking, and paying for, pre-college level math courses.

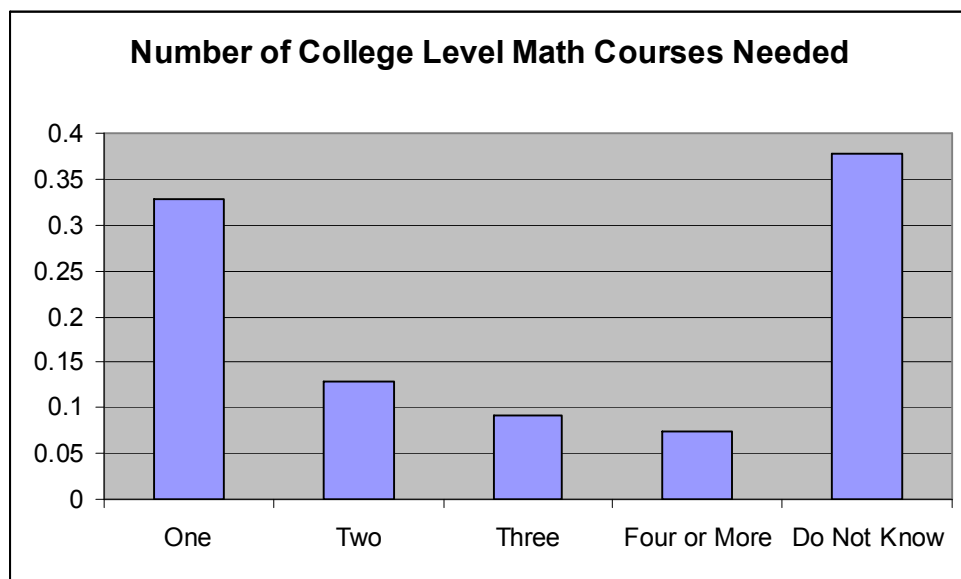
Out of our surveyed students, 9% are either currently running start or were running start and took pre-college math courses as a running start student. Since these Running Start students have to pay for pre-college level courses at the college level, we were interested in knowing the reasons a student would opt to pay for a class they could take for free at their local high school. While there was not a lot of data to work from since it is a relatively small percentage of the overall pre-college math students, we did obtain the following results. Once again, students could select more than one choice.

The percentage of students who took pre-college level math courses as Running Start students who answered yes to the following reasons are listed belows. These percentages are out of a total of 51 students responding to this question.

- For the instruction – 19%
- For the content – 16%
- Full-time Running Start – 55%
- To complete the course in less time – 24%
- Other – 29%

**Question 7: How much college level mathematics do these students plan on taking?**

Finally, we wanted to know the number of college level math courses that students currently plan on taking for their major degrees or other purposes.



It is understandable that there is a significant portion of students (37%) who do not know the amount of college level math courses they will need at this stage of their education. Another 33% of students believe they will only need their one college level math course

to meet requirements. It is worth noting, however, that this leaves 30% of students who are already planning on taking at least two college level math courses, in addition to the number of students in the unknown category who will eventually decide on majors or plans requiring additional math.

## **Conclusion**

Most of the results of this relatively comprehensive study of pre-college level math students at Whatcom Community College support beliefs held by many instructors both locally and statewide. Many of these students have had poor math experiences in the past, chose not to take four years of math in high school, and have not previously reached high levels in mathematics. These results were not surprising to many. It is worth noting, however, that there are a sizeable number of these students who are not simply looking to pass their basic math classes and graduate with a non-mathematically based degree. Many students stated they enjoyed the challenge of mathematics, are looking to take multiple college level courses, and are enjoying their experience in math courses at WCC. Unfortunately, a large number of students are slowing their time table to a degree in college and potentially hindering their success in other courses by not taking more math in high school or adequately preparing for placement testing.

For those wishing to receive more detailed data from the survey or with additional questions, feel free to contact Ed Harri at [eharri@whatcom.ctc.edu](mailto:eharri@whatcom.ctc.edu). In addition to this report, there is a copy of the survey available online at the TMP website. The survey is presented as it was presented to our students, but there are a few comments on the survey regarding questions that we would change as a result in retrospect.