Developmental Mathematics

Weber State University
Five-Year Program Review
Self-Study

Department/Program: Developmental Mathematics

Semester Submitted: Fall 2013

Self-Study Team Chair: Kathryn Van Wagoner

Self-Study Team Members: Loyal Baker, Cristine Lewis, Hollie Orton

Contact Information:
Phone: (801) 626 - 7585
Email: kathrynvanwagoner@weber.edu

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A. Brief Introductory Statement

Developmental Mathematics is a sequence of pre-college level math courses designed to prepare students for college level mathematics. The Developmental Mathematics Program at Weber State University offers Pre-algebra (Math 0950), a First Course in Algebra (Math 0990) and Intermediate Algebra (Math 1010). Pathway to Contemporary Math (Math 0810 or 0970) will be piloted Spring 2014 semester. Consistent with national norms, approximately 2/3 of students entering this open enrollment institution need Developmental Mathematics courses for a variety of reasons. It is the goal of the Developmental Mathematics Program to assist students in gaining the math skills they need for success in college level mathematics in as short a time as possible. Weber State University is a leader in the state when it comes to Developmental Mathematics innovation. Technology Enhanced Redesign of Mathematics (TERM) was implemented fully Spring 2010, flipped courses were introduced in Fall 2012 and a pathways course was piloted Spring 2014.

B. Mission Statement

The Developmental Mathematics Program of Weber State University opens doors of opportunity by preparing students for success in college level mathematics courses. The program seeks to build confidence, promote learning skills, develop problem-solving skills, and teach Developmental Mathematics concepts in a learner-centered environment.

C. Curriculum

Curriculum Map

Core Courses in Department/Program	Department/Program Learning Outcomes							
	Learning Outcome 1	Learning Outcome 2	Learning Outcome 3					
Pre-algebra	A	A	P					
First Course in Algebra	A	A	P					
Intermediate Algebra	A	A	P					
P = assessed post-completion of our program								
A = Assessed post-course								

Note[a]: Define words, letters or symbols used and their interpretation; i.e. 1= introduced, 2 = emphasized, 3 = mastered or I = Introduced, E = Emphasized, U = Utilized, A = Assessed Comprehensively; these are examples, departmental choice of letters/numbers may differ
Note[b]: Rows and columns may be transposed as required to meet the needs of each individual department

Summary Information (as needed)

D. Student Learning Outcomes and Assessment

Measureable Learning Outcomes

Learning Outcome 1: 50% of our students complete their courses at 70% or better.
Since the implementation of the TERM method of course delivery, pass rates have declined in all courses. Changes were made to the program beginning Summer 2012 to improve pass rates. As there has been no formal assessment plan prior to the 2012 – 2013 academic year, 2011 – 2012 pass rates will provide baseline data for future assessment of this learning outcome. Data for this outcome will be collected from grade distributions accessed through Crystal Reports following each semester. Data will be collected from Math 0950, Math 0990 and Math 1010.

Learning Outcome 2: 50% of students who complete course evaluations will indicate they have improved their ability to learn by using resources, asking questions, and seeking answers
What distinguishes developmental education from remedial education is that developmental education seeks to holistically influence the development of the student, not just remediate deficiencies in course content. This learning outcome seeks to measure one very important aspect of the students' development, the ability to be an independent learner. Data for this outcome will be collected from student evaluations of the course conducted near the end of each semester. Data will be collected from Math 0950, Math 0990 and Math 1010.

Learning Outcome 3: Students completing Math 0950, Math 0990 and Math 1010; OR Math 0990 and Math 1010 at Weber State University will pass quantitative literacy mathematics at a rate equal to or better than students who placed directly into their quantitative literacy course (Math 1030, Math 1040, or Math 1050).
Part of the mission of the Developmental Mathematics Program is to prepare students for college level mathematics. The purpose of this learning outcome is to assess how well our students perform in their first college level math course. Data for this outcome will come from institutional research and be collected at the end of each academic year. Data will be collected on completion of Math 1030, Math 1040 and Math 1050.

Evidence of Learning: Courses within the Major

Evidence of Learning: Courses within the Major					
Measurable Learning Outcome **Students will…**	**Method of Measurement** **Direct and Indirect Measures***	**Threshold for Evidence of Student Learning**	**Findings Linked to Learning Outcomes**	**Interpretation of Findings**	**Action Plan/Use of Results**
Learning Outcome 1: *50% of our students complete their courses at 70% or better*	Measure 1: Grade distributions are extracted from Banner through Crystal reports	Measure 1: All students with grade of C or better will complete the course at 70% mastery	Measure 1: See Appendix G for course pass rates	Measure 1: Pass rates are generally improving. Further improvement is needed.	Measure 1: Continuing to implement improvements made in TERM last year and exploring other course and delivery options.
Learning Outcome 2: *50% of students who complete course evaluations will indicate they have improved their ability to learn by using resources, asking questions, and seeking answers*	Measure 1: Data from Chitester, student evaluations.	Measure 1: 50% of students who complete course evaluations will indicate they have improved their ability to learn by using resources, asking questions, and seeking answers	Measure 1: In the 2012-13 academic year 57% of students completing course evaluations indicated they have improved their ability to learn by using resources, asking questions, and seeking answers	Measure 1: This provides baseline data for future evaluations. We should seek to increase this outcome, but it is a good start.	Measure 1: Poster campaign telling students to "Raise your hands" and "Don't jump ship. Ask for help." Incorporating more learning strategies into the curriculum. Plan to have learning strategies embedded in courses by Fall 2014.
Learning Outcome 3: *Students completing Math 0950, Math 0990 and Math 1010; OR Math 0990 and Math 1010 at Weber State University will pass*	Measure 1: Data extracted from Banner through Crystal reports	Measure 1: Students completing Math 0950, Math 0990 and Math 1010; OR Math 0990 and Math 1010 at Weber State University will pass	See Appendix G for pass rates	Dev math students outperform directly placed students in Math 1030, significantly underperform in Math 1040, and slightly	Further research is needed to identify the problems in the underperformance in Math 1040 and 1050. One thing to consider is the low N,

Evidence of Learning: Courses within the Major					
Measurable Learning Outcome **Students will…**	**Method of Measurement** **Direct and Indirect Measures***	**Threshold for Evidence of Student Learning**	**Findings Linked to Learning Outcomes**	**Interpretation of Findings**	**Action Plan/Use of Results**
quantitative literacy mathematics at a rate equal to or better than students who placed directly into their quantitative literacy course (Math 1030, Math 1040, or Math 1050)		quantitative literacy mathematics at a rate equal to or better than students who placed directly into their quantitative literacy course (Math 1030, Math 1040, or Math 1050)		underperform in Math 1050.	particularly in Math1040 data. 1030 and 1040 outcomes raise the question of preparation. Is the dev math algebra track the wrong preparation for 1040, and/or too much preparation for 1030?

*At least one measure per objective must be a direct measure. Indirect measures may be used to supplement evidence provided via the direct measures.

Summary Information (as needed)

We recognize that these are departmental outcomes, not student learning outcomes (especially #1 and #3). In a strategic planning meeting to be held at the end of this semester the faculty will identify student learning outcomes and an assessment plan.

E. Academic Advising

Role of Advisor/Learning Strategist

Developmental Mathematics has one employee in the position of advisor and learning strategist whose role is to:

- Provide accurate information about the program to new, continuing and prospective students in person, via email or over the phone
- Counsel students in implementing learning strategies.
- Suggest appropriate course to be taken.
- Assist students with enrollment and registration.
- Bridge the gap between instructors and students.
- Meet frequently with struggling students to help them understand expectations and requirements to succeed in math as well as understand the content.

Advising Strategy and Process

The goal of advising is to provide students with accurate information, assist them in making appropriate choices to help them reach their educational goals. Additionally, our advisor acts as a learning strategist to coach students in developing better academic skills. Depending on the need of the student, the advisor may assess the student's academic and math background, learning skills, awareness and use of available resources, and use of time. Based on this assessment, the advisor will provide a recommendation that meets the individual needs of the student.

Effectiveness of Advising

The advisor does not have a formal assessment process in place to measure the effectiveness of advising. Having an advisor in place has generally improved the effectiveness of the department by removing the load of advising from the administrative assistant, allowing her to focus on departmental needs. It is also beneficial having a qualified individual dedicated solely to advising students and assisting them in their learning needs. The climate of student satisfaction has improved due to providing better service to our students.

Past Changes and Future Recommendations

Past Changes:
This position is new as of August 2012. Prior to this time the department administrative assistant advised students and managed registration needs. Creation of an advisor and learning strategist position has strengthened the department's ability to serve student needs. The following activities are a result of creating this position.

- Learning strategies are discussed in meetings with students.
- An advising web page has been created with essential information for students.
- Interventions are made with struggling students through intentional advising.
- The advisor is available on the Davis campus one afternoon per week.
- Students can meet with the advisor in the absence of an instructor to get additional attempts on quizzes and/or tests

Future Recommendations:

- Inventory/survey students' level of satisfaction after meeting with the advisor.
- Create a tracking/log in system to quantify number and type of advising session.
- Increase collaboration with student support programs across campus.

F. Faculty

Faculty Demographic Information
See Appendix B

Programmatic/Departmental Teaching Standards
From Spring 2010 through Summer 2012, the expectation of faculty was to spend class time personally visiting with each student to track progress and answer math questions one-to-one. In the 2012-13 academic year, faculty were encouraged to find ways to build community in their classrooms by encouraging group interaction through engaged learning activities. Faculty have been working together to develop appropriate learning activities to supplement the curriculum in Pearson's MyMathLab. Faculty were provided a rubric in Fall 2013 of teaching standards to work toward achieving. The rubric was

used by the program director in class observations and to facilitate a conversation with each instructor about how to improve teaching. See appendix H for the rubric.

Faculty Qualifications

Hiring qualifications:
Full time: Bachelor's degree in Mathematics, Mathematics Education, or equivalent plus two years teaching Developmental Mathematics or equivalent. Preference is given to Master's degrees.
Adjunct: A bachelor's degree in mathematics or related field

Evidence of Effective Instruction

Regular and Adjunct Faculty are evaluated through student evaluations.

Mentoring Activities

No formal mentoring process is in place. The program director conducted informal observations of 71% of the instructors during Fall 2013 and will observe the remaining instructors in Spring 2014. Observations were followed with a reflection interview with each instructor where suggestions for improvement were discussed. See Appendix H for the Class Observation Rubric.

Diversity of Faculty

All faculty are Caucasian.
Full time faculty - 31% male and 69% female.
Adjunct faculty - 20% male and 80% female.
Staff - 2 Caucasian females and one African American male.

Ongoing Review and Professional Development

Every full time instructor completes an annual review at the end of spring semester. Each full time instructor completes a more in depth review every three years. No formal review process exists for adjuncts.

Professional development is informally conducted in bi-weekly department meetings for full time faculty. Adjunct participate in at least one departmental professional development retreat per year. The university provides optional professional development retreats for adjunct faculty each semester. Faculty have the opportunity to attend regional and national conferences.

G. Support Staff, Administration, Facilities, Equipment, and Library

Adequacy of Staff
1 – Program director
1 – Administrative Assistant
1 – Advisor & Learning Strategist
1- Student hourly employee

IT support staff are provided through (and shared with) the College of Science and WSU Online. Ideally, we could use one full-time network/hardware specialist and one full-time system/software specialist.

The learning strategist position was added Fall 2012. Prior to that time the administrative assistant handled student advisement. Having a full-time dedicated advisor has greatly improved department quality and efficiency.

Ongoing Staff Development
Staff are encouraged to participate in training and development offered regularly by the university human resources department

Adequacy of Administrative Support
The program has one administrative assistant, which is adequate at this time

Adequacy of Facilities and Equipment
When the program implemented the TERM program, three classrooms were converted to computer lab classrooms for exclusive use by the program – two in Building 4 and one in the Electronics Technology building. Additionally, an emporium lab (the Hub) was created in Lampros Hall. These facilities were quite adequate until Fall 2012, when the

program began offering flipped classes. The program strategic plan includes offering more sections of flipped and pathways classes, as well as increase the class meetings of TERM classes from one day a week to two days a week, which requires the use of much more classroom space. This need will be exacerbated when Buildings 3 and 4 are razed for the construction of the new science building. The amount of classroom space in the new building for Developmental Mathematics is uncertain at this time.

Adequacy of Library Resources
Library resources are not needed for Developmental Mathematics courses.

H. Relationships with External Communities

Description of Role in External Communities
The Developmental Mathematics Program is foundational to all majors on campus and takes this role seriously by working with all parts of the campus community to improve student success in our courses.

Instructor Debi McKee serves on the local K-16 alliance committee.

Summary of External Advisory Committee Minutes
Developmental Mathematics has an advisory committee that consists of the program director, the Developmental Mathematics course leads, and representatives from student support services and central advising. The dean of the College of Science and the Associate Provost participate on an as-needed basis.

Minutes of the advisory committee meetings are on file in the department. Advisory committee meetings discuss a range of information including coordinating logistics between Developmental Mathematics and student support services, reforming Developmental Mathematics courses, and improving math placement.

I. Action Plan for Ongoing Assessment Based on Current Self Study Findings

This is the first program review completed for Developmental Mathematics, so there is no previous action plan on which to report.

J. Summary of Artifact Collection Procedure

All course data is contain in the Pearson MyMathLab software.

APPENDICES

Appendix A: Student and Faculty Statistical Summary

Developmental Math	2008-09	2009-10	2010-11	2011-12	2012-13
Student Credit Hours Total [1]	**9,921**	**19,774**	**25,387**	**25,628**	**28,065**
Student FTE Total [2]	**330.70**	**659.13**	**846.23**	**854.27**	**935.50**
Student Majors [3]	n/a	n/a	n/a	n/a	n/a
Program Graduates [4]					
Associate Degree	n/a	n/a	n/a	n/a	n/a
Bachelor Degree	n/a	n/a	n/a	n/a	n/a
Student Demographic Profile [5]	n/a	n/a	n/a	n/a	n/a
Female					
Male					
Faculty FTE Total [6]	**5.37**	**6.78**	**9.5**	**10.23**	n/a
Adjunct FTE	1.58	2.99	5.32	**6.13**	n/a
Contract FTE	3.79	3.79	4.18	4.1	n/a
Student/Faculty Ratio [7]	**61.58**	**97.22**	**89.08**	**83.51**	n/a

Note: Data provided by Institutional Research
Summary Information (as needed)
Student Credit Hours Total represents the total department-related credit hours for all students per academic year. Includes only students reported in Banner system as registered for credit at the time of data downloads.
Student FTE Total is the Student Credit Hours Total divided by 30.
Student Majors is a snapshot taken from self-report data by students in their Banner profile as of the third week of the Fall term for the academic year.

Program Graduates includes only those students who completed all graduation requirements by end of Spring semester for the academic year of interest. Students who do not meet this requirement are included in the academic year in which all requirements are met. Summer is the first term in each academic year.
Student Demographic Profile is data retrieved from the Banner system.
Faculty FTE is the aggregate of contract and adjunct instructors during the fiscal year. Contract FTE includes instructional-related services done by "salaried" employees as part of their contractual commitments. Adjunct FTE includes instructional-related wages that are considered temporary or part-time basis. Adjunct wages include services provided at the Davis campus, along with on-line and Continuing Education courses.
Student/Faculty Ratio is the Student FTE Total divided by the Faculty FTE Total.

Appendix B: Contract/Adjunct Faculty Profile

Name	M/F	Ethnicity	Rank	Tenure Status	Highest Degree	Years of Teaching			
						Weber		Other	
						FT	Adj	FT	Adj
Acor, Brenda	F	Caucasian	Instructor	n/a	Masters	10.5	2	11	0
Allred, Alice	F	Caucasian	Instructor	n/a	Masters	13.5	11.5	0	.5
Baker, Loyal	M	Caucasian	Instructor	n/a	MS	11	7	0	16
Barney, Corine	F	Caucasian	Adjunct	n/a	Bachelor	0	14	24	0
Barrett, Catherine	F	Caucasian	Adjunct	n/a	BS	0	3	3	0
Bockholt, Allison	F	Caucasian	Adjunct	n/a	BS	0	1	0	0
Canales, Lauri	F	Caucasian	Adjunct	n/a	Masters	0	4	0	4
Floyd, Jeremy	M	Caucasian	Adjunct	n/a	Bachelors	0	6	11	0
Gabbitas, Allison	F	Caucasian	Adjunct	n/a	Bachelors	0	4.5	0	0
Hallin, Stephen	M	Caucasian	Adjunct	n/a	MS	2	4.5	0	8
Holt, Julie	F	Caucasian	Adjunct	n/a	MS	0	3	20	3
Hansen, Amber	F	Caucasian	Adjunct	n/a	BS	0	2	0	0
Hansen,	F	Caucasian	Instructor	n/a	MS	16	0	6	2

Mary Jo									
Harden, Elizabeth	F	Caucasian	Adjunct	n/a	MA	0	5	2	2
Hunt, Corrine	F	Caucasian	Adjunct	n/a	MS	0	11	0	0
Iacovelli, Jack	M	Caucasian	Adjunct	n/a	BS	0	11	30	0
Imig, David	M	Caucasian	Instructor	n/a	MS	10.5	0	4	2
Jones, Charity	F	Caucasian	Instructor	n/a	Masters	.5	6	4	3
Kent, Randall	M	Caucasian	Adjunct	n/a	MS	0	3	1	3
Lewis, Cristine	F	Caucasian	Instructor	n/a	MA	.5	12	0	1
Marriott, Katrina	F	Caucasian	Adjunct	n/a	Bachelors	0	4.5	4	0
McKee,Debi	F	Caucasian	Instructor	n/a	Masters	3.5	8	6	0
Poore, Darrell	M	Caucasian	Instructor	n/a	BS	12	0	0	0
Portz, Heidi	F	Caucasian	Adjunct	n/a	BS	0	3	15	0
Quesnell, Carrie	F	Caucasian	Instructor	n/a	Masters	10	3	0	1
Rich, Michelle	F	Caucasian	Adjunct	n/a	MBA	0	2.5	0	0
Schilling, Pam	F	Caucasian	Instructor	n/a	MS	5	0	8	0
Sjoblom, Meghann	F	Caucasian	Adjunct	n/a	Bachelors	0	1	11	0
Thaeler,	M	Caucasian	Associate	Tenure	PH.D.	32	0	10	4

John			Professor	d					
Thompson, Erin	F	Caucasian	Adjunct	n/a	BS	0	7	0	0
Webster, Lori Jo	F	Caucasian	Adjunct	n/a	BS	0	6	3	3
Wilhelmsen, Diana	F	Caucasian	Adjunct	n/a	MEd	0	5	19	0
Wilkinson, Janette	F	Caucasian	Instructor	n/a	BS	.5	5	0	4
Yonkee, Mary Ellen	F	Caucasian	Instructor	n/a	MS	3.5	13	6	1

Appendix C: Staff Profile

Name	Gender	Ethnicity	Job Title	Years of Employment			
				Weber		Other	
				FT	ADJ	FT	ADJ
Orton, Hollie	F	Caucasian	Admin Specialist	1	n/a	n/a	n/a
Van Wagoner, Kathryn	F	Caucasian	Director	2	0	12	6
Yadete, Tesfaye	M	Black	Advisor	1.5	0	0	2

Appendix D: Financial Analysis Summary

Developmental Math					
Cost	**08-09**	**09-10**	**10-11**	**11-12**	**12-13**
Direct Instructional Expenditures	1,004,847	1,542,832	1,931,606	2,117,825	2,320,299
Cost Per Student FTE	3,039	2,341	2,283	2,479	2,480
Funding	**08-09**	**09-10**	**10-11**	**11-12**	**12-13**
Appropriated Fund	267,607	311,394	378,455	417,708	419,911
Other:					
Special Legislative Appropriation					
Grants of Contracts					
Special Fees/Differential Tuition	737,239	1,231,438	1,553,152	1,700,117	1,900,388
Total	1,004,847	1,542,832	1,931,606	2,117,825	2,320,299

Note: Data provided by Provost's Office

Appendix E: External Community Involvement Names and Organizations

Name	Organization
Debi McKee	K-16 Alliance

Appendix F: External Community Involvement Financial Contributions

Organization	Amount	Type
N/A		Grant
		Contract
		Donation

Appendix G: Outcomes Data for Learning Outcomes

Learning Outcome 1:
Pass rates in Developmental Mathematics courses. (ABC grades divided by third week enrollment)

Pass Rates				
	Fall 2010	Fall 2011	Fall 2012	Fall 2013
Math 0950	45.1%	35.1%	39.9%	45.3%
Math 0990	25.2%	20.7%	31.3%	42.2%
Math 1010	48.1%	43.9%	39.0%	47.5%

Note: Data collected by Dev Math from Crystal Reports

Learning Outcome 3:
Pass rates in QL of students starting in Math 0950, Math 990, or Math 1010 compared to those directly placed in QL. (First attempt at the course between Summer 2007 and Spring 2013).

	Directly placed		Start in 950		Start in 990		Start in 1010	
QL course	N	% Passed	N	% Passed	N	% Passed	N	% Passed
1030	543	80.8%	58	87.9%	130	83.1%	262	83.20%
1040	270	76.30%	11	45.5%	16	50.0%	11	58.70%
1050	1254	71.80%	151	64.9%	258	67.1%	820	68.50%

Appendix H: Class Observation Rubric

Instructor Name: _____

Component	Unsatisfactory	Basic	Proficient	Distinguished
Creating an environment of respect and rapport	Interactions between the teacher and student, and among students, are negative, inappropriate, or insensitive, and are characterized by sarcasm, put-downs, or conflict.	Interactions between the teacher and students, and among students, are generally appropriate and free from conflict, but may be characterized by occasional displays of insensitivity or lack of responsiveness.	Interactions between the teacher and students, and among students, are polite and respectful, reflecting general warmth and caring, and are appropriate.	Interactions between the teacher and students, and among students, are highly respectful, reflecting genuine warmth and caring and are a model of sensitive communications.
Comments				
Encouraging mathematical discourse	Students are not given the opportunity to engage in mathematical discourse.	Students briefly engage in mathematical discourse by explaining and articulating mathematical ideas mostly to the instructor.	Students engage in mathematical discourse by explaining and articulating mathematical ideas to one another.	The majority of the mathematics-teaching portion of the class time allows students to explain and articulate mathematical ideas to one another. The teacher responds to student inquiries with questions/statements that promote further discourse.
Comments				
Engaging Students in a Community of Learners	Students are not at all intellectually engaged in the classroom community.	Students are intellectually engaged only partially either by not being included in groups, or due to a lack of appropriate groupings	Students are intellectually engaged throughout the teaching portion of the class time with appropriate groupings and engaged	Students are highly intellectually engaged throughout the teaching portion of the class time with appropriate groupings

		and/or engaged learning activities.	learning activities.	and engaged learning activities. Students contribute to the learning community.
Comments				
Using Relevant Engaged Learning Activities	Engaged learning activities are not used in the classroom.	Relevant engaged learning activities are partially or poorly implemented, or the activities are not relevant to student learning needs.	Relevant engaged learning activities are used with suitable structure and pacing.	Relevant engaged learning activities are used with suitable structure and pacing and allow for student reflection and closure.
Comments				

Using Assessment in Instruction	Assessment is not used in instruction.	Assessment is occasionally used in instruction, through some monitoring of progress of learning by teacher and/or students.	Assessment is regularly used in instruction, through self-assessment by students, instructor monitoring of student work, or other feedback systems.	Assessment is used in a sophisticated manner in instruction, through self-assessment by students, instructor monitoring of student work, or other feedback systems. Outcomes are used to guide the direction of the lesson.
Comments				