

# Developmental Math Demonstration Project: Project Overview & Results

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# About the Project

## **Goal:**

Investigate the potential of Khan Academy in developmental math courses and Accuplacer test preparation classes

## **Who:**

37 faculty members

1,226 students enrolled in DMDP-affiliated courses

## **What:**

Summer Boot Camps (268 students)

Developmental Math Courses (872 students)

College-level Math Courses (39 students)

## **Where:**

11 Institutions across five of the six New England states

## **When:**

Summer 2013 – Spring 2015

# About Khan Academy

- Free, online resource
  - Videos
  - Practice problems in math and other subjects.
- Users can
  - View and monitor progress
  - “Coach” each other

*“The ability to watch and take notes on how to work through math problems at my own pace is probably the best thing about Khan Academy.”*

The screenshot shows the Khan Academy interface for a user named Tim O'Connor (@timo2). The user's profile includes a green dinosaur avatar, a bio stating they teach Math at the Community College of Vermont and are a Khan Academy Implementation Coach, and a location of "Add your location". The user has 722,661 followers and 82 posts. Below the profile, there are four cards for "CURRENTLY WORKING ON":

Subject	Progress	Skills Mastered/Completed
Math: Algebra basics	100% progress	88/88 skills mastered
Coach resources: Reference materials	33% finished	48/145 skills completed
Math: Pre-algebra	90% progress	138/159 skills mastered
Math: Geometry	24% progress	19/111 skills mastered

*“I liked knowing if I was on the right track right away...and the “hints” that showed where I was going wrong...I found this much more helpful than doing all the problems at home incorrectly and not knowing until I got my work back”*



# Math Boot Camps

- Short review sessions to prepare students for math placement exams
  - 2-4 weeks
  - Often offered during the summer or winter sessions
  - Free to students
- Of students with subsequent course enrollment information, 34% enrolled in a math course their next semester.
  - 48% of continuing math students enrolled in a developmental math course
  - 52% enrolled in a college-level math course



# Developmental Math Courses

- Semester-long courses
  - Traditional lectures
  - Modular self-paced
- Of students with subsequent course enrollment information, 47% enrolled in a math course their next semester.
  - 67% of continuing math students enrolled in a developmental math course
  - 33% enrolled in a college-level math course



# College Level Courses

- Khan Academy was used in introductory courses as a supplemental math resource for students.
  - Landscape Design
  - Nursing
- No generalizable relationship between Khan Academy usage and course grades



# Implementation Models & Tools

- Blended Learning Using Curriculum Maps, Playlists and Coach Recommendations

Student level: Any level ▾ Within mission: Find topics or skills ▾ Activity from: All time ▾

Student Name ^	■	■	○	Points
Alh09281	13	33	473	184,118
Ayh07260	13	26	456	278,561
bad0723	6	46	1,491	123,612
cml04030	6	59	2,184	319,404
djg11020	3	41	987	216,735
drm2bfree74	22	38	4,515	795,627
EAH05170	6	58	1,481	466,160
eml03230	6	63	854	402,352
Kmm06131	5	49	696	256,685
Les03130	9	45	1,990	135,915
lxm08260	3	11	224	57,687
sag04160	2	4	97	56,795
Tim O'Connor	0	88	7,270	722,651

[eml03230](#) ⊕ Make a recommendation

Skills Recommendations Videos Badges Activity Focus

Now Due

due	Topic	Mastery Status	Questions	Goal
due May 4th	Factoring quadratics 1	Needs Practice <input type="checkbox"/>	2	5 in a row ✕
	<b>Late: Factor quadratics with a leading coefficient of 1</b>			
due May 4th	Factoring quadratics 2	Needs Practice <input type="checkbox"/>	1	5 in a row ✕
	<b>Late: Factor polynomials using quadratic methods</b>			
due May 4th	Multiplying binomials 2	Mastered <input checked="" type="checkbox"/>	5	5 in a row ✕
	<b>Find special products of binomials (basic)</b>			
due May 4th	Factoring linear binomials	Mastered <input checked="" type="checkbox"/>	5	5 in a row ✕
	<b>Factoring algebraic expressions using the distributive property</b>			
due May 4th	Factoring difference of squares 1	Practiced <input type="checkbox"/>	6	5 in a row ✕
	<b>Factor simple special products</b>			
due May 4th	Multiplying binomials 1	Mastered <input checked="" type="checkbox"/>	5	5 in a row ✕
	<b>Multiply binomials by binomials</b>			
due Apr 27th	Slope from a graph	Mastered <input checked="" type="checkbox"/>	13	5 in a row ✕
	<b>Slope from a graph</b>			
due Apr 27th	Intercepts from a linear equation	Struggling <input type="checkbox"/>	10	5 in a row ✕
	<b>Intercepts from a linear equation</b>			
due Apr 27th	Checking solutions to two-variable linear equations	Mastered <input checked="" type="checkbox"/>	5	5 in a row ✕
	<b>Checking solutions to two-variable linear equations</b>			
due Apr 27th	Graphing solutions to two-variable linear equations	Level Two <input type="checkbox"/>	9	5 in a row ✕
	<b>Graphing solutions to two-variable linear equations</b>			
due Apr 27th	Slope from two solutions	Struggling <input type="checkbox"/>	14	5 in a row ✕
	<b>Slope from two solutions</b>			





# Lessons Learned

- Support from college administration matters
- It took faculty more than one semester to find the most effective approach
- Implementation matters, beyond the tools used
- Using Khan Academy required more faculty prep time

*“I would like to hear about more best practices from other teachers, now that we have been going for a couple semesters. I know my way is not the best one”*



# Lessons Learned

- Khan Academy isn't for everyone (student or faculty); requires support and monitoring of changes to the website.

*"The practice problems were okay, but I'd rather have my professor help me out."*

- Khan Academy alone may not be enough.
  - Only 36% of student agreed that Khan Academy could replace a textbook
  - 67% agreed that Khan Academy can't replace their professor

*"My favorite part of using Khan Academy in this class was my professor. She helped me inside and out of the class. She clarified things that Khan Academy couldn't."*

