

Montana Digital Academy and the University of Montana

Personalized Learning for Math Readiness

EdReady is a math and English readiness system for anyone considering attending college in the United States. The purpose of EdReady is to help prepare students to avoid developmental instruction and begin their college studies by giving them the resources they need to achieve adequate scores on commonly used placement exams.

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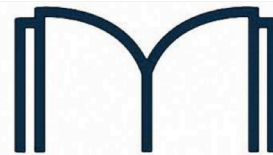
Background

The Montana Digital Academy (MTDA) provides unique educational opportunities to Montana students and schools. MTDA offers many core classes, AP classes, and electives that expose students to subjects that may not be available in their local schools. MTDA also offers credit recovery and remediation programs, eliminating course conflicts so that more students can graduate on time and college ready.

The University of Montana (UMT) is a selective institution in Missoula that hosts a population of roughly 15,000 students, where they receive a world-class education in a broad range of subjects that include the trades, liberal arts, graduate and postdoctoral study and professional training.

ALEKS Placement

All incoming freshmen (and transfer students still needing to meet their math requirement) who do not already have AP or college math credit must take a math placement exam before registering for a math course at UMT. The University has chosen to use ALEKS, a web-based testing and learning system. The ALEKS score determines the most appropriate math course for incoming students, including the need for any remedial courses in math.



MONTANA DIGITAL ACADEMY

15,000 full-time enrolled students on four campuses

BA, BS, MS, MA, and Ph.D. programs

<http://www.umt.edu>

Contact: Robert Currie, Executive Director, Montana Digital Academy

Pilot Details

Five college-math readiness tracks

Independent study

Tagged with:

Math Placement Exam Prep

Using EdReady

In Summer 2013, MTDA and UMT collaborated on an EdReady pilot designed to help students get into the college math course they need for their major interest. The Office for Student Success and Math Department at UMT offered “a *FREE, personalized, self-paced, skill strengthening program called EdReady*” to students who fell into three categories:

- 1) You have not met the prerequisites the University requires for the math class which is best for your educational goals but your placement score was close to the required level and you feel you have the dedication necessary to be in this class.
- 2) You met the prerequisites, but it's been a while since you took a math class or you narrowly accomplished the ALEKS cutoffs and are now struggling in the class.
- 3) You did not enroll in a math course this semester, but you wish to raise your ALEKS score so you can get into a higher math course in the Spring.

Students were asked to dedicate at least two hours a week to study and progress in their EdReady program. Holly Wright, Director of UMT's Math and STUDY JAM Tutoring Programs, served as an Academic Coach for the pilot and was available to answer questions and provide any additional help.

The program ran for a total of six weeks, from July 15 through August 23. Students were recruited via email and accessed EdReady remotely, usually from home. Their progress was entirely self-paced. The pilot offered five different EdReady pathways, corresponding to five different introductory math courses for different major tracks at UMT. Students self-selected the track (and EdReady version) that most closely aligned with their college goals.

Each EdReady pathway had a custom assessment that was tailored to the expectations of the corresponding introductory course. The target score was pre-set to 90 in all cases. If a student reached the target score, that student had the option to take (or re-take) the ALEKS placement exam, and the new ALEKS score would be accepted for advising and placement purposes. A student who mastered an easier track also had the option to pursue a harder track to try to get an even higher ALEKS score.

Outcomes and Evaluation

A total of 72 students participated in the pilot. See Table 1 for a breakdown of the number of students that pursued each of the five tracks. A number of students did not complete any activities after initially registering for an EdReady account, leaving 63 students for whom we had sufficient data to perform analyses. There were very few students in the Math 162 and 171 tracks, so we combined them in our analyses here. Finally, there were two students who did not reach the target score but re-took the ALEKS exam anyway and raised their scores. Those two students each logged over 10 hours of study time with the resources and raised their scores substantially, just not to the target. Because the time spent studying and some other activity data were not normally distributed, we use medians for most descriptive and analytic statistics.

| EdReady track: | Math 105 | Math 115 | Math 121 | Math 162 or 171 |
|--|------------|-------------|------------|-----------------|
| # students | 22 | 4 | 34 | 3 |
| % reached target | 73% | 50% | 65% | 33% |
| The following statistics are for students who reached the EdReady target score in each track | | | | |
| % raised ALEKS score | 75% | 100% | 95% | 100% |
| Median score gain | 36 | 54 | 46.5 | 33 |
| Median time studying resources | 331 | 506 | 431 | 137 |
| Median number of logins | 8 | 19 | 11 | 5 |

Analysis

Of the 41 students that utilized EdReady sufficiently to reach the target score, 35 of them (85%) raised their ALEKS score by 1 point or more (on a 5-point scale). The details of the relationship between success in EdReady and success on the ALEKS exam are illustrated in Figure 1. These results indicate that EdReady is a capable tool for students working alone to prepare for the ALEKS placement exam.

Students that used EdReady hit their target score

A number of analyses were conducted to better understand the differences among students who reached the EdReady target score versus those who did not.¹ Of the 63 students in our combined analysis, 22 (35%) did not reach the target score, and 41 (65%) did. These two groups did not differ in the median number of days they were active during the pilot period, nor did they differ in the median initial assessment score in EdReady. Differences did emerge, however, in the manner in which students used EdReady. Students who reached the target score spent significantly more time studying the resources (Yes = median 376 minutes; No = median 2 minutes. MWU test, U statistic: 146.0, $p < 0.001$) and logged into the system more frequently (Yes = median 9 times; No = median 4 times. MWU test, U statistic: 243.0, $p < 0.005$). In other words, nearly every student that chose to use the EdReady system achieved the target score (a median 376 minutes studying), while those that chose not to use EdReady did not reach the target score (a median 2 minutes studying). These differences, while not surprising, confirm that the benefits of using

In a survey of the students that participated in the pilot study, 90.9 % liked using EdReady, and 100% said EdReady improved their understanding of the required material

¹ The EdReady customized assessments for the different UMT programs of study are combined in these analyses, although the target score was the same in each case.

EdReady accrued to those students who actually used the program to study, as opposed to just trying to “game the assessment.”

EdReady accelerated placement exam score improvement

Plots of the relationship between the time spent studying and the resulting score gain (Figure 2 – uncorrected data; Figure 3 – log-corrected data) show that the time required for most students that used EdReady to achieve the target score and likely avoid math remediation was hours and days, rather than the weeks and months required by traditional math remediation classes. This finding suggests the possibility that EdReady, used in this manner, could support students achieving math college readiness in the period between college acceptance (in the Spring) and start of classes (in the Fall), thereby avoiding remedial courses and the delay of progress toward a higher education degree or certificate.

Finally, the non-linear distribution of the study time required to achieve the target score suggests the possibility that the self-remediation abilities among these math students differ substantially. These data indicate that most of the students (about 90%) achieve a rate of score gain such that the target score can be achieved in hours of study. By contrast, a small percentage of the participating students had a much slower rate of score gain and required weeks to achieve the same target score. Additional studies are needed to confirm these findings and to identify characteristics that distinguish these possible groupings.

Plans

The results of this Summer pilot were sufficiently promising to prompt interest in running additional pilots at UMT for the Fall term. Unlike the Summer pilot, this Fall pilot would center around an on-campus computer lab, and EdReady would be provided for supplemental math instruction rather than as a preparatory program for a specific readiness benchmark. This pilot is underway now.

“Refreshed what I needed to, didn’t waste my time, and I got into math 121!!”

- Pilot participant

About NROC and EdReady

NROC is a community-guided, non-profit project focused on new models of digital content development, distribution, and use. NROC is funded by The William and Flora Hewlett Foundation, the Bill & Melinda Gates Foundation, and most importantly by NROC members across the country. We are education leaders from state and system institutions nationwide who believe in open and equal access to education and the power of media to personalized learning. We represent more than 6 million U.S. students from middle school to college. Learn more at TheNROCProject.org.

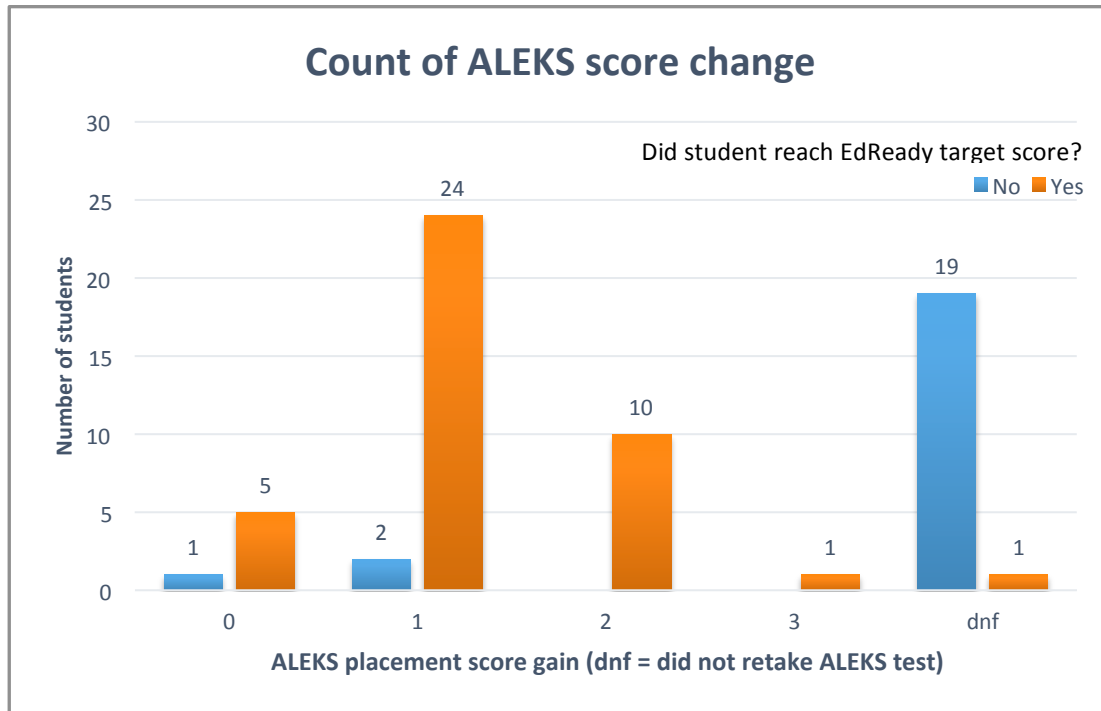


Figure 1: Chart of the breakdown of student performances for the pilot period on both the EdReady program and the ALEKS placement test. The x-axis groups students according to their performance on the ALEKS test: 0 = no change in ALEKS score, 1 = improved ALEKS score by one point, 2 = improved ALEKS score by two points, 3 = improved ALEKS score by three points, and dnf = did not re-take the ALEKS placement test. Note that the ALEKS placement test is a 5-point scale, with 1 being the lowest possible score. Each ALEKS group is further subdivided according to the performance on the EdReady pilot: Yes = the student reached the pre-set target score (of 90) in the EdReady pilot, and No = the student did not reach the target score. The y-axis is the count of the number of students in each category.



Figure 2: Plot of the relationship between the amount of time spent studying the recommended resources² and the score gained by that student. There appear to be three different clusters of “student-types.” First, there are those students who do not spend much – if any – time studying, and therefore also do not improve their scores (clustered at 0/0 of the X and Y axes). These students chose not to use EdReady. Second, there are those students who spent a great deal of time studying with EdReady (i.e., 30, 50, even 80 hours: the scattered points from 2,000+ minutes and more along the X axis). All of these students improved their EdReady scores, albeit slowly compared to the rest of the student population. Finally, the large majority of the students raised their scores at a rate of roughly 4 points per hour studied (on a 100-point scale), sufficient to reach the target score in most cases with less than 16 hours of study.

² “Time spent studying the recommended resources” is the time recorded by EdReady. While EdReady will automatically log out a user after 30 minutes of inactivity, the total time logged in can be an over- or under-estimate of the actual time spent studying the recommended resources, depending on what fraction of the study time was spent within the EdReady system.

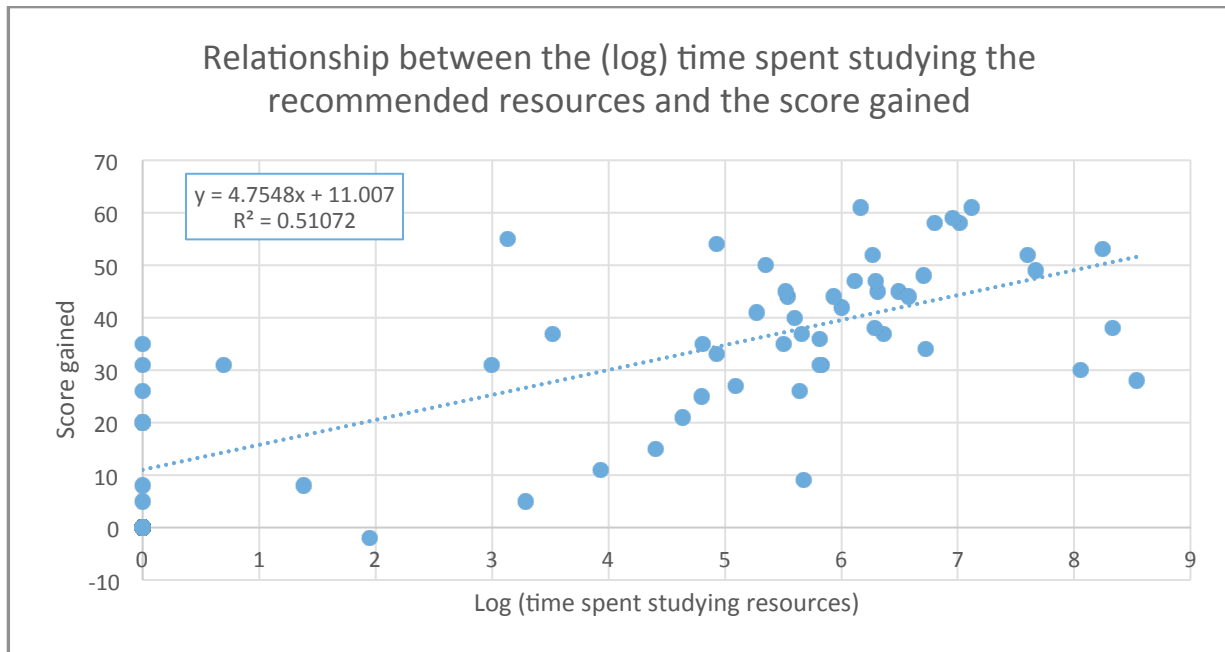


Figure 3: Graph of the relationship between the log of the amount of time spent studying the recommended resources and the score gained by that student (Linear regression analysis, $F = 63.7$; $p < 0.001$). This analysis further illustrates the exponential distribution of the “rate of score gain” in the pilot population.