A REVIEW OF THE USE OF SMARTHINKING TUTORIAL PRODUCTS IN THE FLORIDA COLLEGE SYSTEM

INTRODUCTION

Smarthinking is a Washington, D.C. based company that provides a range of tutorial services.[1] The Division of Florida Colleges (Division) in the Department of Education has contracted with Smarthinking to help provide these services to each of the 28 institutions in the system. Due to the economic investment in this service, the Division seeks to ensure the service positively impacts student success.

The Division hired a private contractor to investigate the effect of using the Smarthinking tutorial services on student grades and to determine if the amount of use had any impact. The data used for the project included information on the amount of time students spent on Smarthinking, the subjects studied, and the number of visits. Data were also extracted from student data provided by the institutions, which included information on courses taken and grades earned.

METHODOLOGY

Smarthinking provided the Division with a data file containing the subject and type of tutoring for each student participating in Florida. The Smarthinking data also included length of time using the tutorial and the number of times the tutorial service was accessed as items in the review. These data were combined with the course and grade information from the 2009-2010 Student Data Base, making it possible to determine the outcomes for Smarthinking students.

Although Smarthinking offers tutoring for a much wider range of subjects, only some subjects were utilized by students in The Florida College System. In 2009-2010 this included algebra, basic math skills, calculus, writing (the essay center, paragraph submission, and writing for all subjects), general chemistry, geometry and trigonometry, introduction to accounting, physics, and statistics. However, only algebra and the essay center had enough participation to make conducting an analysis feasible. For each area, the grades received by Smarthinking students were compared to students who did not access the tutoring services. This was done at the system level due to the small number of unique individuals who accessed the Smarthinking tutorial.

[1] http://www.smarthinking.com/

OVERALL RESULTS

Table 1 shows the results in grade point averages (GPA) for Smarthinking and non-Smarthinking students. The GPA was derived from the courses contained in the 2009-2010 Student Data Base and may not be the same as the student's cumulative GPA. Overall the Smarthinking group had a higher 2009-2010 GPA than did those who did not participate in the program during the year. The highest GPAs were for those students who used the program over 135 minutes and who accessed the program one time. While there were some differences among the session types, they were fairly small with the online writing lab indicating the highest GPA.

Table 1 – Overall Smarthinking Results

All Courses	**Smarthinking**		**Non-Smarthinking**	
	# Students	**Average GPA**	**# Students**	**Average GPA**
Overall	**1,750**	**3.00**	**627,457**	**2.73**
Time Spent (in minutes)				
1 – 0 to 15	56	2.85		
2 – 16 to 30	102	2.98		
3 – 31 to 45	544	3.00		
4 – 46 to 60	61	2.77		
5 – 61 to 75	55	3.03		
6 – 76 to 90	310	2.96		
7 – 91 to 105	43	3.01		
8 – 106 to 120	144	3.01		
9 – 121 to 135	30	3.05		
10 – Over 135	377	3.11		
Number of Times Used				
1	803	3.04		
2	828	2.97		
3	68	3.00		
4	28	2.99		
5	14	2.95		
6	*	2.86		
7	*	3.61		
8	0			
9	*	4.00		
Session Type				
Live Tutoring Session	497	2.99		
Off Line Session	69	2.92		
On Line Writing Lab	1,156	3.02		

*Since there were less than 10 students, the data for this row will not be considered part of the analysis.

Source: Division of Florida Colleges.

The difference in GPA between the students participating in a Smarthinking tutorial and the others may be a combination of both the effect of the tutorial and a self-selection process in which better students are more likely to choose to participate in the program. To address this concern, the incoming College Preparatory Test (CPT) results were checked for each of the two subgroups. Table 2 indicates there was no practical difference between the scores earned by the groups. Given the two groups had comparable CPT scores but that the Smarthinking participants had higher grades, this suggests that at least some portion of GPA gains were due to participation in the Smarthinking program.

Table 2 – Average CPT Scores for Smarthinking and Non-Smarthinking Students

Subtest Area	Smarthinking		Non-Smarthinking	
	# Students	Average Scores	# Students	Average Scores
Mathematics	1,086	58.2	317,411	56.9
Reading	1,153	79.5	307,769	79.7
Writing	1,130	85.1	309,781	85.6

Source: Division of Florida Colleges.

SUBJECT AREA RESULTS

The next phase of the investigation was to look at the results of the two subject areas that had more than 80 students participate statewide: algebra and essay center. Rows with less than 10 students are omitted from the accompanying tables.

ALGEBRA

The courses chosen for this subject were the first college-level algebra course, MAC1105, and the intermediate algebra course, MAT1033, which is used as a bridge course between developmental mathematics and college level courses. Since the tables are presented on a course-by-course basis, the number columns refer to the actual number of individual students.

The overall GPA of the Smarthinking and non-Smarthinking groups was practically the same, as shown in Table 3. The GPAs indicate that the more time spent with the algebra sessions, the better the grade in MAC1105. The number of times accessed and the session type were the same as the overall results with one time and live session resulting in higher GPAs.

Table 3 – Smarthinking Results for Students in Algebra and MAC1105

MAC1105	Smarthinking		Non-Smarthinking	
	# Students	Average GPA	# Students	Average GPA
Overall	**108**	**2.42**	**79,766**	**2.37**
Time Spent (in minutes)				
1 – 0 to 15	15	2.00		
2 – 16 to 30	16	2.38		
10 – Over 135	47	2.60		
Number of Times Used				
1	56	2.57		
2	34	2.18		
Session Types				
Live Tutoring Session	98	2.45		
Offline Session	10	2.10		

Source: Division of Florida Colleges.

It is interesting to note that of the students enrolled in MAC1105 the average mathematics CPT scores for non-Smarthinking students was higher than that of Smarthinking students. Despite this, the overall GPAs were practically the same. Moreover, their scores in other subject areas were fairly comparable. There is no indication, at least from the test data, that the Smarthinking students were more successful due to self-selection, which suggests that Smarthinking use may have helped close some of the gaps for the students using the system.

Table 4 – Average CPT Scores for Smarthinking and Non-Smarthinking Students in MAC 1105

MAC1105	Smarthinking		Non-Smarthinking	
Subtest Area	**# Students**	**Average Scores**	**# Students**	**Average Scores**
Mathematics	**68**	**61.6**	**42,482**	**69.2**
Reading	69	84.2	39,201	82.8
Writing	66	90.2	39,522	89.2

Source: Division of Florida Colleges.

MAT1033 was developed as a bridge course between the skills learned in developmental education and those needed for college algebra (e.g. MAC1105). All developmental mathematics students are required to take MAT1033 following completion of the developmental education sequence.

In MAT1033, as opposed to MAC1105, the Smarthinking students' GPAs were higher than that of the non-Smarthinking students, as shown in Table 5. Using the tutorial one time and using live tutoring sessions resulted in higher GPAs than did other options. The time spent was different than MAC1105, with the highest GPA belonging to those spending between zero and fifteen minutes. However, the small number of students in this category implies this data point should be checked using other students prior to its acceptance.

Table 5 – Smarthinking Results for Students in MAT1033

MAT1033	Smarthinking		Non-Smarthinking	
	# Students	**Average GPA**	**# Students**	**Average GPA**
Overall	**106**	**2.44**	**79,637**	**2.12**
Time Spent (in minutes)				
1 – 0 to 15	10	2.75		
2 – 16 to 30	23	2.24		
10 – Over 135	38	2.53		
Number of Times Used				
1	51	2.55		
2	36	2.26		
3	13	2.38		
Session Types				
Live Tutoring Session	95	2.49		
Offline Session	11	2.00		
Online Writing Lab	0			

Source: Division of Florida Colleges.

Table 6 shows the average CPT scores for Smarthinking and non-Smarthinking students. There is not a lot of practical difference on CPT scores between the two groups taking MAT1033 and the overall groups. This implies that the GPA gains of the Smarthinking group were due to participation in the tutorial.

Table 6 – Average CPT Scores for Smarthinking and Non-Smarthinking Students Enrolled in MAT 1033

MAT1033	Smarthinking		Non-Smarthinking	
Subtest Area	**# Students**	**Average Scores**	**# Students**	**Average Scores**
Mathematics	**77**	**56.1**	**54,090**	**57.8**
Reading	70	81.4	48,653	80.6
Writing	71	87.1	49,408	86.5

Source: Division of Florida Colleges.

ENGLISH

Since it is possible that the essay center might be used by both college level and developmental level students, the courses selected for the essay center were the first college level English course, ENC1101, and a combination of developmental education English courses, ENC0xxx. The Statewide Course Numbering System in Florida designates developmental English courses with level "0". However, course numbers may vary among colleges. Accordingly, all developmental education courses are collapsed into a single course number labeled ENC0xxx.

The overall GPA for the Smarthinking students was higher than that of the non-Smarthinking students, as shown in Table 7. As with some other examinations, the students who spent at least 135 minutes with the tutorial had better GPAs than those who spent less time. In this case, accessing the tutorial at least twice seemed to result in a better grade than using the services only once.

Table 7 – Smarthinking Results for Student ENC1101and Using the Essay Center

ENC1101	Smarthinking		Non-Smarthinking	
	# Students	Average GPA	# Students	Average GPA
Overall	**672**	**2.98**	**117,198**	**2.63**
Time Spent (in minutes)				
3 – 31 to 45	264	2.82		
6 – 76 to 90	166	2.99		
8 – 106 to 120	84	2.94		
10 – Over 135	143	3.24		
Number of Times Used				
1	295	2.86		
2	363	3.08		
Session Types				
Live Tutoring Session	0			
Offline Session	0			
Online Writing Lab	671	2.98		

Source: Division of Florida Colleges.

Table 8 shows the average CPT scores for Smarthinking and non-Smarthinking students. Again there are no large differences in any of the CPT scores of the two groups. However, the GPA for the Smarthinking students is higher, suggesting a positive benefit to Smarthinking use.

Table 8 – Average CPT Scores for Smarthinking and Non-Smarthinking Students

ENC1101	Smarthinking		Non-Smarthinking	
Subtest Area	**# Students**	**Average Scores**	**# Students**	**Average Scores**
Mathematics	392	61.1	74,981	58.3
Reading	**438**	**84.0**	**75,049**	**83.5**
Writing	**450**	**90.0**	**76,799**	**89.0**

Source: Division of Florida Colleges.

As with the ENC1101, participating in the Smarthinking tutorial seemed to enhance the average GPA for students in ENC0XXX. Table 9 shows that Smarthinking participants had an average GPA of 2.63 as compared to 2.36 for non-participants.

Table 9 – Smarthinking Results for Student Enrolled in ENC0XXX and Using the Essay Center

ENC0xxx	Smarthinking		Non-Smarthinking	
	# Students	Average GPA	# Students	Average GPA
Overall	**185**	**2.63**	**32,690**	**2.36**
Time Spent (in minutes)				
3 – 31 to 45	55	2.71		
6 – 76 to 90	56	2.59		
8 – 106 to 120	19	2.47		
10 – Over 135	44	2.58		
Number of Times Used				
1	71	2.75		
2	110	2.56		
Session Types				
Online Writing Lab	185	2.63		

Source: Division of Florida Colleges.

As with the previous comparisons, the average CPT scores were close for the two groups, suggesting that the observed differences in GPA is due, at least in part, to participation in Smarthinking.

Table 10 – Average CPT Scores for Smarthinking and Non-Smarthinking Students

ENC0xxx	Smarthinking		Non-Smarthinking	
Subtest Area	**# Students**	**Average Scores**	**# Students**	**Average Scores**
Mathematics	133	48.4	26,442	43.0
Reading	**155**	**67.5**	**28,104**	**65.9**
Writing	**155**	**66.2**	**29,514**	**66.4**

Source: Division of Florida Colleges.

CONCLUSION

Overall, the Smarthinking tutorial programs appear to provide assistance to students who are taking either developmental education courses or the first college-level course in mathematics or English. In general, students using Smarthinking services have slightly higher grades in their related courses. Because the CPT scores of the participants and non-participants are very similar, this does not appear to be a result of self-selection, with stronger students electing to participate. It is possible that other, non-academic factors, such as motivation and personal determination, as well as age, gender, ethnicity, and hours of employment are related to the use of Smarthinking. Based on the available data, however, it appears that Smarthinking use contributes to higher grades within key courses.

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