ON-LINE ALCOHOL HEALTH EDUCATION CURRICULUM EVALUATION: HARM REDUCTION FINDINGS AMONG FRATERNITY AND SORORITY MEMBERS

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This study examines the use of technology as a tool in the broad-based delivery of alcohol health education within fraternities and sororities. Building on the promise of multimedia education, this evaluation examines an alcohol abuse prevention program delivered through an interactive web-based format for reducing the harm associated with alcohol abuse. The evaluation uses a clustered randomly assigned post-test only evaluation design with 3,552 individuals in 340 chapters to examine differences between individuals who have and who have not received the educational curriculum. The outcome of the study is building evidence that technology-delivered alcohol education has potential to modestly impact academic and personal harm associated heavy alcohol use.

The values espoused by fraternal organizations speak to service, leadership, and academic excellence, but are challenged in practice, by a hedonistic fraternal culture. Membership in fraternities and sororities can represent the best of what it is to be a college student, yet all too often members are simultaneously plagued with problematic heavy alcohol use. Harm related to alcohol in fraternal organizations mirrors overall harm to college students that ranges from annoying noise, interpersonal violence, property damage, and occasionally alcohol related fatalities (Hingson, Heeren, Zakocs, Kopstein, & Wechsler, 2002; Perkins, 2002). Fraternities and sororities are frequently identified by researchers as being among the highest risk groups in college for harm related to alcohol (Baer et al., 1995; Nelson et al., 2001; Presley et al., 2002; Wechsler et all., 2000). Fraternal organizations are an identified population for prevention services, but campus professionals working with these groups face few clear program or policy options that have displayed evidence of effectiveness with at risk students (Walters, Bennett & Noto, 2000). Administrators and advisors are particularly in need of proactive, preventive interventions that are palatable for students and at the same time can reach members with efficiency and integrity.

The most promising prevention program options to date are one-to-one or small group interaction that has limited economy of scale (Hunter & Mazurek, 2004; McNally & Palfai, 2003). Program formats such as brief screening and feedback of heavy drinking have strong evidence of efficacy for heavy college drinkers, specifically with fraternity and sorority affiliated students, but are limited in their scale by resource intensity. Efforts that have a greater economy of scale such as social marketing and alcohol alternative events have far more mixed evaluation findings as to their impact (Wechsler et. al., 2003).

In the Internet era, online preventive educational interventions hold special promise. Interactive technology as an out-of-class learning modality has economy of scale, consistent education messages and can be interactive with messages geared to the interests and information needs of a given user (Reis, Riley, Lokman, & Baer, 2000; Wall & Cox, 2001). Location of delivery is far more flexible than other types of presentations as they can take place anywhere a personal computer can be connected to the Internet.

In fulfilling a duty to care, be it on academic achievement, public health, or legal grounds, advisors of fraternal organizations have a special challenge and opportunity (Bickel & Lake, 1999; Powell & Wechsler, 2003: Wechsler et. al., 1999). The challenge exists in addressing students who are the most likely to experience harm associated with alcohol use (Wechsler, et al., 1998). The opportunity exists in the ability to target resources and programs toward students who are known to be in need, thus having greater opportunity to prevent possible harm. While affiliated members have been shown to heavily consume alcohol more often than many of their college attending peers, fraternities and sororities can be strong social networks with a rich opportunity to utilize education as a tool to combat potential harm from alcohol misuse and abuse (Presley et al., 2002; Wechsler et all., 2000). Fraternity and sorority affiliated members are also unique in that they can be served by both campus staff members where they have residence (horizontal access), or via the inter/national organization of which their local chapter is a part (vertical access). The use of technology is a unique format that allows inter/national fraternities and sororities access to their members throughout the United States and Canada. On campus, technology as a delivery mechanism for alcohol education holds promise in that participation can be tracked centrally and implementation does not require a fleet of faculty, staff, or student peer educators in order to reach a geographically dispersed fraternity and sorority population.

Program Description

This report summarizes evidence on the short-term impact of a commercially available online alcohol prevention program called AlcoholEdu that was delivered to fraternity and sorority affiliated members during the 2003-04 academic year. AlcoholEdu provides students with feedback about their alcohol behavior, information about alcohol use, skill development for functioning in a social environment, and reflection of how alcohol fits into an individual's life (Agostinelli, Brown, & Miller, 1995; Baer et al., 2001; D'Amico & Fromme, 2000; Kivlahan et. Al. 1990; Marlatt et al., 1998; McNally & Palfai, 2003; Peeler et al., 2000, Wall, 2005; Walters, Bennett, & Miller, 2000). The curriculum builds upon previous technology used to deliver alcohol education such as Alcohol 101, a broadly adopted and conceptually promising alcohol education tool (Michael, 2000; Sharmer, 2001; Reis, Riley & Baer, 2000). Past technology delivered alcohol education curriculums have used CDs or disks to facilitate student interaction with the program, while AlcoholEdu utilizes a web interface.

Students progress through AlcoholEdu by opening up their web browser, logging on to the program, and completing a pre-survey of their alcohol attitudes and beliefs. Following the pre-survey, students complete five online learning chapters plus a pre-course introduction, a journal, two knowledge tests, followed by a post-survey immediately upon course completion. A follow-up survey is completed four to six weeks after course completion.

The AlcoholEdu curriculum is built on three domains, all of which are documented as predictive factors in the extensive literature on young adults and alcohol use. Two chapters (one and three) address alcohol expectancies as related to peer influence, advertising, and behavioral and legal consequences of excessive use. Chapters two and four introduce the user to concepts of Blood Alcohol Concentration and the physiological parameters of alcohol use. The final chapter presents ideas of self-efficacy as related to safe and responsible drinking.

The content of the five chapters within AlcoholEdu is experienced in a linear fashion through streaming video, static content information, interactive web pages including decision trees and brief feedback, and reflective journaling. The intent of the program is to deliver each of the five chapters

to students using varied learning approaches that program developers described as following the Bloom (1956) taxonomy of learning. Learning is facilitated by utilizing the taxonomy in the curriculum by presenting information related to alcohol and cognitive functioning as an example of cognitive knowledge acquisition, then examined in post information questions to indicate application and synthesis of the information. Interactive case studies related to social situations are used to provide opportunities to apply knowledge and examine attitudes and values that students experience in making alcohol related choices. Reflection through journaling further facilitates knowledge synthesis and personal skill integration.

Even with varied learning approaches, the program is linear in that individuals progress sequentially from chapter one to five. Within this linear design, there is customization of chapters by gender and drinking status of participants. Customization creates four unique paths through the program, including: (1) men who report consuming; (2) men who report abstaining; (3) women who report consuming; and (4) women who report abstaining from alcohol. Examples of customization would include shifting scripted language for individuals who are abstainers of alcohol as compared to self-reported consumers. Consumers of alcohol receive a message of moderating consumption, while an abstainer receives messages reinforcing their choice to refrain from alcohol use. Customization by gender would include comparison points in feedback associated with blood alcohol level whereby a female student would be compared to other females and male to other males. Program content concludes with a knowledge quiz, or test, to assure a minimum level of comprehension prior to students logging off their online experience.

Methods

Results for fraternity and sorority affiliated members are a subset of a larger evaluation study of AlcoholEdu that involved 23,127 student responses. For this study, online surveys were completed by college students at institutions of higher education as part of the AlcoholEdu online alcohol education program during the 2003-04 academic years. Program participants completed three attitudinal and behavior based surveys with the timing of survey administration being: (1) A 36 question pre-survey completed prior to commencing the program: (2) A post-survey completed immediately after completing the curriculum; and (3) A 21 question follow-up survey completed four to six weeks after completing the program (Table 1). All surveys were completed using a web page survey format. Data for the analysis presented here are from 4,552 sorority and fraternity students documented to have completed all program elements and all surveys. The students responses used in this study represent individuals from 340 different fraternity and sorority chapters (campus level chapter groupings) from institutions of higher education in the United States and Canada.

A post-test only design was constructed after one year of deployment of the AlcoholEdu program. Students were randomly assigned each month of the 2003-2004 academic year to the pre-intervention group or the intervention group. Thus, the analysis compares the follow-up survey responses of the intervention group, with the pre-survey responses of the comparison group at similar time points across the 2003-04 academic year. The 4,552 students were randomly assigned to study groups by chapter and campus affiliation. The 340 identified fraternity and sorority chapters reflect the naturally occurring learning environments in which AlcoholEdu was used by the students.

Table 1
Negative Consequence Confirmatory Factor Analysis

Variables (N=23,127)	Factor Loading				
	1	*2*	*3*	*4*	*5*
Academic Negative Consequences					
(Cronbach Alpha = .830)					
Miss a class?	.770				
Find yourself unfocused in class?	.804				
Attend a class unprepared?	.795				
Miss a deadline for a class?	.693				
Attend a class drunk?	.680				
Attend a class hung over?	.727				
Negative Consequences Physical Health or Work					
(Cronbach Alpha = .755)					
Perform poorly in athletics?		.671			
Vomit in public?		.617			
Deliberately vomit to get rid of alcohol and continue to drink?		.651			
Injure yourself?		..514			
Get into a physical fight?		.668			
Miss going to work?		.644			
Drinking and Driving					
(Cronbach Alpha = .829)					
Drive while impaired from alcohol or intoxicated?			.851		
Drive after or while drinking?			.897		
Hangover/ Mental Impact					
(Cronbach Alpha = .768)					
Have a hangover				.735	
Have to be prompted to remember something you did?				.842	
Awaken from a night of drinking not able to remember things that you did or places that you went?				.793	
Negative Sexual Consequences					
(Cronbach Alpha = .778)					
Have a one-night stand with a casual sexual partner?					.777
Have sexual intercourse when you ordinarily would not?					.812
Fail to use safer sex practices when you ordinarily would have?					.741

For the purpose of this study, it was assumed that the two surveys (pre-survey and post-survey) administered immediately prior to and after the online instruction have a programmatic, or intervention, effect on the follow-up survey results for the intervention group. The programmatic effect is not distinguished from the potential press for social acceptability, boredom, or other factors that may occur due to the completion of multiple similar surveys.

Six dependent variables were examined in the analysis. Five measures were derived from 20 items related to self-reported negative consequences that follow the stem question, "In the past two weeks, if you were drinking, did you . . .?" The twenty items were conceptually grouped and then confirmatory factor analysis was conducted as reported in Table 1. Scales were created using the entire study dataset (N=23,127) in a summative format due to the dichotomous coding of original items. The scales developed include: (1) Negative academic consequences; (2) Negative physical or work consequences; (3) Drinking and driving; (4) Hangover/mental impact and (5) Negative sexual consequences. The scales had Cronbach alphas ranging from .830 to .755.

The sixth dependent measure, incidents of heavy alcohol consumption, was created from the self-reported number of drinks each individual had over the past two weeks. Students were asked to

indicate how many times in the past 14 days they had consumed 5 or more drinks in one sitting. A two-week average was then computed from all days reported with this amount of consumption (each day with five plus drinks coded as one).

The general pattern of individual's background characteristics shows similarities between the intervention and comparison groups (see Table 2). The majority of the participants (89% & 90%) were under the age of 21 and Caucasian (90% & 93%). The intervention group had a lower percentage of men (43%) than the comparison group (51%). When looking at the living arrangements, the intervention group differed from the comparison group in the percentage of students living in a residence hall on campus (51% versus 42%) and percent living in a fraternity or sorority facility (16% versus 26%). Otherwise, the two groups were roughly equal in the percentage of students living in substance free housing (6%), in apartments (18%) or at home (3%). Science was the most frequently cited major, (26% & 27%), followed by business (20% & 21%) and the social sciences (16% & 17 %).

Table 2
Background Variables in Study Data

Background Variable	Percentage		N		Conceptual Rationale for Inclusion
	Intervention	*Comparison*	*Intervention*	*Comparison*	
Gender					Past prevalence research has shown gender to be associated with alcohol use and related behavior.
Male	43.1	50.5	891	986	
Female	56.9	49.5	1176	967	
Age					Past prevalence research has shown age to be associated with alcohol use and related behavior, specifically use increases from 18 to 21 then levels off.
18	36.4	29.6	753	579	
19	35.0	33.9	724	663	
20	14.5	18.1	300	353	
21	9.6	11.3	198	221	
22	3.1	5.8	65	114	
23	1.3	1.2	27	23	
24 or older	-	-	-	-	
Race/Ethnicity					Past prevalence research has shown race/ethnicity to be associated with alcohol use and related behavior. White or Caucasian background is positive associated with alcohol use and related behavior.
White/Caucasian	92.7	89.6	1916	1749	
Black/African American	1.1	1.4	23	27	
Asian/Pacific Islander	4.3	7.2	89	141	
Hispanic/Latino	3.3	3.6	68	71	
Indian/Native American	.8	.6	16	11	
GPA					Past prevalence research has shown self-reported GPA to be associated positively with alcohol use and related behavior.
A+	3.5	3.1	72	60	
A	18.4	15.2	381	296	
A-	22.4	23	462	450	
B+	19.6	19.3	406	376	
B	18.9	21.9	391	427	
B-	8.9	9.2	183	179	
C+	5.1	5.1	105	100	
C	2.6	2.7	54	52	
C-	.4	.5	9	9	
D	.1	.2	3	4	
F	.0	.0	1	-	

Table 2, cont.
Background Variables in Study Data

Background Variable	Percentage		N		Conceptual Rationale for Inclusion
	Intervention	*Comparison*	*Intervention*	*Comparison*	
Abstainer From Alcohol	2.9	12.7	57	249	The prevalence of self-described abstainers from alcohol is an important variable to control for in the study groups.
Living arrangements for college					Past prevalence research has shown that college living arrangements to be associated with alcohol use and related behavior. Specifically living in college residence hall and fraternity or sorority have been positively associated with alcohol use and related behavior, while living in substance-free housing is negatively associated.
College residence hall	51.4	42.3	1062	827	
Substance-free residence hall	6.0	5.7	124	111	
Fraternity or sorority	16.1	26.0	333	507	
On-campus apartment or house	3.5	5.1	72	99	
Off-campus apartment or house	15.1	13.3	312	259	
At home with family	2.9	2.7	60	53	
Other	.3	.2	6	4	
Major					Past prevalence research has shown academic engagement, sometimes measured by curriculum to be associated with alcohol use and related behavior. Major is used as a proxy here for academic engagement.
Sciences	27.4	26.3	566	513	
Social sciences	15.8	17.1	327	333	
Humanities	9.0	8.8	185	172	
Business	19.5	21.3	403	416	
Undecided	9.7	8.9	201	174	
Other	13.4	12.4	276	243	

In this analysis, all surveys included a time stamp, denoting the day of the year that a particular survey was completed. The time stamp was used to group survey responses into four-week time intervals, to allow for comparison of survey responses at similar points time during the 2003-04 academic year. The time blocks used in this analysis began July 1, 2003 and ended June 20, 2004. There were 13 time blocks created, numbering 1 to 13 as denoted in Tables 3 and 4. Time stamping allowed for a comparison of individuals who had completed the program, called the intervention group, to those who have not yet completed the program, called the comparison group, at similar time points. Tables 3 and 4 provide a description of the trends associated with the six dependent measures in the study across time blocks: (1) incidents of negative academic consequences; (2) incidents of hangover/mental impact; (3) incidents of heavy consumption days; (4) drinking and driving; (5) negative incident physical or work related; and (6) negative sexual consequences. The trends revealed that when considering the mean responses within a four-week time block, the intervention group trend was generally lower on the first three of these measures than the comparison group and the remaining three measures did not have a trend. Both groups reported increased incidents of negative consequences and heavy consumption from the beginning of 2003 until well into 2004.

Table 3
Time Blocks and Incidents of Heavy Alcohol Consumption and Negative Consequence Scales

			Negative Academic Consequence Scale		Negative Consequence Hangover/ Mental Impact		Incidents of consuming five or more drinks in one day over past two weeks	
Time Frame[a]	N	Time Period	*Intervention*	*Comparison*	*Intervention*	*Comparison*	*Intervention*	*Comparison*
1st	2	7/1/03 - 7/20/03	Excluded[b]	Excluded[b]	Excluded[b]	Excluded[b]	Excluded[b]	Excluded[b]
2nd	12	7/21/03 - 8/17/03	Excluded[b]	Excluded[b]	Excluded[b]	Excluded[b]	Excluded[b]	Excluded[b]
3rd	158	8/18/03 - 9/14/03	Excluded[b]	Excluded[b]	Excluded[b]	Excluded[b]	Excluded[b]	Excluded[b]
4th	619	9/15/03 - 10/12/03	0.71	0.85	0.75	0.85	2.73	1.99
5th	667	10/13/03 - 11/9/03	0.47	0.78	0.56	0.90	1.57	1.70
6th	524	11/10/03 - 12/7/03	0.44	0.85	0.58	1.13	1.48	1.74
7th	225	12/8/03 - 1/4/04	0.17	0.97	0.46	0.97	1.29	2.06
8th	341	1/5/04 - 2/1/04	0.29	0.74	0.57	0.97	1.43	1.58
9th	297	2/2/04 - 2/29/04	0.65	0.77	0.58	0.96	1.52	2.17
10th	556	3/1/04 - 3/28/04	0.96	0.71	0.96	0.83	2.23	2.49
11th	323	3/29/04 - 4/25/04	0.66	0.88	0.69	.072	1.90	2.09
12th	258	4/26/04 - 5/23/04	Excluded[b]	Excluded[b]	Excluded[b]	Excluded[b]	Excluded[b]	Excluded[b]
13th	7	5/24/04 - 6/20/04	Excluded[b]	Excluded[b]	Excluded[b]	Excluded[b]	Excluded[b]	Excluded[b]

[a]Four-week time block.
[b]Excluded for less than 20 individual responses in either intervention or comparison cell in this time block.

Table 4
Time Blocks and Incidents of Heavy Alcohol Consumption and Negative Consequence Scales

			Negative sexual consequences		Drinking and driving		Negative consequences physical or work	
Time Frame[a]	N	Time Period	*Intervention*	*Comparison*	*Intervention*	*Comparison*	*Intervention*	*Comparison*
1st	2	7/1/03 - 7/20/03	Excluded[b]	Excluded[b]	Excluded[b]	Excluded[b]	Excluded[b]	Excluded[b]
2nd	12	7/21/03 - 8/17/03	Excluded[b]	Excluded[b]	Excluded[b]	Excluded[b]	Excluded[b]	Excluded[b]
3rd	158	8/18/03 - 9/14/03	Excluded[b]	Excluded[b]	Excluded[b]	Excluded[b]	Excluded[b]	Excluded[b]
4th	619	9/15/03 - 10/12/03	0.27	0.17	0.13	0.15	0.38	.026
5th	667	10/13/03 - 11/9/03	0.10	0.13	0.1	0.11	0.15	0.19
6th	524	11/10/03 - 12/7/03	0.10	0.20	0.09	0.13	0.21	0.16
7th	225	12/8/03 - 1/4/04	0.09	0.14	0.10	0.06	0.11	0.97
8th	341	1/5/04 - 2/1/04	0.09	0.10	0.13	0.07	0.16	0.19
9th	297	2/2/04 - 2/29/04	0.12	0.25	0.16	0.12	0.26	0.23
10th	556	3/1/04 - 3/28/04	0.17	0.13	0.11	0.19	0.36	0.23
11th	323	3/29/04 - 4/25/04	0.11	0.06	0.09	0.09	0.26	0.19
12th	258	4/26/04 - 5/23/04	Excluded[b]	Excluded[b]	Excluded[b]	Excluded[b]	Excluded[b]	Excluded[b]
13th	7	5/24/04 - 6/20/04	Excluded[b]	Excluded[b]	Excluded[b]	Excluded[b]	Excluded[b]	Excluded[b]

[a]Four-week time block.
[b]Excluded for less than 20 individual responses in either intervention or comparison cell in this time block.

Results

Linear regression analysis was conducted for the six dependent variables. The regression model was theoretically driven and then modified for parsimony based upon results of each analysis. Model development included four-week time blocks, background and environmental variables (see Table 2 for background and environmental variables). Effect of group assignment was assessed with the study group variable for which the intervention group was coded as 1 and the comparison group was coded as 0. The four-week time blocks with at least 20 responses in both the intervention and comparison group were included as variables in the analysis to control for the time of year each survey was completed (N=4,552). Each four-week time block was coded as 1 for survey being completed during that period or 0 for survey not completed during that period. Time blocks 4 to 11 were included in one analysis (see Table 3 for corresponding calendar dates). A second set of results are reported that compare men to men and women to women over the same time block.

Background independent variables in the analysis included: gender (1= female, 0= male); age (1=18 to 7=24 and above); grade point average (1=A to 11=F); White, non-Hispanic (1= yes, 0= no); and business major (1= yes, 0= no). Environmental independent variables in analysis included: living in

a fraternity or sorority facility (1= yes, 0= no); living at home (1= yes, 0= no); and living in a substance free residence hall (1= yes, 0= no). The final independent variable in analysis denoted those individuals who self-reported being abstainers (1= yes, 0= no) of alcohol. It is interesting to note that approximately 95% of those who reported abstaining from alcohol also self-reported having no alcohol in the past two weeks, thus in part substantiating the validity of student self report.

The results of the regression analyses for the six dependent variables are summarized in Tables 5, 6, and 7.

Table 5
Regression Findings for Negative Academic Consequences and Five or More Drinks In a Day over Past Two Weeks Dependent Variables

	Negative academic consequences						Five or more drinks per day in past two weeks					
	Fraternity & sorority students		Male fraternity students		Female sorority students		Fraternity & sorority students		Male fraternity students		Female sorority students	
Variable	*B*	*β*	*B*	*β*	*B*	*β*	*B*	*β*	*B*	*β*	*B*	*β*
Constant	.446*		.614**		.282		2.343**		1.191*		.914*	
Study Group	-.260**	-.095	-.214*	-.079	-.356**	-.138	-.271*	-.054	-.255	-.045	-.348*	-.083
Time Block												
3rd												
4th					.041	.011					-.042	-.007
5th	-.116	-.034	-.182	-.052			-.296*	-.045	-.536*	-.073		
6th	-.204*	-.054	-.176	-.044	-.093	-.027	-.299	-.041	-.469	-.055	-.102	-.018
7th	-.419**	-.079	-.467*	-.075	-.277*	-.057	-.413*	-.040	-.347	-.027	-.273	-.034
8th	-.241*	-.054	-.208	-.031	-.167	-.045	.277	-.032	-.757*	-.055	.004	.006
9th	-.099	-.021	.043	.009	-.130	-.026	-.027	-.003	-.148	-.016	.142	.018
10th	.079	.022	-.081	-.024	.343*	.089	.311*	.044	.053	.008	.689*	.011
11th	.43	.009	-.080	-.017	.166	.037	.038	.004	-.351	-.036	.424*	.058
Individual background factors												
Gender	.046	.018					-.834**	-.166				
White or Caucasian	.231	.050	.217*	.051	.325*	.064	.692**	.077	.780**	.089	.600*	.072
Age	-.021	-.020	-.033	-.031	.010	.007	.005	.002	.011	.005	-.001	.000
GPA	.064**	.083	.045*	.062	.079**	.088	.120**	.080	.184**	.121	.039	.027
Business major	.154*	.048	.259*	.082	.047	.014	.428**	.068	.635**	.097	.137	.025
Environmental factors												
Fraternity or sorority	.027	.009	.031	.011	-.016	-.004	.025	.004	.133	.023	-.038	-.005
At home with family	-.244	-.031	-.362*	-.050	-.095	-.011	-.540*	-.035	-.590	-.039	-.607	-.043
Substance free hall	-.138	-.025	-.296	-.042	-.050	-.010	-.471*	-.045	-.520	-.036	-.384*	-.049
Abstain from alcohol use	-.629*	-.131	-.421**	-.087	-.800**	-.162	1.671**	-.182	-1.87**	-.187	-1.45**	-.182
R	.224		.205		.254	.211	.326		.295		.249	
R^2	.050		.042		.065	.045	.106		.087		.062	

*$p < .05$. **$p < .000$.
[a] When value is blank, this variable not included in the model.

Table 6
Regression Findings for Negative Consequences Hangover/Mental Impact and Negative Sexual Consequences Dependent Variables

	Negative consequence hangover/mental impact						Negative sexual consequences					
	Fraternity & sorority students		Male fraternity students		Female sorority students		Fraternity & sorority students		Male fraternity students		Female sorority students	
Variable	*B*	*β*	*B*	*β*	*B*	*β*	*B*	*β*	*B*	*β*	*B*	*β*
Constant	.636**		.810**		.699**		.053		.064		-.043	
Study Group	-.351**	-.165	-.288**	-.138	-.422**	-.195	-.013	-.013	.015	.012	-.041	-.045
Time Block												
3rd												
4th					-.102	-.032	.049	.036			.013	.009
5th	-.021	.059	-.122	-.045					-.085	-.055		
6th	-.014	.068	-.074	-.024	.007	.002	.010	.007	-.089	-.051	.024	.019
7th	-.148	.083	-.186	-.039	-.148	-.036	-.022	-.010	-.142	-.052	.002	.001
8th	-.007	.070	-.112	-.022	-.027	-.009	-.010	-.006	-.080	-.028	-.036	-.028
9th	.060	.073	.045	.013	.011	.003	.097	.052	.047	.024	.070	.040
10th	.162*	.062	-.023	-.009	.309*	.095	.021	.015	-.038	-.026	.004	.003
11th	.076	.077	-.136	-.038	.171	.045	-.016	-.009	-.081	-.039	-.039	-.025
Individual background factors												
Gender	.084	.040					-.053*	-.051				
White or Caucasian	.277**	.073	.264*	.081	.327*	.076	.090*	.049	.070	.038	.116*	.065
Age	-.048*	-.055	-.066*	-.082	-.010	-.009	-.007	-.017	-.013	-.028	.000	.000
GPA	.026*	.041	.032*	.056	.022	.029	-.022**	.071	.024*	.076	.018*	.058
Business major	.146*	.055	.205*	.084	.118	.041	.082**	.064	.163**	.118	-.008	-.007
Environmental factors												
Fraternity or sorority	-.043	.017	.052	.024	.059	.016	.005	.004	.006**	.005	.018	.011
At home with family	-.231*	-.036	-.259	-.047	-.217	-.030	.016	.0053	.001	.000	.020	.007
Substance free hall	-.141*	-.032	-.220	-.041	-.065	-.016	.068	-.031	-.078	-.026	-.062	-.037
Abstain from alcohol use	-.823**	-.182	-.702**	-.189	-.940**	-.227	-.078	-.041	-.039	-.019	-.115*	-.066
R	.287		.290		.297		.154		.172		.134	
R^2	.082		.084		.088		.024		.029		.018	

*$p < .05$. **$p < .000$.
[a] When value is blank, this variable not included in the model.

Table 7
Regression Findings for Drinking and Driving and Negative Consequences Physical or Work Dependent Variables

	Drinking and driving						Negative Consequences Physical or Work					
	Fraternity & sorority students		Male fraternity students		Female sorority students		Fraternity & sorority students		Male fraternity students		Female sorority students	
Variable	*B*	*β*	*B*	*β*	*B*	*β*	*B*	*β*	*B*	*β*	*B*	*β*
Constant	.063		.023		-.071		.259*		.359*		.062	
Study Group	-.020	-.024	-.052	-.050	.011	.017	.022	.015	.058	.035	-.014	-.012
Time Block												
3rd												
4th	.026	.023			.001	.001	.106*	.056			-.015	-.008
5th			-.036	-.027					-.214*	-.099		
6th	-.004	-.003	-.032	-.040	.001	.001	.014	.007	-.182*	-.073	.002	.001
7th	-.013	-.007	-.104	-.044	.008	.006	-.055	-.019	-.248	-.065	-.073	-.032
8th	-.010	-.007	-.056	-.022	-.003	-.003	.041	.017	-.131	-.032	-.008	-.004
9th	.001	.001	-.025	-.014	-.017	-.013	.073	.028	-.094	-.033	.040	.017
10th	.025	.021	-.002	-.001	-.006	-.006	.116*	.059	-.058	-.027	.093	.052
11th	-.024	-.016	-.051	-.029	-.047	-.040	.072	.029	-.096	-.033	.031	.015
Individual background factors												
Gender	-.071**	-.083					-.090*	-.063				
White or Caucasian	.044	.029	.028	.017	.071*	.052	.065	.026	.059	.022	.086	.036
Age	.017*	.048	.020	.049	.010	.028	-.030*	-.051	-.046	-.071	-.007	-.012
GPA	.023**	.088	.028	.100	.017*	.072	.020*	.048	-.018	.040	.024*	.058
Business major	.009	.008	.035	.029	-.023	-.026	.042	.024	.129*	.066	-.051	-.032
Environmental factors												
Fraternity or sorority	-.052*	-.050	-.057*	-.053	-.039	-.033	.001	.001	.023	.013	-.044	-.021
At home with family	.095*	.037	.145*	.053	.018	.008	.073	.017	.069	.015	.057	.014
Substance free hall	-.048	-.027	-.092	-.035	-.033	-.026	-.013	-.004	-.014	-.003	-.071	-.003
Abstain from alcohol use	-.100**	-.062	-.120*	-.066	-.066*	-.051	-.118*	-.044	-.045	-.015	-.200**	-.087
R	.187		.187		.123		.125		.138		.134	
R^2	.035		.035		.015		.016		.019		.018	

*$p < .05$. **$p < .000$.
[a] When value is blank, this variable not included in the model.

The regression analyses using all fraternity and sorority affiliated members' responses (N=4,552) showed a negative association of the intervention to five of the six independent variables. This indicated that among fraternity and sorority affiliated members in the study, the intervention group had fewer negative consequences and heavy alcohol consuming days than the comparison group, when other variables in the model were controlled. The only variable that was not negatively associated with the intervention was negative physical or work consequences. The negative association between study groups was statistically significant for three of the six dependent variables including: (1) incidents of negative academic consequences; (2) incidents of hangover/mental impact; and (3) and incidents of having five or more drinks in a day over the past two weeks. The regression analysis confirmed the descriptive analysis that students participating in the AlcoholEdu intervention reported lower numbers of negative incidents, only some negative consequences, and fewer heavy alcohol use days than the comparison group of students who had not yet completed the curriculum at a similar time point in the 2003-04 academic year.

Examination of the standardized coefficients of independent variables in the regression models that examined all fraternity and sorority affiliated members in the study pointed to the strength of the study group variable. Specifically in relationship to negative consequences that are academic, negative consequences that are mental or hangover related and heavy alcohol use dependent variables. The strength of the study group variable in the models for academic negative consequences, hangover/mental impact, and incidents of drinking five or more drinks in a day over past two weeks indicated that for these three regression models the study group was one of the strongest independent variables. Among the other models (dependent variables), the study group variable was not as strong a relative independent predictor.

Results of the incidents of consuming 5 or more drinks a day over the past 2 weeks showed an overall mean of 2.343 for the intervention group and comparison group combined in the models that included the fourth through eleventh time blocks with the unstandardized coefficient predicting that the intervention group will have a .271 lower incidence of heavy consumption days than the comparison, when other independent variables were held constant. This finding extrapolated over a six-week period would suggest that intervention group participants would experience just under one less day of heavy drinking on average over that period. The unstandardized results associated with the negative academic consequences scale of the full model indicated an overall mean of .446 with the intervention group predicted to have a .260 lower mean incidence of negative academic consequences as measured on the scale. Similar results are found for the negative consequences hangover/mental impact where the overall mean was .636 and the intervention group is predicted to have a .351 lower incidents of hangover/mental impacts as measured on the scale in the model including time blocks 4 to 11. Other dependent variables had a less significant predicted decrease as seen in either the standardized or the unstandardized coefficients.

A second set of analyses were done to examine the use of AlcoholEdu with male or female students who were in fraternities and sororities. Results of gender specific sub-analyses compared men who reported taking AlcoholEdu as part of their fraternity experience to men who were affiliated with a fraternity and had not yet taken AlcoholEdu but who would eventually complete the program. A similar analysis was done for women affiliated with a sorority. This analysis pointed to three important results: (1) the study group variable was negatively associated with four of the six dependent variables for men and five for women; (2) Among men, the only model where the study group was statistically significant was for the dependent variables negative academic consequences and negative consequences that are mental or hangover related. Among women, there were three dependent variable models where the study group variable was a significant predictor. The dependent variables where the study group was significant for women included negative academic consequences, negative consequences that are mental or hangover related and five or more drinks in a day over the past two weeks; and (3) It is clear from examination of standardized coefficients for models in which the study group variable was statistically significant that the study group variable was a stronger predictor among women than among men.

A final element of the analysis of the regression models was the examination of overall model strength with variance predicted by each model. In all models, variance predicted in the dependent variable by the independent variables was small (R^2= .106 to .015). It can be noted that the strongest three predictive dependent variable models (R^2= .106 to .05) paralleled the models where the study group variable was a strong predictor of the dependent variable (i.e. negative academic consequences, hangover/mental impact and drinking 5 or more drinks in a day over the past 2 weeks).

Discussion

The intervention group participants experienced fewer negative consequences and incidents of heavy drinking than a comparison group as measured four to six weeks after program completion. The difference in negative events and drinking patterns was maintained throughout much of the school year even though across the seven months there was a steady increase in both incidents and amount of alcohol consumed for both groups. It is also notable that the intervention effect held for two negative consequences across gender, with incidents of heavy consumption not holding statistical significance for male fraternity members in the study.

The results speak first to the potential value of a brief, computer supported preventive intervention tailored to the interests and learning needs of fraternity and sorority affiliated members. Second, the longitudinal pattern of drinking and outcomes raises a series of questions including the timing of such an intervention within the academic year, the role of booster experiences designed to maintain the initial intervention effect, and how gender should be considered in intervention efforts. These issues would be best addressed in a prospective study with random assignment to the program and a delayed control group. Such a study design would build on the cross-sectional data reported here. Additionally a design might be instituted controlling for the possibility of students thinking they should provide socially acceptable responses.

The causal ordering of change cannot be ascertained from this cross-sectional analysis, but following the logic of alcohol use, it is likely that a decrease in episodic heavy drinking preceded the self-reported negative consequences. Findings here suggest that even small decreases in heavy episodic consumption may result in decreases in personal harm that are important for fraternal organizations looking to limit the impact of heavy alcohol use.

Among independent variables in the study, several important notes can be made about research participants. First, men consumed more and reported experiencing more negative consequences due to their alcohol use. Second, White or Caucasian individuals, who were about 90% of the study population, consumed more and reported experiencing more negative consequences from use. Those who hold a higher GPA reported lower consumption and negative consequences. Living conditions were also an important variable in this study, with men who lived in a fraternity facility reporting elevated consumption and negative consequences, while women living in a sorority facility reported lower consumption with less consistent negative consequence findings.

Implications for Policy and Practice

The potential of increasing technological capacity in alcohol education is that educational messages can be scalable for delivery and yet have interactive customizations that allow for individual educational experiences. While this vision of technology delivered health education has yet to be fully realized, this evaluation report summarizes the application of one curriculum that has been delivered to fraternity and sorority affiliated members and has moved toward individual customization. The evidence herein supports the continued efforts of fraternities and sororities to apply evolving technology as a tool in addressing short-term harm associated with heavy alcohol use.

This study has implications that inform policy and practice related to alcohol abuse prevention in fraternal organizations on college and university campuses. First, likely changes in consumption

and harm from the use of an online alcohol prevention curriculum are modest to small. Administrators working with fraternities and sororities should be aware that small measurable changes are a significant step forward in alcohol abuse prevention, but that expectations for the implementation of AlcoholEdu or like interventions should be calibrated with the evidence of likely change in behavior and related harm. Second, technology delivered alcohol education has potential for fulfilling the moral or legal duty a fraternal organization or campus has to provide a common level of knowledge related to alcohol abuse prevention. Technology can document program completion and comprehension through online knowledge tests to ensure a basic level of knowledge. Ensuring program completion that establishes a basic level of knowledge about alcohol use and abuse is an important effort in taking reasonable steps to ensure students have information to make responsible decisions with alcohol.

Beyond the reasonable duty a fraternal organization or campus has to address alcohol abuse, a common level of knowledge related to alcohol use creates a platform for building a multifaceted alcohol abuse prevention program. Results of this evaluation suggest that the use of AlcoholEdu, or like technology delivered alcohol education, should be utilized in conjunction with strategies that foster an environment that uses alcohol responsibility. Encouraging participation in community service activities, limits to alcohol access, brief screening and motivational interviewing with heavy alcohol users, and enhancing academic engagement are all strategies showing evidence or conceptual promise to foster responsible alcohol environments. AlcoholEdu should be seen as part of a multifaceted approach to prevent harm in fraternities and sororities related to alcohol use.

The results of this study support the continued use of online alcohol abuse prevention programs to affect modestly the harm seen to students from alcohol use within fraternal organizations. Specifically, the study points to reductions in academic negative consequences and hangovers/mental impacts associated with heavy alcohol use across gender, but with more limited findings of decreasing heavy consumption among men as compared to women. Implementation of alcohol abuse prevention efforts among fraternity men specifically should be multifaceted, on going and, optimally, student supported given the prevalence of use.

Findings from this study are important in providing evidence of the impact of technology as a tool in shifting the culture of alcohol abuse and related harm that is too often present in campus fraternities and sororities. Findings from this study are also important in showing that evaluation studies among and across fraternal organizations can be conducted. This study portrays how data can be used as a tool to illuminate program functioning. It also serves as an invitation to do additional research into the challenges that fraternity and sorority organizations face in ensuring their missions to engage students in service, leadership, and academic excellence.

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