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Academic Development of First-Year Living-Learning Program Students before and after Hurricanes Katrina and Rita of 2005

Abstract

Previous research suggests that the far-reaching impacts of hurricanes include the academic performance of students. In an examination of such impacts, we found a trend toward self-perceived decline in some performance indicators relative to students at peer universities. However, few longitudinal impacts were found, perhaps because of the sense of community offered by the living-learning program. These results may inform administrators and faculty of areas for emphasis in mitigating future impacts.

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Keywords

Hurricane Katrina, Hurricane Rita, living-learning program, educational assessment

Introduction

Hurricane Katrina's landfall in southeastern Louisiana on August 29, 2005 led to the most expensive and one of the deadliest natural disasters in U.S. history. Approximately three weeks later, Hurricane Rita washed ashore in southwestern Louisiana, causing more devastation. Area universities closed for a minimum of four class days. According to the Office of Budget and Planning at one large public university impacted by the storms, upon re-opening, that university admitted 2,387 undergraduate and 313 graduate students from severely affected institutions. Long-term impacts to area residents, including the first-year university students, remain important to understand.

The purpose of this research is to analyze the academic performance of first-year students before and after the hurricanes of 2005 at Louisiana State University (LSU), a campus that was peripheral to landfall but central to the impact of the storms. Comparisons will also be drawn for first-year students in living-learning communities (LLCs) *vs.* their peers residing on campus but not in LLCs (i.e., "traditional hall" students), their peers residing off campus, and first-year LLC students in peer universities. In addition to grade point average (GPA) data, the metrics for comparison consist of self-reported answers to survey questions that serve as indicators of three academic core outcomes: critical thinking ability, sense of civic and social responsibility, and communication skills. "Critical thinking ability" follows Facione, Facione, & Giancarlo's (2001) definition to include truth-seeking, open-mindedness, analyticity, systematicity, self-confidence, inquisitiveness, and maturity. "Sense of civic and social responsibility" is defined broadly to include the development of ethical decision-making skills in daily life, interpersonal relationships and skills, understanding of diversity (Longerbeam & Sedlacek, 2006), and policies of cyber-citizenship. "Communication skills" include written, spoken, visual, and technological media, and appropriate use and presentation of data when conveying a point.

Site

The study site is a learning-centered, research-extensive university located between the trajectories of Hurricanes Katrina and Rita (Figure 1). Total enrollment immediately prior to the storms was 30,564 students, with 80.4 percent of the students from within the state. A total of 22.6 percent were listed as permanent residents of the seven-parish, New Orleans standard metropolitan area, where Katrina's impact was most extensive, with another 8.1 percent of the students from the nine southwestern Louisiana parishes most affected by Rita (Office of Budget & Planning).

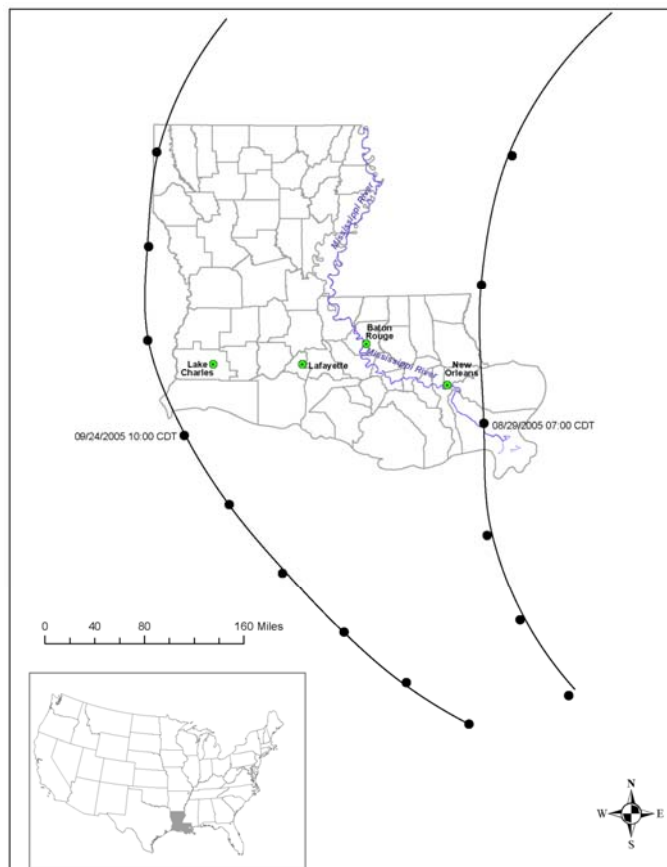


Figure 1. Tracks of Hurricanes Katrina and Rita, and cities mentioned in the text.

At the onset of the storms, three LLCs existed at the institution. The Honors College housed 542 students, with 430 (79.3 percent) being first-year students. Programs at the Honors College emphasized academic content, offering small seminar-style courses, frequent faculty colloquia, community service, study abroad, and undergraduate research. Residential College A was in its sixth year, housing 418 first-year students from the full spectrum of majors who were exposed to the first-year experience theme. Programs in Residential College A focused on personal growth, transition to the university and adulthood, and academic development, with some informal linkages between course sections in English, political science, and history. Residential College B was in its fourth year and home to 147 first-year students. Co-curricular programs in that hall emphasized technology as a tool for both academic and social development, with special course sections, primarily in English composition, that allowed technologically-savvy students to write on themes of interest to them. While no crisis management programs existed prior to the hurricanes, group discussions

and informal mentoring were common after the storms. None of the LLCs changed significantly in focus between 2004 and 2007. All LLC academic initiatives were incorporated in support of the three academic core outcomes.

Literature Review

Singular events in the last few years have been shown to have direct and perhaps irreversible impacts on academic, cognitive, and psychosocial development. For example, impacts of the 9/11 terrorist attack on decision making (Sacco, Galletto, & Blanzieri, 2003) and on medical students' performance (Streng, 2003) have been noted. The Texas A&M bonfire tragedy also affected student development (Gortner & Pennebaker, 2003). Several studies (*e.g.*, Crawford, Kahn, Gibson, Daniel, & Crane, 2008; Dicarolo, Delcarpio, & McClugage, 2008; Dicarolo et al., 2007; Krane et al., 2007) have documented Hurricane Katrina's impact on medical students in New Orleans. Ladd, Gill, & Marzalek (2007) noted that 55 percent of the 7100 student survey respondents at three New Orleans universities reported feeling depressed following Katrina, with 22 percent reporting symptoms that might be considered evidence of "clinical depression." Kishore et al. (2008) suggested that the impacts of Katrina on university students, faculty, and staff would require social and mental services for several years. Gill et al. (2006) reported similar magnitudes of Katrina's financial, physical, and emotional impacts on Mississippi State University students. Though analogous impacts of Rita are less documented in the literature, they are likely to be no less catastrophic to those affected.

Previous studies verify that LLCs enhance student development and engagement (*e.g.*, Inkelas & Weisman, 2003; Zhao & Kuh, 2004; Pasque & Murphy, 2005). For instance, LLC students succeed more than their peers in traditional residence halls (Pike, 1999), and they perceive a growth in their liberal arts education (Inkelas et al. 2006a). LLCs are especially helpful to first-generation students (Inkelas, Davis, Vogt, & Leonard, 2007), minority students (Johnson et al., 2007), and students at very small or very large institutions (Inkelas, Soldner, Longerbeam, & Brown-Leonard, 2008) in providing an added sense of belonging and attention by faculty and professional staff.

One might conclude though, that these academic benefits are not the direct result of LLC instruction or programs. Instead, as Pike, Schroeder, & Berry (1997) noted, LLCs may indirectly improve academic achievement by making the students feel more comfortable in their college/university environment. For the purposes of this paper, this indirect aid is extremely important as it might provide needed comfort in the aftermath of a disaster. Moreover, LLCs could conceivably do more than simply comfort people after disasters. It may be that they help students develop the thinking and communal skills to manage the disaster's aftermath by having a positive impact on all three of the academic core outcomes

considered here: improvement in critical thinking ability, sense of community and social responsibility, and communication skills.

The research suggests that LLCs have an impact on core academic outcomes. Pascarella & Terenzini (1991) found that LLCs enhanced critical thinking skills and cognitive development. More numerous studies demonstrate how LLCs develop students' communal skills. Rowan-Kenyon, Soldner, & Kurotsuchi-Inkelas (2007) found that students in civically-based LLCs exhibit a stronger sense of civic engagement than students in other LLCs and in traditional residence halls. Dong's (2005) work concurred with this, noting that LLCs helped increase levels of student volunteerism, community service, and civic empowerment. A more concrete example of these skills can be seen in Schroeder & Mable (1994). There, the researchers describe how LLCs develop civic leadership skills by helping them learn how to share personal experiences, to ask open-ended questions, and to rephrase what was said previously to reassure all participants that effective listening is taking place. These enhanced communication skills can even proliferate into higher-level faculty-student interactions (Cox & Orehovec, 2007).

Research Questions

Our research was designed to address the following questions:

1. To what extent did the students feel impacted by the storms?
2. Did the first-year LLC students report different levels of proficiency in critical thinking ability, sense of civic and social responsibility, and/or communication skills than their on-campus first-year peers in traditional halls and first-year LLC students at peer universities before and after the hurricanes of 2005?

Data and Methods

The researchers collected GPA data from entering students' high school years and their first university semester and year, provided by the university's Office of Budget and Planning. This was done for fall and continuing summer, full-time, degree-seeking, first-time, first-year students entering from 2000 to 2009.

In addition, a subset of the questions from the April 2004 and April 2007 National Survey of Living-Learning Programs (NSLLP, Inkelas, Vogt, Longerbeam, Owen, & Johnson, 2006b) was used as a performance indicator. Data collection was conducted by contacting students by electronic mail and directing them to an

Internet survey. (All data were collected and most electronic communication were sent to participants by Survey Sciences Group, LLC.) The survey asked students about how they perceived their achievement in the three academic core outcomes. All students living on campus were invited to participate, and only aggregate results by building/program were available from both surveys. Of the three LLCs, only Honors College contained a significant number of non-first-year undergraduates, 32.0 percent of the 2004 respondents, compared with 7.7 percent and 0.0 percent in Residential Colleges A and B, respectively, and 24.0 percent in 2007, compared with 6.0 percent and 4.0 percent, respectively. Although the residential colleges did not accept upperclassmen, a few first-year students identified themselves as upperclassmen on the survey because of credit received before entering the university.

A total of five questions that appeared on both the 2004 and 2007 NSLLP were deemed to indicate the degree to which critical thinking skills were affected in the LLCs, versus those university students living in traditional halls. Two questions on these surveys measure how much campus initiatives affect students' sense of civic and social responsibility. The five "communication skills" questions were subdivided into two categories. Two questions represent the quality and quantity of interactions with faculty (one for course-related interaction and the other for mentorship). Three other questions indicate the success of communication with peers. Caution should be exercised in the interpretation of results for three reasons: (1) Some questions were not included on both surveys; (2) the Honors College includes upperclassmen while Residential Colleges A and B have few or no Honors students; and (3) cross-cultural differences in the degree of self-reported progress could exist across campuses.

Statistical t-test comparisons were made between the distribution of results of the LLC students and those at LLCs in research-extensive peer institutions. In 2004, the peer institutions were considered to be those that were "Research Extensive" with 1 to 5 LLCs on campus. A total of 2,574 LLC students and 2,855 traditional hall students from seven such peer universities responded to the 2004 survey. By 2007, the definition of peer institutions changed slightly in the NSLLP to "Research University very high; < 10 LLCs". By that definition, 3,754 LLC students and 3,244 traditional hall students at 13 peer universities participated. Any divergence responses between the affected university and those of peer schools could possibly be attributed to the hurricanes of 2005, because no singular events of the magnitude of the hurricanes affected the student populations at the peer institutions.

Finally, the 2007 NSLLP Longitudinal Follow-up Survey (Inkelas, Daver, Vogt, & Leonard, 2007) was used to track the responses for the *same* students across the 2004 to 2007 period (i.e., from their first to fourth year at the university). A total of 50 students in traditional halls and 17 in LLCs participated in this survey. Because of the low number of LLC respondents, statistical results for this survey are not reported for LLC students.

Results

The Perceived Role of the Hurricanes

The first research question involved the students' perception of the extent to which the hurricanes of 2005 affected them personally. The indicator was the customized question in the 2007 and longitudinal surveys, "*To what extent did Hurricanes Katrina and/or Rita affect your academic performance?*" Table 1 suggests that the LLC students are less likely than traditional hall students to attribute academic difficulties to the storms. A total of 16.4 percent of LLC students reported that their academic performance was affected "to some degree" or "significantly" by the storms, compared with 23.1 percent for traditional hall students. It is unlikely that LLC students are less affected because they did not come from hurricane-affected regions, because they are nearly as likely to be in-state residents. It seems plausible that the strength of community in the LLCs provided more comfort during the crisis than the non-LLC environments. Because of the low number of respondents, results from this customized question in the longitudinal survey were not segregated by LLC *vs.* traditional hall students (Table 1).

But again, the majority of the students in the longitudinal survey reported being affected at least slightly. Therefore, academic development over the period, as represented by the performance indicators, occurred despite the storms. The six-year graduation rate of students entering Residential College A (65.3%) and Residential College B (64.3%) in August 2005 exceeded that for the institution as a whole (59.9%), suggesting that the living-learning experience may have assisted in their long-term academic development.

Table 1
Responses to the 2007 and Longitudinal Customized Question, “To what extent did Hurricanes Katrina and/or Rita affect your academic performance?”

	LLC	Traditional Hall	Total
Not at all (2007)	155	224	379
	58.9%	46.2%	50.7%
Not at all (longitudinal)	-	-	24
			35.8%
Slightly (2007)	65	149	214
	24.7%	30.7%	28.6%
Slightly (longitudinal)	-	-	23
			34.3%
To some degree (2007)	27	53	80
	10.3%	10.9%	10.7%
To some degree (longitudinal)	-	-	16
			23.9%
Significantly (2007)	16	59	75
	6.1%	12.2%	10.0%
Significantly (longitudinal)	-	-	4
			6.0%
Total respondents (2007)	263	485	748
Total respondents (longitudinal)	17	50	67

Critical Thinking Ability, Sense of Civic and Social Responsibility, and Communication Skills in LLC students

The second research question focused on whether first-year LLC students reported different levels of proficiency in critical thinking ability, sense of civic and social responsibility, and/or communication skills than their on-campus first-year peers in traditional halls and first-year LLC students at peer universities before and after the hurricanes of 2005. Despite the cautions that must be exercised in drawing conclusions from self-reported surveys (Pascarella, 2001), the NSLLP results provide some evidence that in 2004 the LLC students felt more satisfied in their critical thinking skills than first-year students in LLCs at peer

institutions. Scores on all five performance indicators exceeded those of LLC students at peer schools. However, only one of these differences—growth in personal philosophy—was statistically significant (Table 2). Although the institution’s traditional hall students scored similarly to its LLC students, the LLC students did score significantly higher on one performance indicator, critical thinking/analysis abilities (Table 2). However, by 2007 there were no statistically significant differences in performance indicators for critical thinking (Table 2).

Table 2
Results of National Study of Living-Learning Programs (NSLLP) on Performance Indicators of Critical Thinking Skills

Performance Indicator	2004			2007		
	LLC	Traditional	Peer LLC	LLC	Traditional	Peer LLC
Critical thinking/analysis abilities	2.93 ¹	2.75	2.90	2.89	2.83	2.92
Application of knowledge abilities	3.15	3.10	3.10	3.12	3.07	3.11
Growth in cognitive complexity	2.86	2.90	2.79	2.91	2.95	2.86
Growth in liberal learning	2.60	2.62	2.53	2.77	2.76	2.70
Growth in personal philosophy	2.92 ¹	2.96	2.82	2.98	2.98	2.90

Measures LLC students vs. traditional hall students at LSU vs. LLC students at a peer university, using a scale of 1 to 4. Source: National Study of Living-Learning Programs

¹Significantly above the lower of the two comparison groups ($p < 0.05$).

Some evidence also exists that the LLC students felt a dulled sense of community and social responsibility between 2004 and 2007. In 2004, the students scored significantly higher on these measures than did their peers in on-campus traditional halls and students at LLCs at peer universities (Table 3).

But, by 2007 these differences either disappeared or were not measured. This result is particularly disappointing in the wake of opportunities for community involvement for rebuilding after the storms. The extent to which these results are attributable to the extraordinary psychological impact of the storms vs. any institution’s capacity to promote service on this scale is debatable, but what we don’t see is an increase in students’ perceptions about their critical core outcomes.

Table 3
Results of NSLLP on Performance Indicators of Community and Social Responsibility

Performance Indicator	2004			2007		
	LLC	Traditional	Peer LLC	LLC	Traditional	Peer LLC
Sense of civic engagement	3.71 ¹	3.62	3.61	2.92	2.87	2.92
Sense of civic empowerment ²	4.12 ¹	4.05	3.99	NA	NA	NA

Measures LLC students vs. traditional hall students at LSU vs. LLC students at a peer university, using a scale of 1 to 4. Source: National Study of Living-Learning Programs

¹Significantly above both comparison groups ($p < 0.05$).

Communication skills also declined between 2004 and 2007. Scores for the university's LLC students were significantly higher than for their peers in on-campus traditional halls in three of the five indicators in 2004: communication with peers about academic and socio-cultural issues, and faculty mentorship. But by 2007, they were only significantly higher in one of the five indicators. Likewise, the 2004 scores for faculty mentorship and academic-peer communication significantly exceeded those of students at peer university LLCs, but by 2007, these differences were no longer significant (Table 4).

The finding that in 2007 the university LLC students reported significantly *less* course-related faculty interaction than the students in the other two groups raises considerable concern. In addition to the possibility that the storms had an impact on LLC students' ability to interact with faculty, it is feasible that (1) the LLC students underestimated the number of interactions with faculty; (2) were unclear about whether a program participant was a faculty member; or (3) peer interaction on course-related matters came at the expense of faculty interaction. Some evidence does support (1) and (2), as results from a customizable question on the 2007 NSLLP revealed that LLC students were more likely than their traditional hall peers to interact with faculty (Table 5).

Table 4
Results of NSLLP on Performance Indicators of Communication Skills

Performance Indicator	2004			2007		
	LLC	Traditional	Peer LLC	LLC	Traditional	Peer LLC
Discussed academic/career issues with peers	3.37 ²	3.19	3.28	3.32 ¹	3.18	3.27
Discussed socio-cultural issues with peers	2.53 ¹	2.30	2.58	2.46	2.35	2.54
Course-related faculty interaction	2.12	2.12	2.15	1.80 ³	1.90	1.89
Faculty mentorship	1.39 ²	1.28	1.33	1.39	1.41	1.45
Positive peer diversity interactions	2.07	2.07	2.16	2.31	2.31	2.50

Measures LLC students vs. traditional hall students at LSU vs. LLC students at a peer university, using a scale of 1 to 4. Source: National Study of Living-Learning Programs

¹Significantly above the lower of the two comparison groups (p <0.05).

²Significantly above both comparison groups (p <0.05).

³Significantly below both comparison groups (p <0.05).

Table 5
Responses to the 2007 Customized Question, “In what ways have you interacted with faculty in your residence hall environment (select all that apply).”

	LLC	Traditional Hall	Total
Office hours in the residence halls	61 23.74%	42 8.88%	103 14.11%
Program offered by the faculty	59 22.96%	70 14.80%	129 17.67%
Program presented by the faculty	57 22.18%	66 13.95%	123 16.85%
Informal meeting/gathering	102 29.69%	151 31.92%	253 34.66%
Study group	42 16.34%	20 4.23%	62 8.49%
Other (specify)	6 2.33%	21 4.44%	27 3.70%
None	102 39.69%	259 54.79%	361 49.45%
Total	257	473	730

Discussion

These findings may be useful to Student Life and Academic Affairs professionals, as an improved understanding of the effects of disasters on college students has become a more widely recognized critical need. However, caution should be exercised in the interpretation of results for several reasons. First, the use of GPA data as an indicator of academic performance in general, is not without its difficulties (Noble & Sawyer, 2002). Moreover, in this particular case, it is difficult to isolate the storms' impact on academic performance using only GPA data, for several reasons: (1) In some cases, resulting negative behavior may have not been demonstrated for months after the actual storms occurred; (2) the university offered programs and services to assist with coping, and these may have helped students academically; (3) students' resilience may have allowed them to compartmentalize issues easily, especially if they have short-term goals; and (4) it is possible that the old adage "misery loves company" could have been helpful to these students academically. The provision of special programs and services, along with the opportunity to interact with other students in similar situations, may have helped them maintain focus for the short term. Because the students are all likely to have felt "deprived" in one way or another, the absence of a "relative deprivation effect" may have helped them to cope with the disasters. Additional analyses are necessary to confirm the hurricanes' impact on the students.

Another limitation to the interpretation of results is that the extent to which particular interventions aided in the students' coping mechanisms for non-academic stresses remains unclear. The faculty and professional staff assigned to the LLCs clearly spent additional time with the students—one faculty member opened her home for nearly a month to a student participant's hurricane-displaced family—but to what extent did these efforts help? While individual co-curricular programs in the hall and other campus services and programs outside the hall were undoubtedly beneficial to the students' academic, social, emotional, and cognitive adjustment, it seems, anecdotally at least, that the mere presence of a support structure in the community may have played a stronger role than any particular co-curricular program or service. Further research is needed to quantify the relative importance of the community vis-à-vis particular programs within and outside the community.

Lessons to be learned by the host institution and at institutions that may serve as future hosts of student disaster victims are many. First, disasters can academically and/or affectively impact students, or at least the students will report such. The university's aid is probably helpful, especially aid that places students in an environment with supportive staff and peers. The LLCs are good examples of this kind of support. Universities are doubtlessly aware that many students may

have their own support structure and do not need university assistance. However, some students may lack support, especially entering freshmen who have yet to develop social networks and capital in their new environments. These circumstances place them at more significant risk in the event of a disaster. This provides a good reason why some entering students should consider living on campus in Residential College/LLC-like housing.

Summary/Conclusions

In 2005, Hurricanes Katrina and Rita disrupted life substantially in the affected region. This research analyzed GPA and self-reported survey data for students living on campus at LSU to assess the degree to which academic development of full-time, degree-seeking, first-year students may have been impacted by the hurricanes. Longitudinal data were also used to track long-term impacts of the storms on those on-campus, first year students' individual development. Results identify no obvious relationship between GPA and the storms, but there is some suggestion of a potential impact among in-state students and among university honors college students.

Over the 2004-2007 period, incoming LLC students' self-perceived academic development appeared to suffer relative to LLC students at peer institutions that were not affected by hurricanes. However, longitudinal analysis revealed no evidence of significant long-term negative impacts on individual development except in their sense of community and social responsibility. More direct cause-effect relationships between the storms and the academic performance should be sought.

Our results invite hypotheses that should be tested in future research on the academic response to natural or human-induced disasters. Because it is unrealistic to expect that there were no impacts on the students, future research should investigate the reason for the lack of a stronger GPA decline during the "hurricane semester" of fall 2005. Such research should also investigate the reasons for the steeper decline in GPA for honors students than for traditional hall students. One possible explanation for this might be that gifted students are more emotionally sensitive to hardship. Proponents (e.g. Silverman, 2000) of this theory have noted that gifted students' schoolwork can suffer significantly when they are distressed. Perhaps Katrina/Rita's impact coupled with the Honors' college's already challenging workload caused such distress, which in turn disproportionately affected the gifted students' GPAs.

Nevertheless, it is also possible that being in school with peers in the same situation may have created a latent sense of normalcy and community for students to the extent that academics became an "escape". This refuge might not even be reflected by the students' own perceptions, but the distraction may have severely affected the highest-achieving students. Perhaps the student interventions by the

host university, including providing needs as basic as food while electricity was unavailable, helped some students more than they realized. Future research should also assess more directly the degree to which university-sponsored intervention programs, including the LLCs, mitigate academic impacts of natural disasters, community tragedies, and personal difficulties.

Our results also suggest that students (especially those living on campus) may have actually benefitted from their housing arrangement relative to some other citizens in the area, who may have been displaced far from their homes and/or housed in uncomfortable temporary arrangements. Similarly, future research should also compare academic performance for those student disaster victims who remained at nearby universities vs. those who were displaced farther away, perhaps lost in a crowd of unaffected students. Anecdotal evidence suggests increased unity and surprising success among university athletic teams from the affected area who were required to practice and compete at distant locations. For example, the University of New Orleans baseball team completed a 30-28 season in 2006, even after having had fall practices severely disrupted. The team participated in the regional playoffs in both 2007 and 2008.

Regardless, this research has shown that assessing the 2005 hurricanes' academic impacts is complicated, involving many variables affecting a varied group of people. The resulting cathartic experience for both the displaced students and the students only indirectly affected by the disasters may have enhanced retention and graduation rates. The fall semester of 2005 undoubtedly enriched the student and faculty experience by demonstrating that coping with unexpected tragedies and moving forward is indeed a part of the educational experience.

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