7
Innovation Climate

The world leaders in innovation and creativity will also be world leaders in everything else.
—Harold R. McAlindon

Innovation is a defining characteristic of successful organizations and successful leaders, and is therefore important to our study of IT leadership. This chapter focuses on campus central IT organizations and investigates how those survey respondents working in central IT organizations (1,253 senior-most IT leaders and other IT professionals) view their organizational support for innovation. We address the following questions:

- How do respondents working in central IT units perceive their support for innovation?
- How do institution types differ in their central IT organizations' innovation climate?
- How does leadership style relate to innovation climate in central IT units?
- What is the impact of central IT unit innovation climate on perceived IT effectiveness?

Key Findings

- Respondents do not perceive higher education's central IT organizations, on the whole, as environments that strongly support innovation.
- Respondents from doctoral institutions report lower support for innovation in their central IT organizations.
- Senior-most IT leaders, older respondents, and respondents with a high transformational leadership style report higher central IT unit innovation climates.
- Respondents who report high innovation climates for their central IT organizations agree more strongly than others that IT is effective on several dimensions.

Innovation Climate in Higher Education IT

What is innovation? We might define it as the source for new or improved services or products. However, W. Arthur Porter better captured the process of innovation when he said that "the innovate point is the pivotal moment when talented and motivated people seek the opportunity to act on their ideas and dreams." Information technology is a natural locus for innovation in academic institutions because IT initiatives are in and of themselves vehicles for innovation. For example, installing an enterprise resource planning system can potentially generate institution-wide innovations in processes as well as product. A climate open to innovation depends strongly on leadership, for it is the leadership that coordinates and implements innovation. This relationship between leadership and innovation motivated our desire to understand more about the innovation climate in higher education IT organizations and to allocate a portion of our survey to this question.

To measure innovation climate, we used a multifactor survey instrument[1] that asks respondents 25 questions about activities

related to innovation in their institution's central IT organization. These questions use a Likert scale (1 = not at all, 2 = once in a while, 3 = sometimes, 4 = fairly often, and 5 = frequently, if not always). We then mapped the statements into the nine innovation characteristics associated with promoting or supporting innovation in organizations (described in Table 7-1).[2] On the basis of these ratings, we created a score for each of the nine characteristics for each respondent, then combined these nine scores to produce an aggregate central IT organization "support for innovation" score for each survey respondent.

Table 7-1. Support for Innovation Characteristics

Characteristic	Description
Risk-Taking	Employees are challenged and rewarded for coming up with novel ways of doing things and are encouraged to learn from mistakes. Standard operating procedures are guides, not rules, for making decisions.
Rewards	People receive tangible and intangible rewards for trying out new ideas. Employees receive top-level recognition for their contributions so that they feel a sense of pride and achievement in their work.
Empowering	Employees are trusted. They are encouraged to use professional judgment in making nonroutine decisions. They are encouraged to learn and take part regularly in educational events on and off the job.
Objective Measurements	Employees have valid and objectively defined standards that measure their work. These standards derive from the organization's mission and assessments of the organization's main programs, products, and services.
Feedback	The organization has well-established communication with people inside and outside the organization. It uses information to monitor the quality of service and make corrections before problems escalate. Employees know their clients directly.
Turbulence	Organizations are flexible enough to respond to problems. They communicate with employees and clients to enlist support in solving problems.
Interdependence	Although the organization has checks and balances to control waste, fraud, or abuse, these controls do not interfere with a seamless flow of work. Managers defer their own interests to the overall mission of the organization.
Decentralization	There is little difference in social status between managers and employees. The organization absorbs a variety of ideas from all personnel to find creative solutions and to boost commitment to reaching goals.
Cosmopolitan	In making decisions, managers focus on the big picture of client needs. They encourage the influx of new ideas by analyzing feedback and soliciting the skills of outsiders. They enjoy learning about organizations that use best practices.

Overall IT Innovation Climate Profile

The first major finding from the data is that respondents don't perceive higher education central IT organizations, on the whole, as very supportive of innovation. Indeed, as Figure 7-1 shows, nearly two-thirds (63.6 percent) of respondents had "support for innovation" scores on the low-average or low end of the innovation climate scale.

What is surprising about this finding is that prior research indicates that environments with higher transformational leadership behaviors display higher support for innovation. This leads to a higher education anomaly: while the IT leaders surveyed showed effective leadership profiles, and, while they think of higher education as having a mission of innovation, they seem to be working in IT climates they perceive as not very conducive to innovation. This suggests that areas exist where higher education IT leadership can and should take action to improve the climate for innovation. It also suggests that other factors, whether institutional or individual, might be inhibiting the innovation climate in these central IT organizations. In fact, some respondents talked about difficulties in bringing about innovation. One respondent summarized the problem: "The biggest barriers to innovation include personal and professional risks associated with promoting change, the amount of effort required to implement and sustain change or innovation, organizational silos and fiefdoms, and ambivalence about the importance of and commitment to administrative excellence."

We now turn to the actual data to understand this low level of support for innovation in central IT organizations and examine the nine characteristics of innovation support more closely. Figure 7-2 illustrates the mean values for each characteristic and the range of responses within one standard deviation of the mean. The figure shows that the characteristics of Turbulence, Feedback, and Rewards are the key areas contributing to the lower overall innovation climate scores.

The common element in the Turbulence and Feedback characteristics is communication. Turbulence refers to communication for solving problems, and Feedback refers to the well-established communication links with people inside and outside the organization. This suggests that gaps in communication

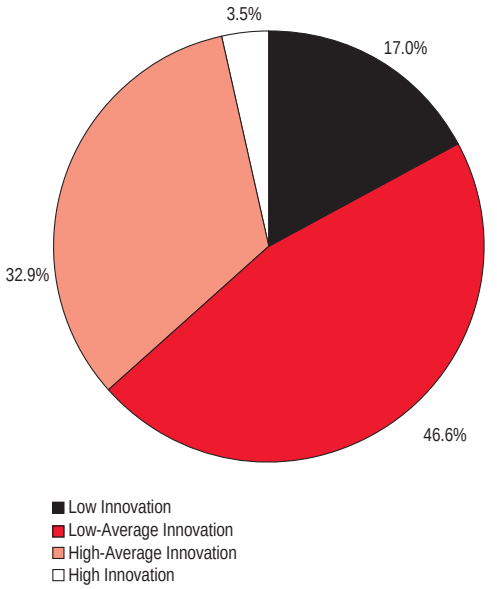

Figure 7-1. Central IT Units' Innovation Climate Scores

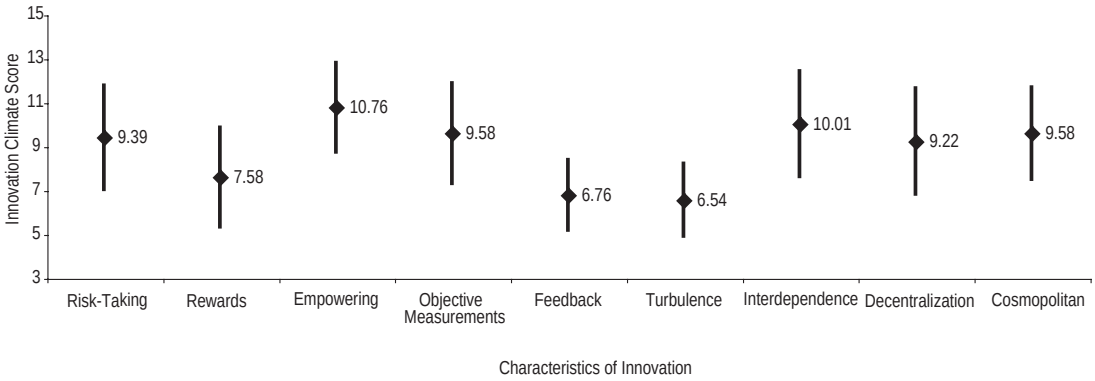

Figure 7-2. Innovation Climate Characteristics *(Range Is Mean Plus/ Minus One Standard Deviation)*

processes within the IT organization, between the IT organization and the institution, or with constituents outside the institution might inhibit an innovative climate. This may be due partly to higher education's inherent nature as insular and silo based, with less than effective cross-organizational communications.

The University of California at Davis's John Bruno acknowledged the importance of communication when he said, "I had some management experience previously, but not dealing with a 300-person staff. One of the biggest lessons I had to learn was how to communicate. By this I mean the sequence of communication steps to ensure that people are informed in an orderly and consistent manner, and that you have buy-in at all levels. This makes all the difference in the world."

Low Rewards scores imply that individuals don't receive sufficient rewards (tangible or intangible) or recognition for trying out new ideas—another familiar characteristic of higher education. The extent to which the most tangible reward—pay—can be manipulated is often limited, especially in tight budgetary times. Our interviewees recognize this and have developed numerous creative ways to compensate for this reality. For example, they pointed to public recognition for exceptional performance. Joyce Williams-Green, associate provost for information resources/CIO at Winston-Salem State University, likes to present outstanding employee accomplishments as "success stories" to other employees. On the flip side, she said it's also "important to teach your staff that it is okay to make a mistake. If they don't make a mistake, they are not doing their jobs. Make a mistake, acknowledge the mistake, resolve it, and go on."

Higher education IT leaders seek to improve communication and rewards, both important to the innovation climate. Our findings suggest, however, that much more can be done with respect to rethinking, monitoring, and adjusting our communication and reward models.

It is also instructive to look at what we are doing well. The Empowerment innovation climate characteristic scored high, and this topic bubbled up frequently in interviews with IT leaders. Case Western's Lev Gonick said, "I characterize it as a balance between challenge and support. All of my direct reports are significantly challenged, and we then put resources behind those challenges in the form of support. I also make sure that they understand my willingness to engage, and to try to remove some of the hurdles inhibiting success."

Institution Type and Carnegie Class

Although we found little difference between public and private institutions,

differences did emerge between Carnegie classifications, as shown in Figure 7-3. Respondents from doctoral institutions' central IT units reported significantly lower innovation climates than respondents from other institution types, suggesting that leaders in research institutions may face additional challenges and barriers to creating environments that support IT innovation. Research universities face increased complexity, a more challenging regulatory environment, and a more elitist culture, and these universities are generally large. In fact, we also found that respondents from larger institutions reported lower innovation climates in their IT organizations than did respondents from smaller institutions.

Among the nine innovation climate characteristics, research institution respondents indicated having more support in terms of creating Rewards but significantly less support in all other categories. One explanation is that respondents perceive rewards for pursuing innovation as higher in research institutions, which generally offer more room for advancement and varied work experience than smaller institutions do. Respondents from institutions with larger IT units also rated their IT environments as having higher support for rewards than did respondents from smaller units.

Innovation Climate and Respondent Characteristics

Do respondents' particular characteristics influence how they rate their IT innovation climate? In fact, the findings show differences related to CIO aspirations, academic background, and mentorship. Twenty-nine percent of those who aspire to a CIO position rated their central IT unit's support for innovation as high or high average, compared with 21 percent of those without such aspirations. Individuals with an academic background were also more likely to perceive higher innovation support: nearly 66 percent of respondents with an academic appointment rated their IT organization as having a strong innovation climate, compared with 34 percent of those without an academic appointment. Those with academic appointments were more likely to perceive an environment specifically supportive of taking risks and rewarding innovation.

Finally, the importance of mentoring surfaces again in the data: 43 percent of respondents who had a mentor perceived high or high-average innovation climates,

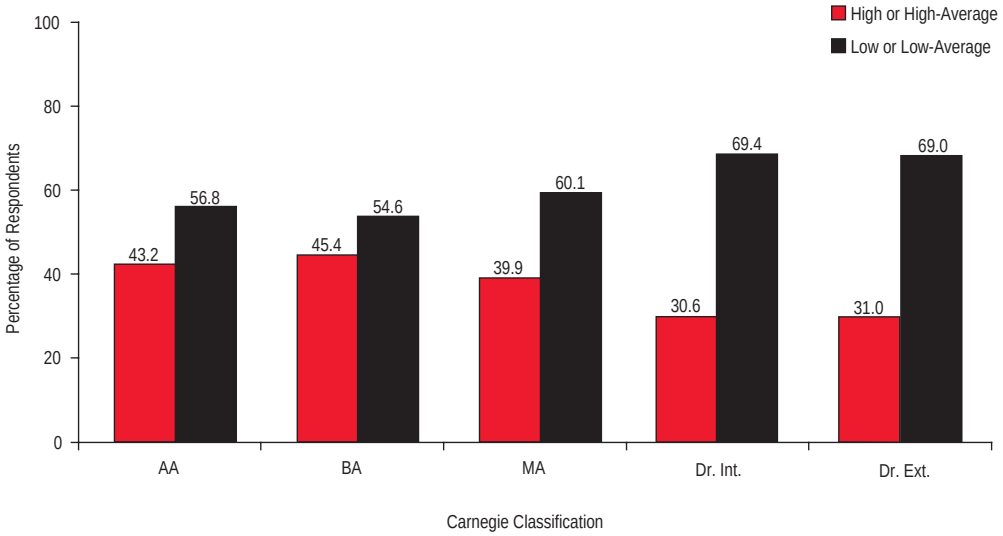

Figure 7-3. Innovation Climate Scores, by Carnegie Class

compared with only 31 percent of those without mentors. Perhaps a mentor's personal attention provides IT personnel with more opportunities to learn how to navigate and take advantage of the IT environment, and therefore they perceive a stronger innovation climate. Lasell College's Deborah Gelch, a firm believer in mentoring, said, "I benefited so much from mentoring, and so I spend a lot of time mentoring those who report directly to me and other professionals in my unit. I'm thrilled. People have done it for me, and I am happy to help other people as well."

Leadership Matters—Again

It is leadership that coordinates and implements innovation, and the literature on innovation reports a distinct relationship between leadership style and innovation. Specifically, leaders foster innovation by creating a climate open to creativity and supportive of differences, and also supportive of risk-taking.[3] We look first at how respondents' perceptions of innovation climate relate to leadership style. Prior research found that a transformational leadership style plays a positive role in generating a positive innovation climate. The ECAR study data strongly support this literature. Figure 7-4 shows that IT leaders with higher transformational leadership behaviors perceive stronger support for innovation in their IT organizations. In fact, no respondents with a low transformational leadership style score perceived their IT organizations as having a high innovation score.[4]

We also found that a respondent's role in IT leadership at the institution is key (Figure 7-5). Once again, whether or not a respondent was the senior-most IT leader proved a strong indicator of how he or she perceived the institution's innovation climate. Of senior-most IT leaders, 37 percent rated their central IT units as having high-average to high innovation climate scores, compared with only 27 percent of other IT professionals. Since most of our senior-most IT leader respondents are directly responsible for, and control, one or more of the central IT organizations on their campuses, they likely have greater freedom themselves to innovate and to create an IT working environment supporting innovation. In fact, we see this pattern of the senior-most IT leader having a more positive view of IT (both in the central IT organization and at the institution in general) again in a later chapter when we look at respondents' perceptions about IT effectiveness.

What can we learn from these findings about how leadership style and role relate

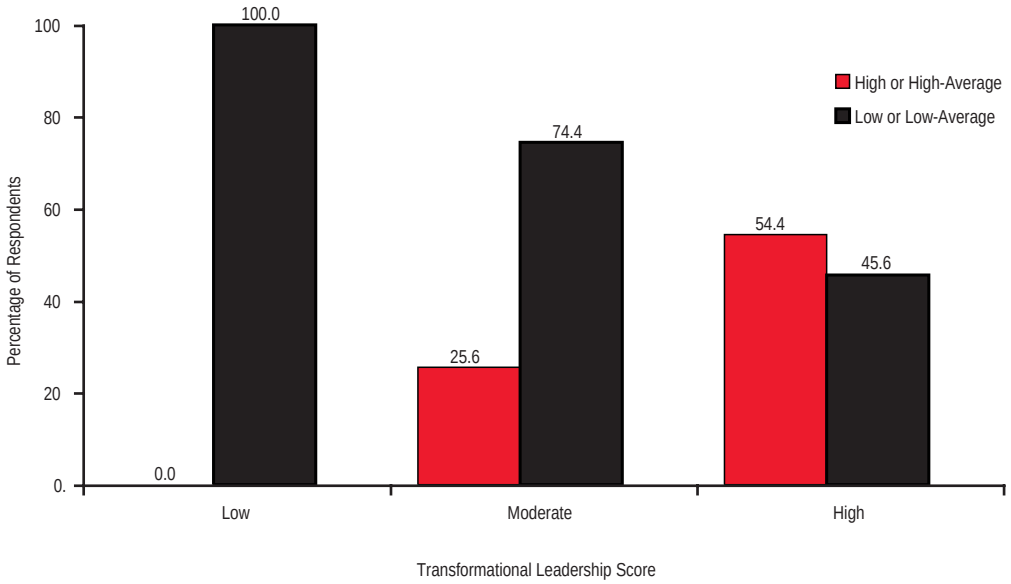

Figure 7-4. Innovation Climate Scores, by Transformational Leadership Style

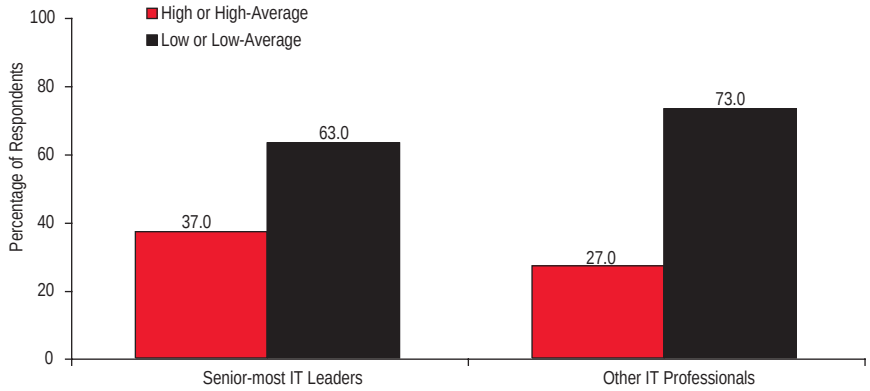

Figure 7-5. Innovation Climate Scores, by Role

to the central IT unit innovation climate? We once again see the Turbulence, Feedback, and Rewards innovation characteristics as areas for improvement. Role—senior-most IT leader versus other IT professional—most influences Turbulence (flexibility and communication for effective problem solving) and Feedback (established communication structures) scores. Again, these characteristics' common element is communication, suggesting that closer examination of communication processes designed by senior-most IT leaders and practiced by the leaders themselves might lead to new or improved communications and, subsequently, better innovation climates. The Rewards characteristic is most influenced by the transactional rather than transformational leadership style, which indicates that the lower Reward scores relate more closely to tangible than intangible aspects of recognition for employees.

This analysis provides some insight into how we might target improvements in reward and communication structures to improve innovation support. Given most institutions' budgetary constraints, it may be more financially feasible (although difficult culturally) to address communication issues. Nevertheless, even under such conditions, finding creative solutions to increasing tangible rewards could have high payoffs.

The Value of Support for Innovation

Our discussion so far has emphasized that overall perceived support for innovation in higher education central IT units is relatively low, with only one-third (36.4 percent) of respondents reporting innovation climate scores in the high-average to high range. But should we care? What is the value of high innovation support in IT organizations? To begin answering this question, we look more closely at respondents who reported that they work in the more innovative climates. Specifically, do they see their IT organizations and institutions as more effective in deploying IT? We asked respondents to rate their level of agreement or disagreement with 41 statements about IT environment effectiveness using a Likert scale (1 = strongly disagree to 5 = strongly agree). We analyzed respondent ratings in the context of how they viewed the central IT unit innovation climate (Tables 7-2 and 7-3).

The results are striking. Indeed, respondents who agree that central IT has a climate conducive to innovation also perceive higher levels of IT effectiveness in both the central IT unit and the institution as a whole. By contrast, the percentage of respondents agreeing with these IT effectiveness statements drops sharply for those who rate their

Table 7-2. Relationship Between Perceptions of Central IT Effectiveness and Innovation Climate Scores

	IT Unit Innovation Climate Score (Percentage of Respondents Who Agree or Strongly Agree)			
Central IT Organization Effectiveness Component	**High**	**High-Average**	**Low-Average**	**Low**
IT organization fosters responsible experimentation and innovation	100.0	93.8	73.7	35.8
IT organization has staff members who are well trained in technologies required to do their jobs	100.0	89.3	73.9	41.5
IT unit maintains excellent relationships with other units across campus	97.7	84.4	60.9	18.6
IT organization is increasingly influential	97.7	91.1	70.7	43.5
IT organization has strong project management and process management skills	95.4	76.0	47.3	17.0
IT organization makes organizational and personnel changes to accommodate deployment of new technologies	95.3	84.5	56.2	25.4
IT organization actively communicates IT architecture to campus	93.1	74.0	49.8	25.2
IT organization is final authority on campus-wide IT infrastructure decisions	93.0	80.9	67.1	53.4
IT organization sets IT architecture and standards	93.0	86.1	65.7	53.2

Table 7-3. Relationship Between Perceptions of Institutional IT Effectiveness and Innovation Climate Scores

	IT Unit Innovation Climate Score (Percentage of Respondents Who Agree or Strongly Agree)			
Institutional IT Effectiveness Component	**High**	**High-Average**	**Low-Average**	**Low**
Institution's IT infrastructure is recognized as an important institution-wide asset	100.0	89.3	76.4	49.7
Institution's IT infrastructure easily accommodates new and emerging technologies	97.7	81.4	56.7	31.0
There is an effective management structure for overseeing IT activities	95.4	86.2	60.6	15.4
Leadership of the institution understands the value of IT	93.0	83.0	67.9	47.0
IT initiatives often result in sustainable and positive cultural change	93.0	77.9	52.0	25.0
IT is a prominent element in institution-wide strategic plans	93.0	73.7	65.3	45.8
Institution has a reputation for being forward-thinking in the use of IT	90.7	75.2	54.1	29.9
IT initiatives challenge long-standing procedures and processes	88.4	85.6	65.7	47.5

central IT organization's innovation climate as low. From these data, we can make some general observations.

IT General Management

Respondents reporting high or high-average IT innovation climates in their central IT units view some dimensions of IT general management more positively than do other IT professionals. They agree more often that the overall IT management structure is effective, and they more often view the central IT organization as having strong project and process management skills and excellent relationships with other campus units. In addition, they overwhelmingly agree that the central IT organization has staff members well trained in technology and makes personnel changes necessary to embrace new technologies.

Organizational Change

Respondents who report that they work in institutions where the central IT unit has a high or high-average IT innovation climate perceive more organizational change than do other respondents. They agree more often that their IT initiatives challenge long-standing procedures and processes, and that IT initiatives often result in sustainable and positive cultural change.

Institutional Effect of IT

Respondents who score their central IT organization's innovation climate as high or high average perceive their institution as having a reputation for being forward-thinking in IT use more often than other respondents. They also overwhelmingly agree that the IT unit fosters innovation and experimentation. Further, these respondents agree that the institution's leadership understands IT's value, that IT is a prominent element in their institution's strategic plans, and that the IT organization is increasingly influential.

Technology Architecture and IT Infrastructure

Respondents who report that they have a higher IT innovation climate agree more often than other respondents that their campus leadership views the campus IT infrastructure as an important institution-wide asset. At a more detailed level, these respondents also agree more often that the central IT organization is actively involved in the institution-wide IT architecture—setting and communicating standards and assuming final authority for infrastructure decisions—and has an institution-wide technology infrastructure that accommodates emerging technologies.

Conclusion

These findings provide strong evidence that developing IT leaders who can foster environments that support innovation has high payoffs for higher education. This discovery is especially significant when viewed in contrast with the relatively low central IT organization innovation climate scores reported across the respondent population.

Endnotes

1. Adapted from A. C. Rusaw, *Leading Public Organizations: An Interactive Approach*, Harcourt College Publishers, 2001.
2. Ibid., pp. 214–216.
3. J. Howell and B. Avolio, "Transformational Leadership, Transactional Leadership, Locus of Control, and Support for Innovation: Key Predictors of Consolidated-Business-Unit Performance," *Journal of Applied Psychology*, Vol. 78, No. 6, 1993, pp. 891–902.
4. These observations are largely consistent with the findings of Howell and Avolio.