**Project Background**

**Purpose**
The Center for Digital Education was commissioned by CenturyLink to conduct an exploratory survey on the status, acceptance, and perceived benefits of connected campus technologies.

The ideal outcome of the project is to gauge the status of connected campuses in relation to the four pillars mentioned in CenturyLink’s Government Brief: 1) engage and educate; 2) ensure safety; 3) reduce operating costs; and 4) increase revenue. Questions were asked about implemented connected campus technologies, procurement plans, current opportunities and infrastructure.

Data collected are intended to inform CenturyLink’s publishable report and research-driven infographic.

**Methodology**
The Center for Digital Education was commissioned to survey 125 higher education officials. In total, 138 responses were received from the higher education community. Survey respondents were asked 20 questions.

A survey instrument was developed in partnership with CenturyLink to determine the acceptance of the connected campus and gauge the status of implemented Internet of Things (IoT) technologies at campuses.

The survey was fielded to the Center for Digital Education’s proprietary Exchange community in June 2017.
Q1 – What is your job function?

- Professor/Teacher: 34%
- Director/Provost/Dean/Staff: 17%
- Tech Manager/Coordinator/Specialist/Administrator: 13%
- CIO/CTO/IT Director/Staff: 12%
- Curriculum/Instructional Learning Manager/Librarian: 10%
- President/Vice President/Chancellor/Staff: 7%
- Business/Purchasing Manager: 1%
- Other: 7%

n = 138
Q2 – Please identify the response below that best describes your institution of higher education:

- 47% 4 year public
- 25% 4 year private
- 24% 2 year public
- 1% 2 year private
- 1% Training or vocational school
- 1% Other

n = 138
Connected Campuses

Perceptions and Status
Key Findings

✓ A majority of respondents report being familiar with the concept of a connected or smart campus before taking the survey.

✓ A majority of respondents already consider their campuses connected or in progress to being connected.

✓ Overall, connected campuses are an accepted and envisioned future for respondents’ institutions.
Over three-quarters of respondents were familiar with the concept of connected/smart campuses before taking the survey.
The majority of respondents think connected campuses are an accepted future for higher education at their institutions.

Q4 – Do you think the connected campus or smart campus is an accepted and envisioned future for higher education at your institution?
Most respondents would classify their campuses as connected or in progress to becoming connected

- Yes: 48%
- In progress: 38%
- No: 14%
- Do not know: 1%

86% of respondents classify their campuses as connected or in progress.
Private, four year institutions appear to be slightly behind public institutions when it comes to being a connected campus.
Connected Campus Technologies

Implementation and Benefits
Key Findings

✓ Digital signage and collaborative learning spaces are the most frequently implemented connected campus technologies
✓ “In progress” campus have not implemented intelligent classrooms and collaborative workspaces to the same extent as connected campuses

✓ A majority of respondents agree there are opportunities for IoT at their campuses

✓ The top two perceived benefits of IoT technologies are teaching resources and student engagement
✓ These are also the top two experienced benefits
Top Ten Implemented Technologies

Current connected technologies on campuses:

- Data driven research and decision making: 32%
- HVAC and energy conservation: 34%
- Data analytics: 35%
- Cybersecurity management: 36%
- VoIP: 38%
- Facility security (monitoring, surveillance): 39%
- Public and student safety (E-911/incident response): 42%
- Intelligent classrooms: 42%
- Collaborative learning spaces: 45%
- Digital signage: 46%

n = 138

Q15 – Which of the following connected technologies have already been implemented at your institution? Select all that apply.
Campuses Are at Different Stages of Implementation

Intelligent classrooms are implemented after other connected technologies

Q15 – Which of the following connected technologies have already been implemented at your institution? Select all that apply.

- Data driven research and decision making
- Cybersecurity management
- Data analytics
- Digital signage
- Collaborative learning spaces
- Intelligent classrooms

n = 138

© 2017 e.Republic
Respondents See Beneficial Opportunities for IoT

88% of respondents see beneficial opportunities for IoT technologies

✓ 36% report current opportunities for implementing IoT technologies on campus, but for others there are hurdles

✓ 31% of respondents indicate that funding is difficult to prioritize

✓ 14% say technological infrastructure needs to be improved first

✓ 7% of respondents report they see no current opportunities to implement IoT technologies, but they would be beneficial if they were implemented

n = 138
Most respondents’ campuses have experienced the following benefits from implementing IoT technologies:

1. 47% Teaching resources
2. 46% Student engagement
3. 29% Research resources
4. 27% Data analytics
5. 26% Facilities management (e.g., utilities monitoring)

n = 138
Top Ten Perceived Beneficial Outcomes of IoT

More respondents report perceiving benefits of IoT technologies than having experienced them

Q7—Which of the following beneficial outcomes has your campus already experienced from implementing IoT technologies and/or transforming into a connected campus? Select all that apply.

Q8—Which of the following beneficial outcomes do you believe could be realized from implementing IoT technologies and/or transforming into a connected campus? Select all that apply.

Research resources: Perceived 29%, Experienced 30%; Improved traffic flow: Perceived 30%, Experienced 13%; Improved physical security: Perceived 31%, Experienced 15%; Improved data security: Perceived 36%, Experienced 23%; Simplified administration: Perceived 38%, Experienced 12%; Facilities management: Perceived 41%, Experienced 26%; Cost savings: Perceived 43%, Experienced 20%; Data analytics: Perceived 54%, Experienced 46%; Student engagement: Perceived 54%, Experienced 47%; Teaching resources: Perceived 56%, Experienced 47%
Connected Technologies

Procurement, Drivers and Plans
Key Findings

✓ The top technologies to be implemented or expanded in the near future are data analytics and cybersecurity management

✓ Key drivers for procurement of connected technologies are cost savings and student retention

✓ Most respondents do not know if their institutions have connected campus plans
  ✓ Respondents identified several specific technologies included in plans
  ✓ Safety issues and capacity of current infrastructure are key issues in connected campus plans
Q17 – Which of the following connected technologies will be implemented/expanded at your institution in the next 12-18 months? Select all that apply.

<table>
<thead>
<tr>
<th>Technology</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do not know</td>
<td>48%</td>
</tr>
<tr>
<td>Digital signage</td>
<td>12%</td>
</tr>
<tr>
<td>Collaborative learning spaces</td>
<td>15%</td>
</tr>
<tr>
<td>Intelligent classrooms</td>
<td>17%</td>
</tr>
<tr>
<td>Facility security (monitoring, surveillance)</td>
<td>17%</td>
</tr>
<tr>
<td>Data driven research and decision making</td>
<td>17%</td>
</tr>
<tr>
<td>Cybersecurity management</td>
<td>19%</td>
</tr>
<tr>
<td>Data analytics</td>
<td>20%</td>
</tr>
</tbody>
</table>

**n = 138**
## Key Drivers for Connected Campus Technologies

The student experience is cumulatively the key driver for adopting/expanding connected campus technologies

1. **48% Potential for cost savings**
2. **43% Higher student retention**
3. **38% Improved student learning outcomes**
4. **28% Improved student-faculty engagement**
5. **21% Reduced facilities costs/better resource utilization**

---

**Q18 – What do you consider to be the key drivers for adopting/expanding connected campus technologies? Select up to three.**
Most respondents do not know if their campuses have procurement plans in support of a connected campus.

- 56% Do not know
- 18% No
- 26% Yes

n = 138
Key issues considered in plans for connected campuses are the following:

- Safety issues (including cybersecurity): 56%
- Capacity of current infrastructure: 50%
- Disaster recovery: 42%
- Stakeholder engagement: 42%
- Privacy: 39%
- Consultations with other institutions: 36%
- Consultations with vendors: 33%
- Do not know: 22%
Campus Needs

Infrastructure and Stakeholders
Key Findings

- Critical areas of investment are in security, data analytics, and network infrastructure for both campuses generally and for connected campus projects.

- Half of respondents think their campus will be unable to support emerging technologies within the next two years.
  - Expectations varied among institution types.

- Multi-stakeholder engagement is an acknowledged need for connected campus initiatives by nine out of ten respondents.
Critical Areas of Investment Generally

Respondents identified critical areas for investment for the campus as a whole, independent of connected technologies

- Security, including cybersecurity and physical security: 24%
- Data analytics to provide data-driven insights: 19%
- Network infrastructure: 17%
- Cloud networking: 13%
- Innovative technologies such as IoT: 11%
- Wi-Fi access: 9%
- None of these: 1%
- Other: 1%
- Do not know: 4%

n = 138

Q5 – Which of the following do you personally consider the most critical area of investment for your campus during the next year? Select one.
Investment Needs for Connected Campuses

Respondents familiar with procurement plans for connected campuses indicated that specific technologies need to be procured in tandem.

- Bandwidth improvements: 39%
- Network modifications: 36%
- Data analytics: 36%
- Cybersecurity: 36%
- Cloud infrastructure: 33%
- Technologies to secure the physical environment: 17%
- The plans do not require specific technologies: 6%
- Other: 3%
- Do not know: 28%

n = 36

Q13 – Do connected campus procurement plans require any of the following specific technologies? Select all that apply.
Nearly a quarter of respondents report that their current campus infrastructure cannot handle emerging technologies for the next year as they move toward being a smart or connected campus.

- Yes, our current infrastructure can support emerging connected campus technologies for at least the next five years: 23%
- Yes, our current infrastructure can support emerging connected campus technologies for at least the next year: 36%
- No, our current infrastructure cannot handle emerging technologies in support of a smart campus for the next year: 22%
- Other: 1%
- Do not know: 18%

58% of respondents think their campuses will soon be unable to support emerging connected technologies.
There are variations in perceptions of capacity to handle smart and connected technologies by institution type.

Q16 – Do you think your current campus infrastructure can handle emerging technologies in support of a smart campus?
Multi-Stakeholder Engagement Is Necessary

Respondents indicate that connected campus implementation requires engagement and it will benefit students, administration, and faculty.

Stakeholders Required?
- Yes: 89%
- No: 4%
- Do not know: 7%

Who Would Benefit the Most?
- Students: 83%
- Administration: 70%
- Faculty: 67%
- Facilities: 39%
- Larger community: 23%
- Alumni: 20%
- No one: 1%
- Other: 2%
- Do not know: 4%

Q20 – Do you believe smart or connected campus implementation requires broader stakeholder engagement (student, leadership, larger community, etc.)? / Q9 – Which stakeholders do you believe would benefit the most from IoT technologies in a connected campus? Select all that apply.
46% of respondents report their administrations have an interest in or need for implementing data analytics and management services.

Q10 – Does your campus administration have an interest in or need for implementing data analytics and management services?
Perceived Benefits from Data Analytics

Data-driven decision-making is the top perceived benefit of data analytics and management

- Data-driven decision-making: 64%
- Time savings from improved data management: 30%
- Streamlined records management: 28%
- Cost savings: 23%
- Automated workflows for administration: 23%
- Improved research capabilities: 22%
- Simplified administrative processes: 22%
- Improved data security: 17%
- Reduced facilities costs/better resource utilization: 14%
- Reduced staffing needs: 9%
- Other: 3%
- Do not know: 4%

n = 138
Critical areas of investment were viewed differently by respondents

<table>
<thead>
<tr>
<th>Status</th>
<th>Data Analytics</th>
<th>Network/Infrastructure</th>
<th>Security/Safety</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Benefit</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interest/Need</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Procurement Plans</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Critical Investment</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Connected Campus Plans</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
Overall Key Findings and Summary

✓ Most see connected campuses as the future and consider their campus as connected or on the way to becoming connected

✓ Higher education officials see beneficial opportunities for IoT technology implementation
  ✓ Top benefits are teaching resources and student engagement
  ✓ Top drivers are cost savings and student experience

✓ Respondent’s perceptions of the connected campus vision:
  1. Engage & educate: agreed
  2. Reduce operating costs: yes, but secondary
  3. Ensure safety: not yet experienced, but one-third anticipate this benefit
  4. Increase revenue: not yet experienced or expected
Recommendations

✓ Connected campus plan template and effective practices in developing them
  ✓ Additional research such as interviews would be needed to support content

✓ Benchmarking Survey:
  ✓ How is the connected campus evolving?
Thank you!

Seeking additional marketing intelligence? Ask about our other products & services such as:

• Surveys & Interviews
• Navigator Subscription (online state/local govt. opportunities and market intelligence portal)
• Market Playbooks & Certification Courses
• State/Local Government and Education Sales Training