



# How Edge Computing is Enabling the Future of Higher Education

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# Overview

As technology continues to evolve and become increasingly integrated into the day-to-day operations of higher education institutions, IT leaders and their institutions are forced to confront numerous internal and external challenges. For example, cyberthreats such as ransomware can bring school systems to a halt or expose confidential student data to bad actors, and attempting to merge new IT infrastructure with legacy systems can put interoperability, bandwidth, and data at risk. To mitigate these emerging challenges, IT leaders in the higher education industry are turning to new technology like edge computing to ready their institutions for the future.

Schneider Electric conducted a survey of U.S. ITDMs in the higher education industry to recognize how teams and institutions are utilizing edge computing, identify existing benefits of and barriers to using edge computing, and uncover how edge computing will transform the future of higher education.

This research finds that higher education institutions are utilizing edge computing technology to tackle challenges surrounding cybersecurity, data protection, and legacy IT infrastructure by increasing scalability and flexibility, integrating IoT devices, and providing greater support for bandwidth-intensive applications. These technologies promise to improve the student experience, enhance security and privacy, provide greater remote access to resources, and more. As edge computing and its applications continually evolve, ITDMs expect edge computing to transform the higher education industry over the next five years by enhancing research capabilities, empowering real-time data analytics, and revolutionizing online learning.



## About The Study

The “How Edge Computing is Enabling the Future of Higher Education” report is based on a survey conducted by TEAM LEWIS Research on behalf of Schneider Electric. This research explored familiarity with edge computing among IT leaders in the higher education industry, adoption and use of edge computing, benefits and challenges of edge computing, and forward-looking applications of edge computing in higher education. The findings detailed in this report are based on data collected in the study, which consisted of 500 total responses from ITDMs in the United States in the higher education industry from August 16, 2023 to August 28, 2023 with a margin of error of +/- 4.3 percentage points.

# Use and Familiarity with Edge Computing

To address evolving IT infrastructure in the higher education industry, IT leaders are familiarizing themselves with the newest technologies like edge computing.

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**89% of ITDMs** in higher education say they are familiar<sup>1</sup> with edge computing.

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Almost half (47%) say they are extremely familiar with edge computing. Further, nearly nine in ten (87%) report that their institution is prepared<sup>2</sup> to leverage edge computing.

ITDMs can use edge computing to confront the barriers they are facing in the modernization of their institutional IT infrastructure. However, despite its technological benefits, half (50%) say one of the greatest challenges their organization is currently facing is finding skilled IT professionals to manage new technologies like edge computing. Additionally, nearly two in five (38%) say cybersecurity and data protection concerns are two of the greatest difficulties in modernizing their institutions' IT infrastructure — friction points that edge computing has been known to alleviate.

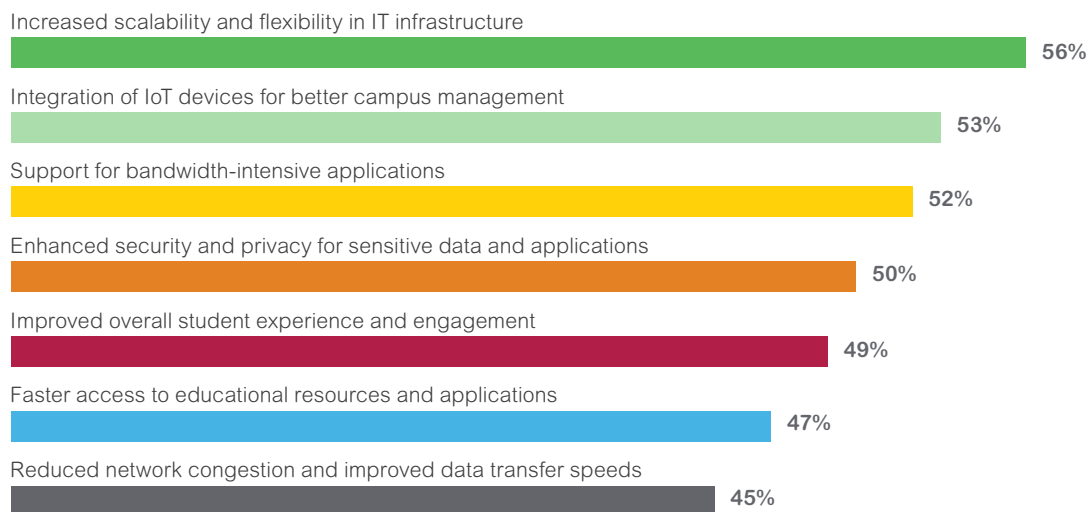
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**95% of ITDMs** in higher education report that their institution has used edge computing technology.

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To date, higher education institutions have utilized edge computing technology for a variety of purposes, including increasing scalability and flexibility in IT infrastructure, integration of IoT devices for better campus management, and support for bandwidth-intensive applications such as AR / VR and video streaming.

## How has your institution used edge computing to date?



ITDMs will need to communicate the value of edge computing and illustrate how this technology enables their institution to address more strategic challenges, such as limited institutional buy-in for IT initiatives (43%) and a lack of clear IT roadmap and strategy (40%).

<sup>1</sup> Extremely / very familiar  
<sup>2</sup> Extremely / very prepared



# Benefits and Challenges of Edge Computing

While IT leaders indicate that their institutions are prepared to leverage edge computing and are currently using it, they are concerned about a variety of negative impacts.

Top negative impacts ITDMs believe their institution could experience due to edge computing include data protection / backup capabilities (38%), a lack of standardized edge computing software stack (36%), and integration with existing legacy network infrastructure (35%).

When asked about the broader industry, they anticipate similar difficulties including data protection / backup capabilities (38%), security / privacy concerns (36%), a lack of standardized edge computing software stack (34%), and integration with existing legacy network architecture (34%).

On the other hand, anticipated benefits for the higher education industry include improved speed / reduced latency (43%), enhanced data security / privacy (43%) and enhanced data processing and analysis (40%). ITDMs also expect similar benefits for their specific institutions, including improved energy efficiency / sustainability (40%), enhanced data security / privacy (39%), and improved speed / reduced latency (37%).

## How Edge Computing Will Transform Higher Education

IT leaders are confident that edge computing has the potential to transform the broader higher education industry in several ways, from empowering better decision-making through real-time data analytics to revolutionizing online learning.

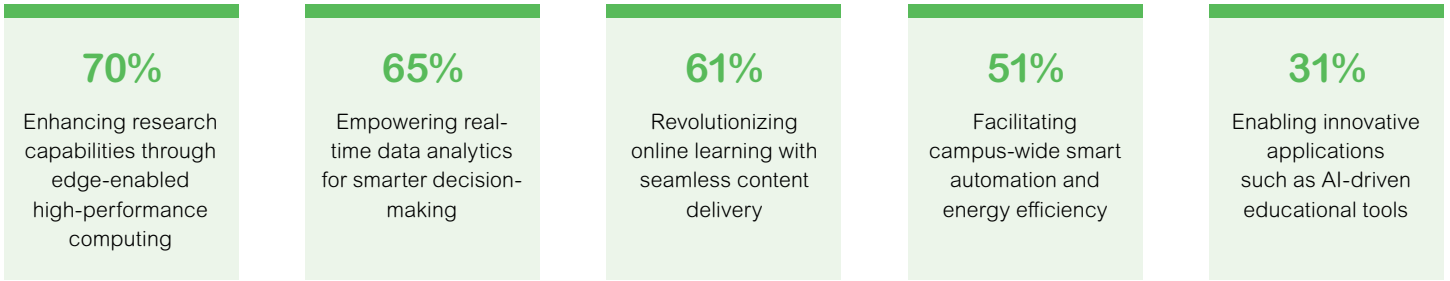
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**87%** agree<sup>3</sup> that edge computing will revolutionize higher education.

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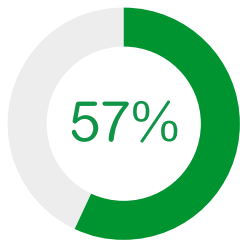


## How do you think edge computing will transform the higher education industry over the next five years?

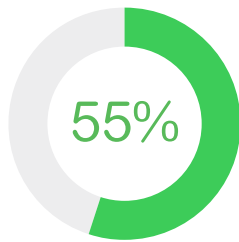


More than half of ITDMs report that remote learning and virtual classrooms, smart libraries and resource management, and student data analytics and predictive modeling will benefit the most from edge computing.

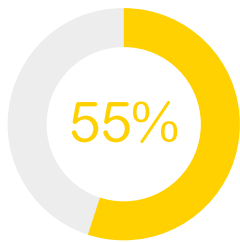
## What parts of higher education do you believe will benefit the most from edge computing?



Remote learning and virtual classrooms



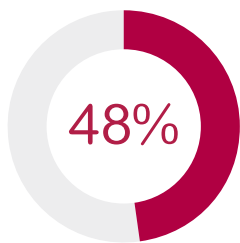
Smart libraries and resource management



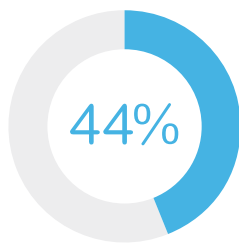
Student data analytics and predictive modeling



Campus security and surveillance



Student healthcare and well-being services

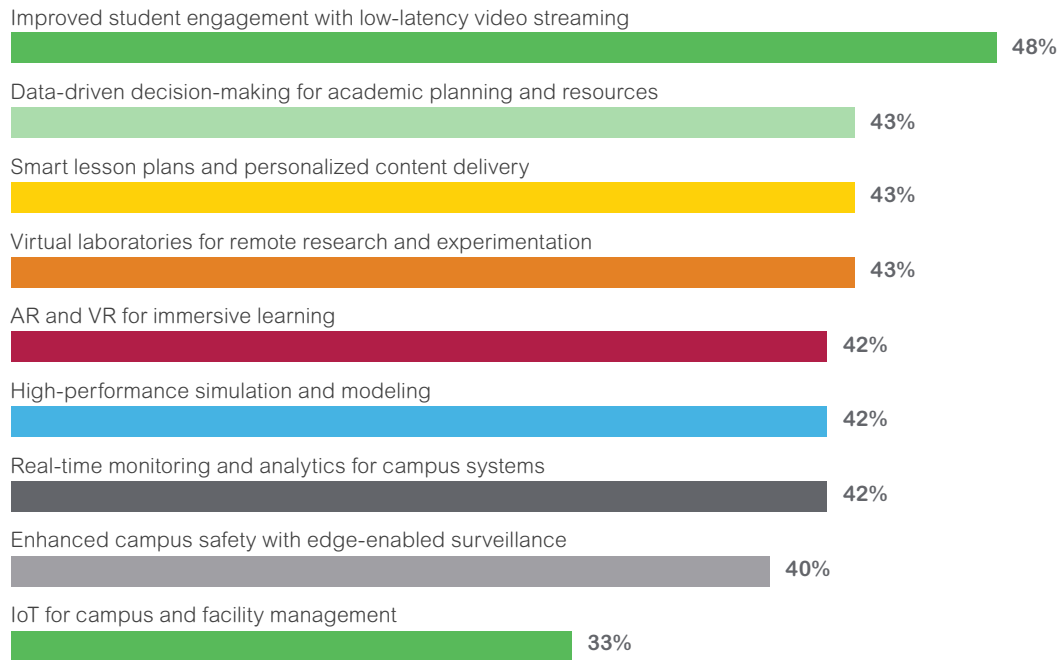


Campus energy management



Respondents are also positive about how edge computing, especially in conjunction with IoT data, could impact innovation, from improving student engagement to smart lesson plans and virtual laboratories and powering greater personalization.

### What innovations in higher education do you believe will benefit the most from edge computing?



Leveraging edge computing and IoT data empowers teachers and student administrators to create smart lesson plans and deliver personalized content to students, facilitating greater student success. In fact, more than four in five (82%) say they are currently using edge computing to power smart lesson plans for their institution's students. Nearly one in five (17%) say they are not using edge computing in smart lesson plans yet but are considering it for the future.

ITDMs say edge computing can enhance the effectiveness of smart lesson plans in multiple ways, including facilitating secure and reliable access to sensitive educational materials (60%), supporting edge-enabled proctoring for remote examinations and assessments (60%), and enhancing the responsiveness of interactive learning activities in real-time (59%).

More than three-quarters (76%) say they are already using edge computing for AR / VR experiences for their institution's students. One in five (22%) say they are not currently using edge computing for AR / VR experiences but are considering it for the future.

ITDMs expect that, among the departments at their institution, IT and Technology Services (54%) and Online Learning and Distance Education (44%) will benefit the most from edge computing.

They are also confident that edge computing can lead to a competitive advantage and enhance the student experience, among other results. Most IT leaders agree<sup>4</sup> that:

- Edge computing provides adaptable IT infrastructure for higher education's growth and demands | **92%**
- Edge computing ensures higher education institutions' adaptability to future challenges through scalability and flexibility | **92%**
- Adopting edge computing will lead to a competitive advantage in higher education | **91%**
- Edge computing enhances campus safety through real-time monitoring and analytics | **91%**
- Edge computing bridges the higher education digital divide for students | **89%**
- Edge computing is the key to enhancing the student experience | **87%**


# Conclusion

The modern student experience has grown increasingly intertwined with technology. Yet, higher education institutions are facing new barriers to realizing technology's benefits every day, from managing increasing volumes of data to protecting IT infrastructure and confidential student data from the latest cyberthreats. Most higher education institutions are turning to edge computing technology to better adapt to and face these obstacles. IT leaders in higher education expect edge computing will be key to the future – from creating a competitive advantage to bridging the digital divide for students and enhancing the student experience.



Boston One Campus  
800 Federal Street  
Andover, MA. 01810 USA  
Phone: + 1 976 794 060  
[www.se.com](http://www.se.com)

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