Building a Secure and High-Density WiFi 7 Digital Learning Environment

Overview

A newly opened self-study exam-prep academy in Songpa-gu, Seoul required a robust digital learning infrastructure to support long hours of intensive study. With students attending online lectures across classrooms, individual study seats, and a 60-seat lecture hall, the environment demanded a network capable of sustaining continuous high-definition streaming under heavy concurrent usage. Besides, the academy needed a structured approach to ensure appropriate usage control between students and teachers. To meet these requirements, the academy installed Zyxel Networks' WBE510D WiFi 7 access points to deliver high-capacity wireless coverage across dense learning spaces. The deployment also incorporated the USG FLEX 700H firewall to support policy-driven network control, while the Nebula secure cloud networking solution provided simplified network monitoring and high visibility for IT administrators managing multiple devices and locations.

Customer
Self-Study Academy in Songpa

Industry
Education

Location
Seoul, South Korea

Challenges

The academy needed to ensure a stable learning environment despite heavy usage, as many students stream Full HD lecture content at the same time, placing significant pressure on wireless capacity and consistency. At the same time, ensuring student focus was a priority, which required restricting access to non-educational platforms and apps like social media and messaging services. In addition, the academy had to support two distinct user groups, students and teachers, with different access requirements, while avoiding complex and time-consuming on-site network management.

Solutions

As students rely on tablets and laptops for online lectures and learning materials, Zyxel Networks' WBE510D WiFi 7 access points were installed to ensure stable wireless connectivity even in high-density environments where multiple users stream Full HD content simultaneously. Built on WiFi 7 technologies such as 4K-QAM, 320 MHz channel bandwidth, and Multi-Link Operation (MLO), WBE510D delivers higher capacity and more consistent performance under heavy load.

Customer Background

A newly opened self-study academy in Songpa-gu, Seoul features classroom and individual study seating, a 60-seat lecture hall for special classes and mock exams, student consultation rooms, and rest areas. Students spend most of the day engaged in digital learning activities, including watching online lectures, accessing learning content, and taking mock exams.

In addition, BandFlex design allows flexible switching between 5 GHz and 6 GHz bands without hardware replacement. Frequency-band and channel planning reduce interference, while a unified network design enables seamless roaming as students move between seats and rooms.

At the core of the network, the USG FLEX 700H firewall was deployed to enable VLAN-based segmentation and enforce differentiated policies for student and teacher environments. In the academy setting, they share the same infrastructure but have distinct needs: students require a stable, restricted network to support focused online learning and self-study, while teachers need flexible access for lesson preparation, administration, and procurement tasks. By separating traffic logically while maintaining a unified physical network, security and operational efficiency are achieved simultaneously. The USG FLEX 700H integrates IPS, anti-malware, and web filtering, and uses Deep Packet Inspection (DPI) to identify application signatures beyond URL-based control. This allows effective blocking of non-educational platforms such as YouTube and social media, while whitelist policies ensure access only to study-related resources. The deployment keeps application signatures up to date via a cloud-based database, ensuring continuous content control even as service patterns change.

Product List

- WBE510D WiFi 7 Access Point
- GS1920-24HPv2 Smart Managed PoE Switch
- USG FLEX 700H Firewall

Results

The academy achieved a more controlled and reliable digital learning environment that supports uninterrupted online lectures across all study areas. Students benefit from a more focused study experience with reduced digital distractions, while teachers can operate efficiently with appropriate network access for daily tasks. All devices are centrally managed through Zyxel Networks' Nebula cloud platform, allowing IT teams to monitor network status, traffic conditions, and device health in real time from a unified dashboard. IT operations became more streamlined while improving overall operational efficiency.

- Restricted access to non-educational platforms to improve student focus
- VLAN-based network segmentation for enhanced security and operational efficiency across student and teacher networks
- High-performance WiFi 7 access points for stable connectivity in high-density learning environments
- Centralized dashboard for real-time network visibility, firmware management, and remote configuration