

# Education Transformation Framework

Building digitally connected schools and education systems in emerging countries



This guide underpins the Microsoft Education Transformation Framework – a process that helps you fast track system-wide transformation through the use of ten critical components, each based on decades of quality research.



# Building an IT Platform in a Limited-resource Setting

In the past, it's been difficult for schools in developing countries to transform learning practice. Barriers such as the high costs of infrastructure and devices, limited power and Internet access, and an overall lack of IT expertise, have made large-scale technology transformations nearly impossible.

Today, however, there is a huge opportunity. A 'sweet spot' of technological advances has developed, including cheaper devices, widespread Internet access and shrinking physical infrastructure requirements thanks to cloud computing. Many schools can move straight to a modern cloud, wireless and a Bring Your Own Device (BYOD) setup in their school, completely leapfrogging older premise-based IT models. This guide steps you through a technology journey in a limited-resource setting. It shows how you can automate and reduce the cost of a modern IT environment that gives students and teachers secure, easy, convenient access to everything they will need to succeed.

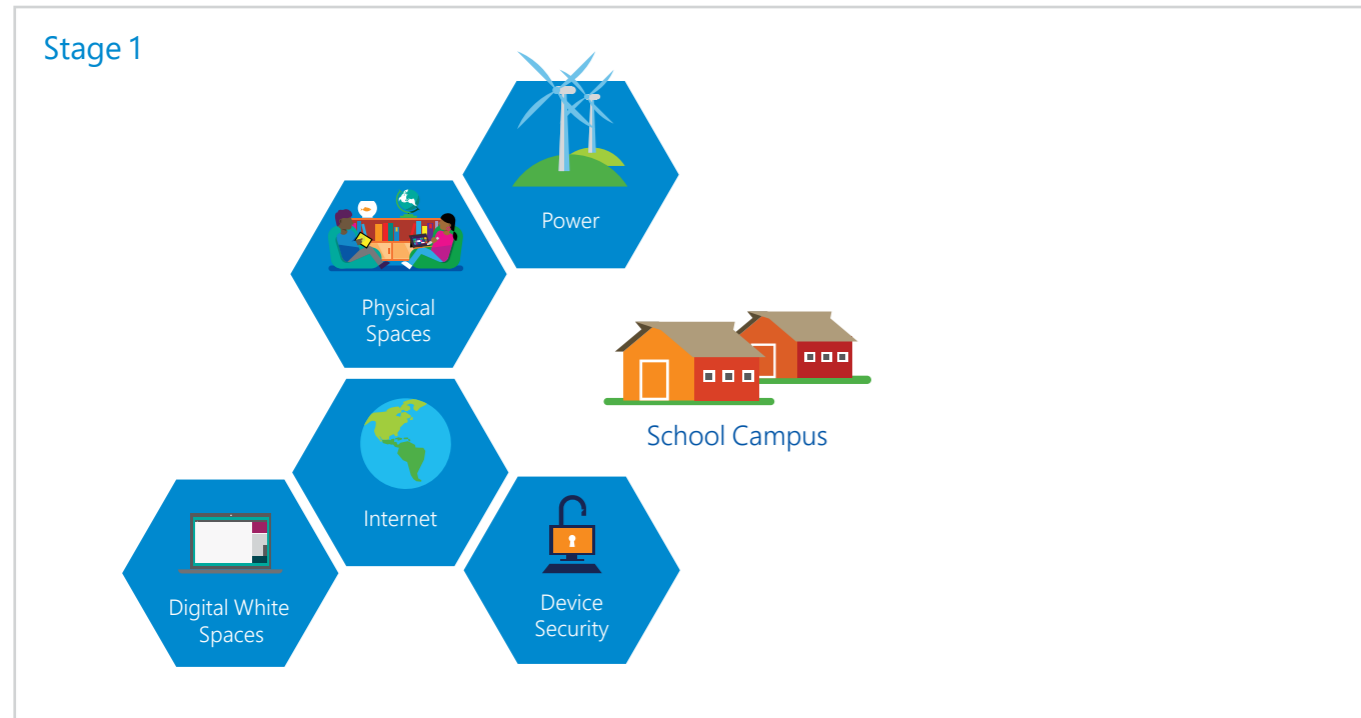
## Why Provide Technology for Learning?

Current Situation	Benefits of Introducing Technology
Students are only learning with 20th century tools	<ul style="list-style-type: none"> <li>Using modern ICT as an additional learning tool builds new skills and keeps learning relevant and engaging</li> </ul>
Students do not leave school equipped with digital skills that the workplace demands	<ul style="list-style-type: none"> <li>When students learn using ICT skills they can help advance their future career opportunities</li> </ul>
Students mostly learn in isolation. There are few opportunities to meet students in other schools or countries	<ul style="list-style-type: none"> <li>Cloud technology lets students take part in collaborative learning – across a classroom, country or the world</li> </ul>
Students can only access resources such as libraries and teacher expertise when inside the school	<ul style="list-style-type: none"> <li>Internet connections provide access to rich resources, people and learning opportunities – inside and outside the classroom</li> </ul>
When students need a computer they must go to the computer lab	<ul style="list-style-type: none"> <li>When students are supplied with a device or can bring their own, they can take everything they need to learn with them. This way, technology can intuitively support all kinds of learning – such as recording a science experiment or taking notes</li> </ul>
Teachers find it difficult to personalize student learning	<ul style="list-style-type: none"> <li>Technology can allow students to learn in their own style, where and when they like. Students can easily create their own learning spaces and activities</li> </ul>
Students must collate a paper-based record of their own achievement over the years	<ul style="list-style-type: none"> <li>Technology enables students to record their work in e-portfolios</li> </ul>
If a student is absent they must catch up missed work when they return	<ul style="list-style-type: none"> <li>Technology makes it possible to connect absent, distant and incapacitated students to cutting-edge learning</li> </ul>
If a student lives too far from the school or is physically unable to attend, they have no access to education	<ul style="list-style-type: none"> <li>Videoconferencing helps them experience classes as if they are there and online tools help them connect with peers and complete their homework</li> </ul>



# 1. Connect Your School

The basic foundation for technology is power, Internet connectivity and a secure, well-designed WiFi network. We recommend starting with a basic infrastructure like this, which can be evolved in easy stages over time, until eventually you can run a full WiFi and Cloud technology model with user and device management.



## Source a Sustainable Power Supply

When there is no power grid, you need a little ingenuity. Thankfully, many developing countries have abundant renewable energy potential and can benefit from the positive economic spillover generated by a robust, culturally-appropriate renewable energy project. In most cases the project will require public support and government policies, but it is also possible to attract private investment, charity aid or find a private-sector partner willing to share in the development.

## Find Reliable Internet Access

Negotiate with your local telecommunications companies for the best rates across schools or districts – rather than one-off arrangements – to increase buying power. Opt for the most reliable provider to avoid service interruptions and faults.

## Is TV White Space Spectrum an Option?

If you are in Jamaica, Namibia, the Philippines, Tanzania, the UK or USA, you may be able to use unassigned frequencies in the VHF and UHF television broadcast bands with premium wireless broadband broadcasting that has the ability to transmit over greater distances with increased coverage, significantly lower power consumption and reduced network and end-user costs. To find out more, go to [whitespaces.microsoftspectrum.com/](http://whitespaces.microsoftspectrum.com/)

## Setup a WiFi Network

WiFi opens up your entire school to technology use, rather than limiting it to Internet-connected computer rooms. It also makes it possible to introduce a Bring Your Own Device (BYOD) environment in the future.

To begin, set clearly defined goals. Some questions you might consider include:

- **Users:** Who will this network serve? Will there be different kinds of users? Will different kinds of users require different levels of access?
- **Coverage:** Where are the users? Do they move around from place to place? How far does your WiFi network need to reach?
- **Function:** What will users do with your WiFi network? Will they need seamless coverage for video-calling, or just basic coverage for standard Internet use?
- **Capacity:** How many users and devices will the network need to support? How about next year? How about the next ten? How will you expand capacity?
- **Safety:** How will you maintain the network? How will you ensure security?

## Adjust Physical Learning Spaces

Now that it is possible for staff and students to move about freely with a WiFi-connected device, it's time to consider how this impacts physical learning spaces. Does everyone feel sheltered and safe? Is there ample lighting to help counter the brightness of the screens? Do students prefer to learn at desks, on cushions or on the floor? Is it possible to accommodate all of these preferences? Is it necessary for the teacher to stand in front of rows of students, or is there another way?

A lack of physical resources is not always a constraint. Professor of Educational technology and TED Prize winner, Sugata Mitra, has found that a reduction in resources brings increased cooperation. For example, even if there is only one device between five children, it creates an atmosphere of shared learning that can lead to many boosted outcomes, such as developing reading comprehension that is far beyond the expected level for their age.\*

## Keep Devices Charged

Even if your school is powered, you may be looking for ways to help students charge their devices for home use. Solar powered chargers work well in sunny locations. Kinetic chargers use a small hand crank to charge a device. These can also be wired into bicycles, so the rider can charge a battery as they cycle.

## Keep Devices Secure

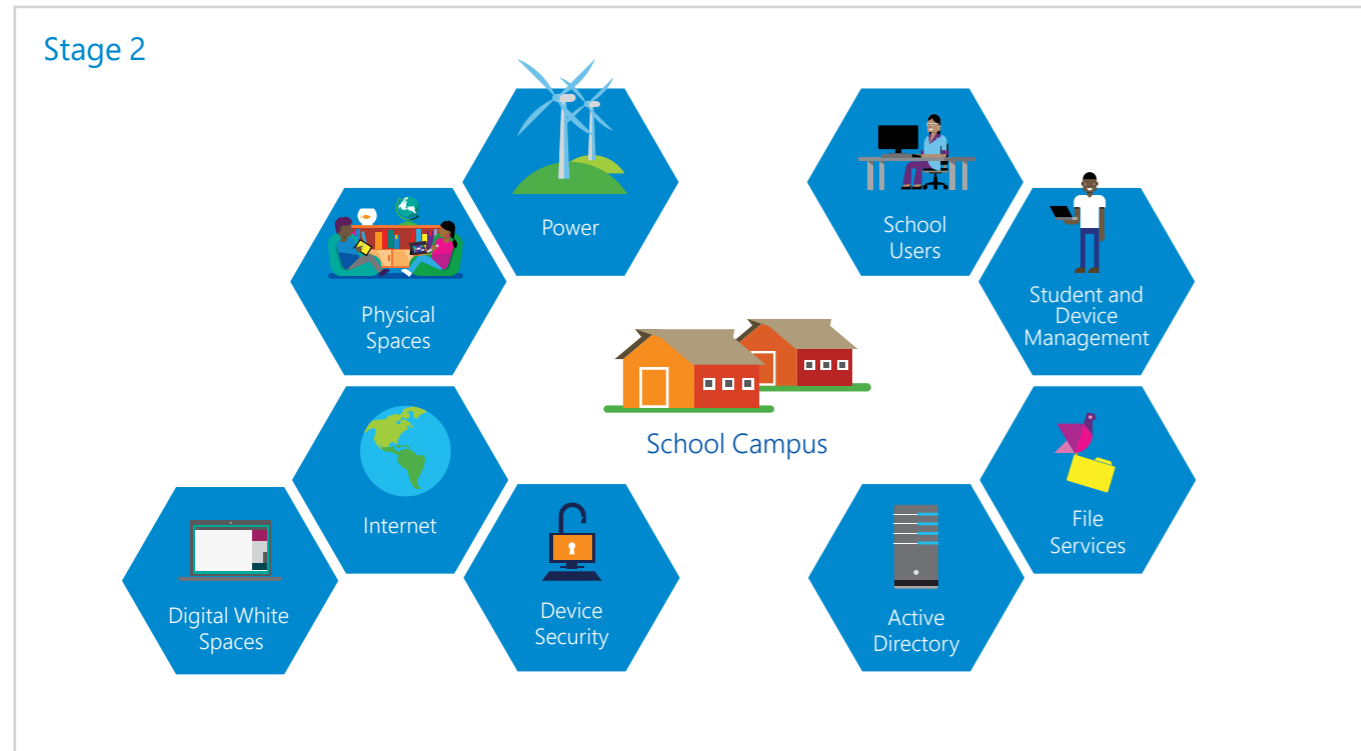
Designate a secure cupboard, room or vehicle where devices can be safely stored overnight. Set up a roster or security system to ensure devices are accounted for.

\*<http://blog.ted.com/what-can-the-american-and-british-education-systems-learn-from-classrooms-in-the-developing-world/>



## 2. Lay the Groundwork

Now that your school has the basic founding infrastructure, you're ready to pilot the use of devices. This requires setting up and managing user identities and passwords, so that you can ensure only the right people access your network.



### Pilot Devices

Begin by investing in a small set of devices to share. You could start by initially only offering these to teachers, so they have time to become familiar with how they work. Start with something as simple as using a device to do roll call, before moving on to teaching lessons with technology. Once your teachers are on board, you can start to consider expanding devices to students or opening a BYOD model. For more information on BYOD, download our official guide: [www.microsoft.com/australia/for\\_schools/byod.html](http://www.microsoft.com/australia/for_schools/byod.html)

### Introduce Management

Before your entire school can begin using WiFi and mobile technology, you need to set up a way to manage user identities and passwords. This ensures the right people have access to the right things on the network.

Microsoft Active Directory provides a single point where you can manage your user accounts and registered devices, as well as your applications and servers. The most common way to manage is to create Organizational Units (OUs) for your school Users, Groups and Computers. For example, your OUs might be Administration, Teachers and then each year group of your students. You can then divide this further using groups, such as departmental groups and clubs.

Group Policies make it easier to deploy standard sets of software to computers and devices in your school, as well as help protect the security and configuration of your network. To do this you need to be able to manage licenses. For example, if you create OUs for mobile devices owned by a specific year group, you can manage the software of that entire year group at once.

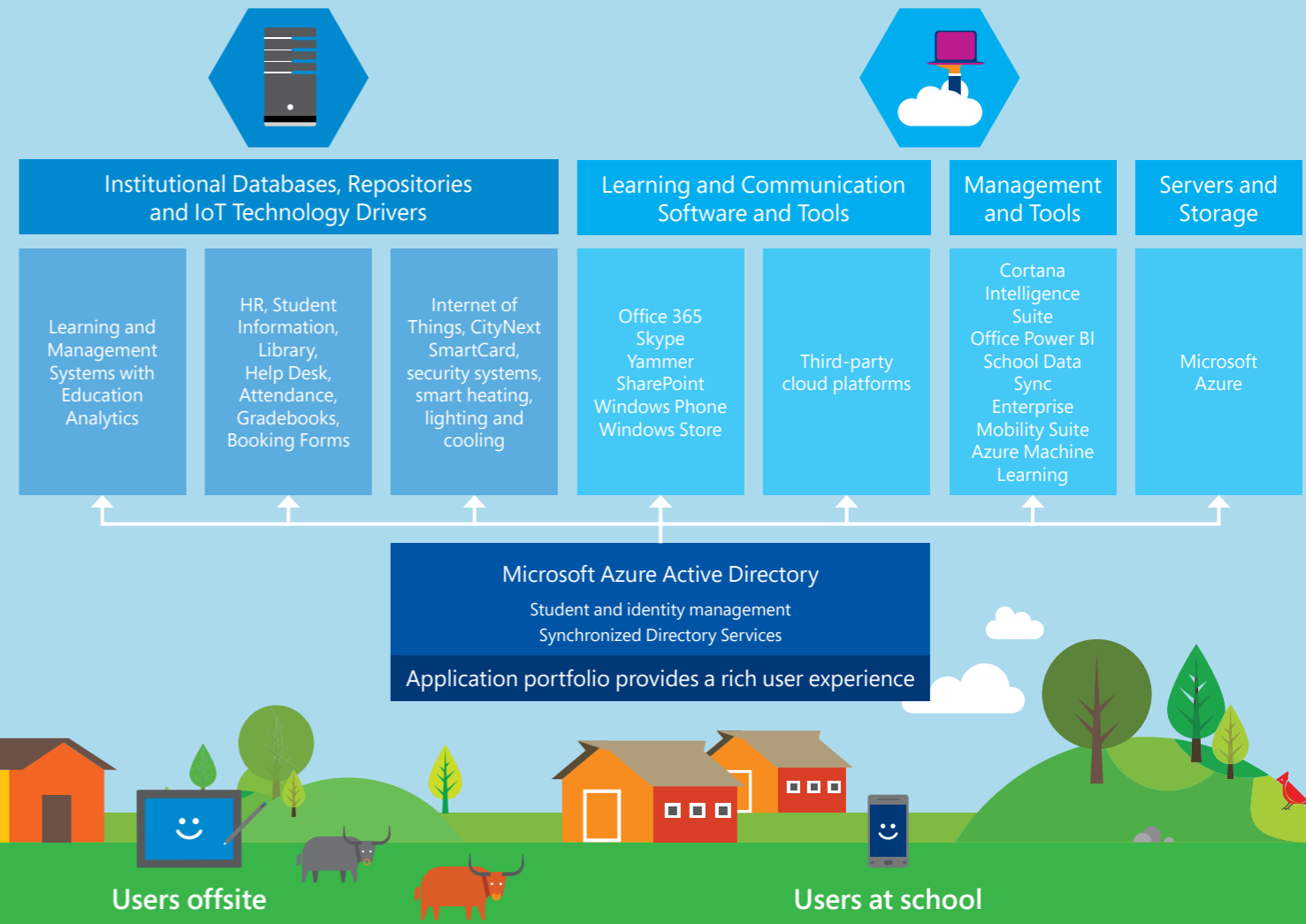
It sounds obvious that if there's one computer and five children, they can fight, in which case nobody gets to do much, or they can come to an agreement about what they want to do. I think it's very healthy for children to find agreement.

Sugata Mitra,  
winner of the TED prize 2013

# 3. Transformation

Microsoft CityNext Education solutions provide a broad technology platform of cloud, advanced analytics, mobile and social technologies designed to help schools transform.

Single sign-on to a personalized application portfolio of learning and management tools, school resources, performance metrics etc.



Users on the go

Users offsite

Users at school

## Simple Steps to Transformation

Microsoft CityNext solutions provide a broad technology platform of cloud, advanced analytics, mobile and social technologies to underpin new ways of learning, managing, reporting and collaborating in schools.

Transformation is based on introducing cloud-based services, automating manual processes and providing powerful learning, social and collaboration software with self-service capabilities for students and staff.

### Introduce Cloud-based Services

The aim is to provide students and staff with rich learning capabilities while minimizing technology management costs through Office 365, Azure, and Microsoft Intune.

#### Rationalize your SaaS portfolio

Use Azure AD cloud App Discovery to discover all the SaaS in use in your environment. Then replace overlapping applications with all-encompassing solutions and find alternatives to on-premise applications with SaaS applications to reduce the TCO of your IT.

Once you have your ideal portfolio, register your 3rd party SaaS-applications in Azure AD to provide single sign-on capabilities. Then sync your on-premise AD to Azure AD to provide synchronized data and write-back capabilities between active directories.

#### Deploy Office 365 Education

Office 365 Education has everything you need to kick start next level learning in your school. Students and staff simply sign in with their educational email address to download the latest Office apps including Word, Excel, PowerPoint, OneNote and Publisher on up to five personal devices including, Windows PCs, Macs, tablets, iPads, phones and Androids.

- Students and staff get 1TB of storage on OneDrive for Business in the cloud, managed by the school giving them plenty of space for school work with easy online sharing.
- Students and teachers can collaborate online and see their changes in real time with Office Online and OneDrive.
- You can use Yammer to set up social media sites for the whole school, subject areas, sporting or interest groups.
- Students and staff can be far more productive using OneNote to type or handwrite notes, capture web pages, record audio/video and embed spreadsheets.

### Improve the User Experience

Provide a consistent experience across PCs, laptops, tablets and smartphones for students and staff.

Students and staff have single sign-on access to services and applications on any device from anywhere. They can also reset their own passwords, establish and manage groups, install applications and their own devices. They can use Office 365 Education on their home computers and devices giving them the same capabilities and experience wherever they work.

### Windows 10

Windows 10 has powerful management features that make it easier to control BYOD and 1-to-1 learning environments. You won't have to worry about keeping student devices up to date. Windows 10 Education has in-place upgrades and dynamic provisioning. Plus it's easy to safeguard identity. Students have the convenience of a password and the added security of the best multi-factor solutions, as well as anti-theft and phishing to protect them online.

- Windows 10 is designed for learning productivity. Students can be better organized with easy ways to snap apps in place and optimize their screen space to show open tasks in a single view. Plus they can create virtual desktops and group things by project.
- Microsoft Edge, a new browser, lets students annotate by writing or typing directly onto web pages.
- You can protect essential student files with disk encryption, data loss prevention and data separation.
- Use the Device Guard feature to lock devices down so they only run the applications you nominate.
- Enroll or unenroll student devices to remotely control accounts, security settings and VPN configurations.





## Provide Secure Access to Resources

Enable students and teachers to use their school credentials to launch applications from a personalized web catalog or mobile app.

Instead of your firewall and network appliances controlling access to services, your security now needs to be tied into identity, which should contain all relevant authorization information. Some services or applications may need to match identity with the assigned device to gain access.

### Microsoft Azure Active Directory (AD)

- Set up single sign-on to simplify user access to Office 365 and other SaaS-applications, as well as on-premises applications from Windows, Mac, Android and iOS devices. Multi-Factor Authentication prevents unauthorized access to both on-premises and cloud applications.
- Set up Self-service Password Change and Reset for students and staff.
- Set up Self-service Group Management for teachers or year groups.
- Use the Application Proxy module to publish on-premise web applications with secure remote access and single sign on.
- Security monitoring and alerts and machine learning-based reports identify inconsistent access patterns to mitigate potential threats

## Strengthen Device Management

The aim is to confidently allow students and teachers to bring personal devices to school.

Manage BYOD and institution-owned tablets and smartphones with Windows Intune. These 'trusted devices' have single sign-on capabilities and (if required) enforced security policies.

This also gives you an organizational view of device with smart reporting and proactive security management.

### Microsoft Azure AD

- This comprehensive identity and access management cloud solution lets you manage users and groups and provide secure access to your on-premise and cloud applications.
- Makes it easy to manage devices and provide Multi-Factor Authentication (MFA) capabilities if required.

### Microsoft Intune

- Has an option for managing "difficult to reach" devices that are consistently outside firewalls. This helps ensure they are secure and have access to the applications needed.
- Has a cost-effective way to extend management coverage to small or remote schools and campuses by creating an integrated environment.
- Can be deployed without on-premise infrastructure.

## Introduce Education Analytics and Research

To improve institution effectiveness, you now want to be able to extract real-time data (performance, attendance, cost, etc) from your systems to track and evaluate trends and improve planning and decision making.

Microsoft SQL Server can give you a 360-degree view of performance and operations with easy-to-use PowerBI data visualization tools that simplify access to data and make it easier to share key metrics with stakeholders. You can run it on Windows Azure to get the benefits of cloud computing. To bring additional power including predictive analytics to your organization, use Cortana Intelligence Suite, a fully managed big data and advanced analytics suite that enables you to transform your data into intelligent action.

### Microsoft SQL Server

- Take advantage of the power of advanced analytics in your school to monitor, analyze, and report on student and teacher information, create analytical models to predict performance and improve budget management through clear insights.
- Bring together valuable data from multiple sources, and get the big picture. For example, correlate student test scores against graduation rates, or create an early warning system for dropout prevention by using data about student absences.
- Give teachers and administrators a clear picture of student performance at an individual or group level so they can adjust instruction accordingly. You can speed up analysis and time to insight with the familiarity of Excel and Power BI in Office 365, as well as access via mobile devices.
- Quickly and easily generate the reports you need for your school board and for local, state, and federal requirements. Plus, improve responses to legislative and grant requests to help maximize funding opportunities.

# New Microsoft Technologies for Education

Microsoft is at the forefront of learning innovation with imaginative ways to help teachers and students enjoy contemporary, engaging learning experiences. Have you tried these new technologies?

## Create Flipped Classrooms with OfficeMix

Designed with educators in mind, OfficeMix is a free add-in for PowerPoint with everything you need to easily create and share interactive online lessons.

[mix.office.com](http://mix.office.com)

[Office Mix LTI support](#) (integrate experience into LMS)

## Quickly Build Classes with School Data Sync (SDS)

Formerly known as School Information Sync, this smart technology allows you to build classes based on the rosters in your school's Student or Management Information System. It also allows Partner solutions to easily access roster data in order to provide richer experiences for teachers and students.

[sds.microsoft.com](http://sds.microsoft.com)

## Automate Everything with New Office 365 Education

Starting with a smart new Microsoft Classroom (formerly Class Dashboard) you can set up to automate everything. Simply use School Data Sync to bring in class details from your student information system. Then click to set up student access to class materials, learning tools and apps – all with automated updates.

[classroom.microsoft.com](http://classroom.microsoft.com)

## Manage Lessons More Easily with OneNote Class Notebook

Our popular education software OneNote just got even better. Already renowned as the smart way to share and organise learning, we've updated the Class Notebook feature to make teachers more productive. You can now distribute assignments that show up in Office 365 Education (Microsoft Classroom) and leading Learning Management Systems, quickly review student work, and access the Class Notebook app far more easily. Check it out at:

[onenote.com/classnotebook](http://onenote.com/classnotebook)

[onenote.com/Lti](http://onenote.com/Lti) (integrate experience into LMS)

[onenote.com/learningtools](http://onenote.com/learningtools)

(accessibility support with Learning Tools)

## Enjoy Game-based Learning with Minecraft

Join the many teachers who are using Minecraft to engage and inspire students to think logically and creatively.

[education.minecraft.net/#!](http://education.minecraft.net/#!)

Interested in taking the next step on your transformation journey?

Visit [microsoft.com/education/leaders](http://microsoft.com/education/leaders)