TECHNOLOGY PLAN 2020

Tompkins Cortland Community College

Technology Advisory Group
9/30/2019

Purpose and Vision

The technology plan must drive technical solutions and services to leverage existing technology investments and to identify needed investments in emerging technologies. Priorities identified in the plan must align with the Strategic Goals of the institution.

Tompkins Cortland strives to provide learners and staff members with access to the most current technologies available and to provide the training and support necessary to use them. Technology should be used to connect learners whenever, wherever and however they want to learn. Technology will enable the College to fulfill its mission using the most effective tools to enhance teaching, learning, as well streamlining the supporting and administrative functions of the College.

Commitment to Accessibility

Tompkins Cortland Community College is committed to providing equal access for all qualified individuals to its programs and educational opportunities, including computers and other electronic resources, information technology, and technology-mediated learning opportunities. All purchases of new technology (both hardware and software), and the creation of new electronic resources, shall be compatible with currently available adaptive technology or other readily achievable reasonable accommodations with implementation procedures that are identified and put into practice.

Commitment to Sustainability

The College recognizes that there are many opportunities to improve the environmental impact of information technology operations. The College is committed to implementing strategies geared towards sustainability without compromising the services provided.

Developing the Plan

The technology strategic planning context utilized a combination of planning approaches looking at trends in higher education along with an analysis of institutional opportunities and challenges. The plan was built with three specific viewpoints: the perspective of the students and their use of technology as a learner, how technology is utilized by instructors and the supporting administrative technology and shared infrastructure of the institution. The planning activities identified challenges and opportunities unique Tompkins Cortland.

Student 2020

 Goals established in this part of the plan focuses on the student experience. The critical question is "How does a student effectively use technology to affect positive learning outcomes and be successful in the overall college experience?"

Key issues identified by the Student 2020 sub-committee include:
- The increasingly BYOD (Bring Your Own Device) nature of the student experience. For most students, college is the first time they are depending on technology and devices that they personally own versus school-issued.
- Addressing Digital Literacy of students and recognizing that Digital Nativism and the Digital Divide affect our students in different ways and creates a student body, which has varied experiences with technology upon entering the institution.

Student Survey Findings

A student survey was conducted (appendix A) during the fall 2017 semester. The survey demonstrated that the importance students placed on different technologies was varied. Several technologies received an equal number of "most important" rankings as "least important" rankings. When asked to rank technology services from most to least important, clear leaders did emerge: 1. Wireless Network, 2. Digital Course Materials / Open Education Resources, and 3. College Issued Email Account.
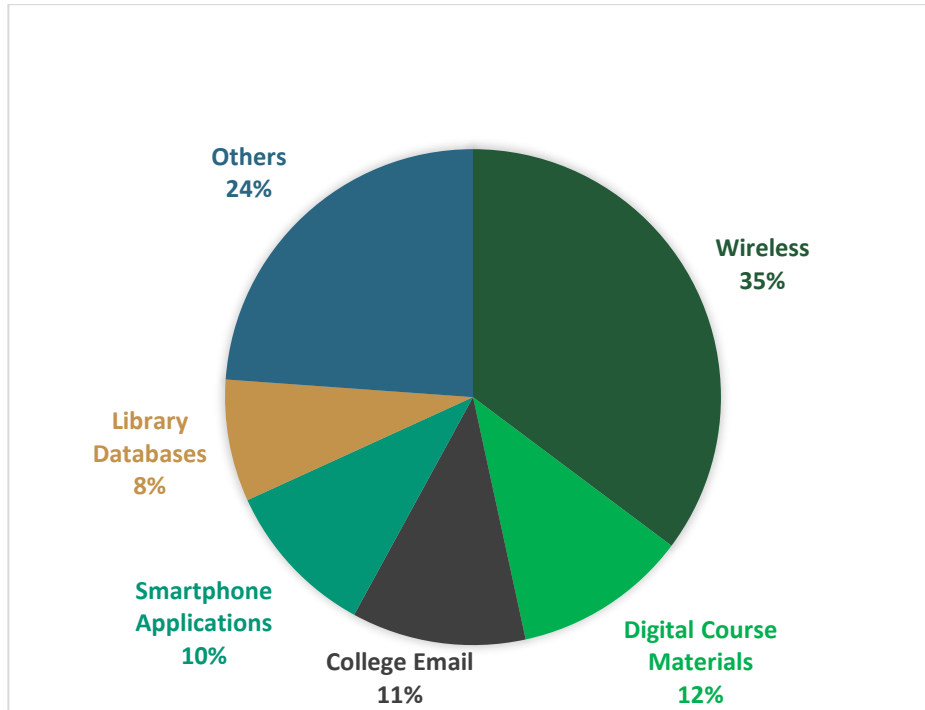

Figure 1: Most important technology as ranked by survey of 107 students

Remote Application Delivery and Virtual Labs

Cloud technology gives us the opportunity to allow students to access required academic software from virtually anywhere. Demand for access to academic software services to users from off-campus has been increasing. Many online courses require course-specific software, but our limited ability to deliver course-specific software to remote users is an obstacle to increasing offerings of online courses and degree programs. Licensing costs often prevent students from purchasing and installing required software on their own computers. By offering remote access to course-specific software in a more flexible way, we can enhance the overall success of our students and create more opportunities for on-premise, online instruction, and HyFlex (hybrid flexible) approaches.

Campuses traditionally offer virtual lab computers as a way to provide the required course-software to online students using campus infrastructure. The traditional approach required a significant investment in on-premises infrastructure and many issues can affect the reliability and consistency of the service. Cloud infrastructure does not rely on campus infrastructure and it does not include large up-front expenditures. Cloud offerings need less expertise to set up and there is no reliance on local physical equipment, redundancy is built-in to the solution. Cloud resources can easily expand or shrink as demand dictates, meaning that the College is spending only what it needs.

Instruction 2020

Modernized and Standardized Classroom Technology

A February 2018 review of classrooms conducted by Campus Technology recognized the the need to refresh our technology. This initiative will require input from leadership and stakeholders. This portion of the technology plan highlights some of our current concerns.

The fourteen most deficient classrooms share the following issues:

- Projectors need to be mounted and not placed on a mobile cart/table/or desk
- Faculty and instructors have only a small area on their desk for books and papers
- Poor projector connections that require faculty to connect either the laptop or document camera manually causes problems. Faculty waste class time trying to get the projector to connect
- Power connections that are antiquated and possibly hazardous
- Poor projected image quality\difficult to view from the back rows
- Cabling is not properly managed using No-Trip-Strip or under-floor conduit
- Projector screens with obsolete ratio of 4:3

In this plan we are recommending the College allocate funding for twenty classrooms between 2020 and 2025. This project will required the development of bid and selection of a suitable vendor partner. The classroom refresh process will result in rooms with the following features:

- Highest standard for power and data links
- Highest quality sound system
- High quality document cameras
- High definition flat screen TVs
- High quality panoramic projectors
- High quality panoramic screens
- Interactive whiteboards
- Remote class pads and wireless response pads.
- Dry erase boards.
- Movable furniture

Online Learning, Digital Course Materials, and Open Educational Resources

The College developed and submitted an Open SUNY Institutional Readiness Implementation Plan in September 2018. The purpose of the Implementation Plan template is to help the College develop a comprehensive plan to execute, to ensure quality, and continuous improvement in the distance-learning program. The authors of this Technology Plan acknowledge the 2017-2018 Open SUNY Institutional Readiness Implementation Plan as support the recommendation made in that plan.

The College currently uses Blackboard as our LMS (learning management system). The development of this product has slowed in recent years with fewer updates and improvements to the user interface and functionality for students and faculty. Open SUNY is focusing on providing marketing for online programs, development of online programs in high need areas, and is looking for pathways and partnerships to build growth and degree programs. As SUNY continues to put resources and focus toward online learning, the College needs to look at ways to capitalize on the marketing and align ourselves with the SUNY initiatives. Online learning and LMS administration are a triad of instructional design, LMS platform, and technical user support. Other LMS options are gaining ground on Blackboard's dominance.

As a campus we need to focus on improving the outcomes of the online experience for all students, one way to do this would be through the use of Blackboard Ally - an accessibility tool integrated into Blackboard for all students or by exploring more modern and user friendly LMS's such as Canvas.

It is an important point to note that Open SUNY is combining the shared services and support for Online Learning 'Blackboard' and OER. The shared service model and cross functional end user support will be the way that SUNY moves into increased profitability and market share.

Systems 2020

This section of the plan focuses on the needs of staff/non-teaching members of the College, and the infrastructure.

Issues identified by TAG to explore in this section include:
- Administrative software tools to improve workflows and reduce inefficiencies
- Better integration of existing software systems
- Shared Infrastructure – Wired/Wireless Network
- Internet of Things (IoT)
- Cyber-security

Shared Network Infrastructure

The technology that faculty, staff, and students depend on everyday relies on a complex IT infrastructure. Strengthening and maintaining the infrastructure is critical to continue to deliver valuable IT services. A survey conducted in March 2019 for the College's strategic planning processes indicated the majority of internal stakeholders do not believe that the College has sufficient technological infrastructure to support its academic and non-academic services.

Wired and Wireless

Historically, wired networks provided the necessary high-speed, high-reliability connectivity, whereas wireless networks were a nice-to-have; convenient for some uses but no substitute for the capabilities provided by the wired network. Wireless networking performance continues to increase and has been able to gain ground in these areas.

A robust and secure wireless network infrastructure will enable TC3 to deploy systems without consideration of the nearest wired connection, or if the device even has the capability of connecting to a wired port. When deploying computers, projectors, smart displays, etc. Campus Technology has to deal with the limitations of the nearest location of a wired Ethernet port. Nearly all of this equipment is capable of connecting to, and managed by, a wireless network.

The existing wireless network is not robust enough to allow us to deploy all systems wirelessly. The wired network also need to be improved to support the wireless network as well as growth in other network connected devices.

Internet of Things (IoT) – Potential Impact

The Internet of Things (IoT) consists of objects endowed with computing power and capable of transmitting information across networks. Connections allow various functionality from remote management to status monitoring to environmental alerts. Education institutions can potential use IoT Capabilities of IoT, leveraging data to streamline processes and promote situational awarness. As more smart devices arrive on campuses, institutions are examining implications on network demands, security, and privacy.

One example the College may leverage IoT is in building management and maintenance. Network connected sensors would allow us to more easily manage, maintain and improve the efficiency of connected systems, such as HVAC, water temperature, lights, etc. For these systems to work effectively

the campus wireless network has to have sufficient capacity, reliability and security. A robust and modernized network infrastructure will be required to support this.

Cybersecurity

Educational institutions are increasingly at risk for cyberattacks and data breeches. The College requires access to Information Security tools and services which provide value and are affordable. The threat environment significantly outpaces the internal resources of the College. Therefore it is in best interest of the College to take advantage to free and shared services for it's cybersecurity initiatives.
Getting unbiased outside opinion is paramount to ensure Information Security ideas and initiatives are effectively adopted at the College.

The College is currently working with the Department of Homeland Security for some limited no-cost cybersecurity engagements. This collaboration has been very helpful and should continue. The College should also strongly consider joining the SUNY SOC (Security Operations Center). The mission of the SUNY SOC is to provide expertise, software, training tools, and resources to help SUNY schools improve their information security posture. The SOC enjoys the unique perspective on Information Security throughout SUNY and is familiar with the challenges faced by campuses. This knowledge equips the SOC to better assist campuses when facing Information Security problems and decisions.

Goals and Objectives

The following goals and objectives have been established to ensure the College has a robust technology based designed to meet the current and future expectations of faculty, staff, and students.

Goal 1 Improved Wireless

1.1 Ensure that the College deploys and maintains a highly available, high performance wireless networking with full coverage of campus buildings and high traffic exterior green space. Investments must ensure that the network can scale with the expected increase in student use devices as well as expected growth in IoT devices used in administrative functions and facilities management.
1.2 Deploy better Wireless Network Access Control system for easier onboarding.
1.3 Replacement upgrade of all existing wireless controller and wireless access points by 2025.

Goal 2 Modernized and Standardized Classroom Technology

2.1 Overhaul twenty classrooms between 2020 and 2025 with the latest classroom technology:
    2.1.1   Room 141
    2.1.2   Room 201b
    2.1.3   Room 260
    2.1.4   Room 262
    2.1.5   Room 264
    2.1.6   Room 266
    2.1.7   Room 268
    2.1.8   Room 269
    2.1.9   Room 287a
    2.1.10 Room 282
    2.1.11 Room 281a

2.1.12   Room 288c
2.1.13   Room 290
2.1.14   Room 294
2.1.15   Four classrooms additional TBD

Goal 3 Availability of Instructional Technology and Applications
3.1 Implement a cloud-based virtual Lab/remote application solution.
3.2 Full computer refresh of academic computers according to existing replacement cycle.
3.3 Refresh of Specialized Computing Labs

Goal 4 Improved Administrative Information Systems and Technology
4.1 Standardize Integrations. Joins applications with standard integration approaches and processes. Implement tools built on open standards such as JSON and REST. Focus on reusable integrations to maintenance compared to point-to-point integrations.
4.2 Investigate, support, and promote the use of analytics and artificial intelligence for administrative decision making and process oversight.
4.3 eForms: increase use of electronic workflows and approval forms.
4.4 Full computer refresh of administrative computers according to existing replacement cycle.

Goal 5 Robust Core Network Infrastructure
5.1 Ensure that the core IT infrastructure of the College is robust enough to support all the services that run on top of it. The main networking infrastructure of the college was last refreshed in the 2013-14 academic year. This equipment should be upgraded and replaced by 2022 and no later than 2025. Additionally, growing demands on the network will necessitate further expansion – as of March 2019 the edge switches almost at 100% capacity.
    5.1.1   Edge Switch Refresh to enable 10GB to endpoint
    5.1.2   Remodel of network closet locations that do not current meet performance and security requirements
    5.1.3   Fiber backbone replacement to allow for 40GB backbone
5.2 Internet Bandwidth increase from 500MB to 2GB
5.3 Firewall Replacement
5.4 Core Switch Replacement
5.5 Server Isolation Switch

Funding Request

Goal/Objective	2020-21	2021-22	2022-23	2023-24	2024-25	Total
1.1 Expand Wireless Density	1,000	1,000	1,000			3,000
1.2 Improved Wireless Access Management	17,000	4,000	4,000	4,000	4,000	33,000
1.3 Replacement/Update of Wireless Hardware					350,000	350,000
2.1 Classroom Technology Modernization	220,000		220,000			440,000
3.1 Cloud Academic Software Labs	10,000	10,000	10,000	10,000	10,000	50,000
3.2 Refresh of Academic Computers	296,400	33,000	91,200	106,800	26,400	553,800
3.3 Refresh of Specialized Computing Labs	30,000		30,000			60,000
4.1 Standardized Integration Toolset	20,000					75,000
4.2 Increase use of Analytics for Decision Making	15,000	15,000	15,000	15,000	15,000	75,000
4.3 Increased use of electronic forms (licensing)	10,000	10,000	10,000	10,000	10,000	50,000
4.4 Refresh of administrative computers	68,000	55,200	55,000	46,000	39,000	263,200
5.1.1 Edge Switch 10 GB upgrade			210,000			210,000
5.1.2 Network Closets Improvements			40,000			40,000
5.1.3 Fiber Backbone 40GB upgrade			25,000			25,000
5.2 Internet Bandwidth Increase to 2GB	8,000	8,000	8,000	8,000	8,000	40,000
5.3 Firewall Replacement					80,000	80,000
5.4 Core Switch Replacement			80,000			80,000
5.5 Server Isolation Switch	15,000					15,000
	$710,400	$136,200	$799,200	$199,800	$542,400	$2,388,000

Appendix A: Student Survey Instrument

Survey was conducted between November 2017 through the end of the semester. Invitations to participate were sent to all enrolled students via email as well as a advertised link on myTC3. Note that the choices in question one were presented in random order in the online version. The survey received 107 responses.

1. Please order the following technology services from most to least important to you:
   - ☐ Smartphone Applications (TC Connect / Blackboard)
   - ☐ Digital Course Materials including OER (Open Educational Resources)
   - ☐ College Email
   - ☐ Text (SMS) to/from College
   - ☐ Online Career Exploration
   - ☐ Video Lectures
   - ☐ Open Use Student Computers
   - ☐ Online Library Databases
   - ☐ Online Tutoring Services
   - ☐ Wireless / WiFi

2. What technology do you depend on the most to be a successful student (does not need to be in the above list)?

3. What technology service(s) do you wish TC3 offered students?

Appendix B: Instructor-Classroom Survey Instrument and Findings
Survey compiled April-May 2019 with 39 respondents.
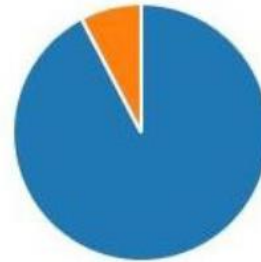
1. **What is your primary classroom?**
   [Various responses]
2. **Does the current classroom technology align properly with your course design?**

Does the current classroom technology align properly with your course design?

More Details

● Yes   36
● No   3

3. **Is there a room that you avoid because you do not like the technology?**
   [Responses contributed to developing Goal 2 classroom list]
4. **What technology are we missing that you would you like to see in your classroom?**
   [Highlighted Responses, smartboards was the most common response – wi-fi issues second most mentioned]
   a. Since I teach English, I basically use the overhead projector and audio, and those are in all rooms, so I'm happy with the configurations.
   b. Better Wi-Fi accessibility. Many times the Wi-Fi is spotty in that classroom
   c. Upgrade for the classroom is it in a 5-year cycle? (Yeah I know we are in tough budget times)
   d. Sometimes a Smartboard would be nice, but not necessary.
   e. So far, all the rooms I've been in have had adequate technology.
5. **Which technology option would serve you best if you could only pick one?**

● More Software   2
● Document Camera   4
● Projector   5
● Flat Panel UHD TV   1
● Mobile Device   0
● Faster Computer   7
● Interactive Whiteboard   5
● Mobile Furniture   2
● Whiteboard   3
● Clickers (student feedback in...   2
● Distance Learning Equipment   1
● Other   5
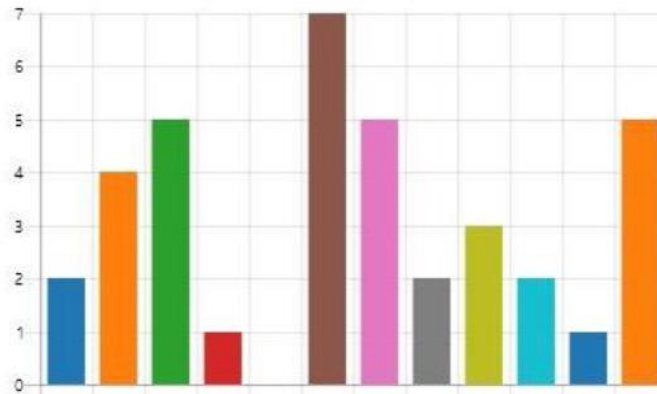
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