



Technological Trends  
Workgroup Paper  
Recommendations for the Strategic Planning Committee

March 2013

**Introduction**

Yogi Berra once said, "The future ain't what it used to be." When it come to the educational scene, that couldn't be more true today. Students want access anywhere, anytime, anyplace and on any device. They expect the education to be meaningful, engaging, personalized, and instantaneous. And their educational experiences must grow their 21st Century Skills-communication, collaboration, critical thinking, and creativity. We are in an era where our students must be critical thinkers, lifelong learners, and creators of content not just consumers of information. Our goals should be to prepare students to be lifelong learners as well as knowledge workers for 21<sup>st</sup> century workplace which will undoubtedly be infused with technology.

The Technology Trends workgroup identified technology trends that are and will impact our university now and into the future. Many of these trends are already being supported on campus and much of the technology infrastructure to support these trends is already in place. Continued monitoring and support of this infrastructure is of utmost importance considering how quickly the technology landscape is changing. Overall, this workgroup finds NKU well situated to embrace the near and future tech needs of our students, faculty, and staff.

This report summarizes our work which includes background information, resources, and recommendations.

Our work was informed by reading the articles collected and posted to Blackboard and the strategic planning website, data from IR that pertained to technology, three years' worth of IT student surveys, and results of the recent IT Open Forums with faculty, staff, administration and students. Also, knowledge from the various members of the workgroup who have experience in technology and its application as well as insights gained from technology conferences and groups (e.g., EDUCAUSE, Gartner, etc.) were brought into the deliberations. The committee met weekly to discuss issues related to technology trends and to identify trends that we feel the university should pursue. In our last two meetings, we worked through our recommendations that are in this paper.

NKU needs to be a Digital University. In a digital university best technology practices are applied at all levels of the university to support the mission and improve efficiency and effectiveness. Success in meeting this goal requires:

- infrastructure support
- buy-in from all stakeholders
- training and support
- communication

For the purposes of this report, the digital university can be broken into three areas: resourcefulness – efficient and effective use of resources; technology in academics - supporting student success; and innovation – fostering a spirit of innovation and creativity moving into the 21<sup>st</sup> century. The key concepts to support the digital university are:

- immediacy – everything, anytime, anyplace, anywhere
- intimacy – individualized, customized, personalized
- transparency – support, integration, buy-in, fact-based, prioritized
- flexibility – rapid, ever-changing, adaptable

## Findings

The workgroups recommendations are divided into three areas. Each area has numerous mechanisms or technologies available. We enumerate these and discuss issues related to them.

### **Resourcefulness – efficient and effective use of resources**

NKU needs to expand its resources and optimize administrative, instructional, and operational processes to be more efficient and effective. We should ensure that technology expenditures are made wisely. This can be done by deploying technologies that improve services by streamlining and simplifying operating processes. Prudent resource management and elimination of unnecessary duplication should also be adapted. One example is a proposal to utilize Blackboard to eliminate the current paper RPT binders for faculty. Here existing technology can provide easier access to documentation for stakeholders thus making the process more efficient in going “paperless” and effective in timeliness of access for committee members.

We believe the following technologies are among those that NKU should invest or continue to invest in:

- Cloud/Virtualization/Access – By utilizing cloud technologies and virtualization, NKU gains efficiencies through energy savings and resource savings (e.g. offsite data storage, hardware, etc.) which reduces our overall carbon footprint. In addition, it provides anytime, anywhere access to NKU resources from any type of device (e.g. laptop, tablet, smart phone, etc.) which allows NKU faculty, staff and students to accomplish their tasks whether they are in the office, classroom, conference room, on campus, or off campus. The university has already invested in virtualization and provides access anytime, anywhere through VPN, virtual desktops, and network infrastructure. NKU student email has also been moved to the cloud and provides NKU students with a lifetime email account. We anticipate that the university will need to continue to invest in this infrastructure as we expand cloud and virtualization services to include such things as faculty/staff email, data storage for analytics, enterprise-level cloud storage, additional mobile technologies and software to support business and/or academic processes and best practices. We should explore a university site-license for cloud software such as Office 365 and Adobe Creative Cloud.
- Paperless – By utilizing cloud and virtualization services, the majority of our work can be accomplished without printing. This is true for faculty, staff and administration with respect to meetings and committee work and equally true in many classes where assignments are posted and student responses are submitted electronically. When feasible, NKU should support and promote further reduction of printing through better utilization of technology. For instance, any

process still manually generated on paper with a physical signature should be reviewed for a workflow solution and digital signature. Faculty should also be encouraged to accept electronic assignments whenever possible. For the 2012 academic year, the Printing Commitment Item (550205 Printing) shows an expenditure of approximately \$1M. Reduction in printing costs at all levels would allow the university to reallocate funding to other areas as needed.

- Analytics (e.g. big data, data mining, etc.) – Data-driven decision-making should be the norm but to make this a reality the university should educate all departments in what analytics can do and how we can apply the available tools to perform data mining and analyses. From a business perspective, we might investigate such information as trends from our student population to understand what and how we should offer classes. Predictive analytics can be used for forecasting course demand. Another benefit of analytics is the ability to provide administration with real-time or near-time dashboards that compare various events to internal metrics as well as state metrics. These types of events can range from student pipeline, enrollment data, retention data, to budget and expenditures. To facilitate analytics, NKU should make data available at the elemental level when possible and at the manipulative categorical level at a minimum. Accurate data definitions will be required to ensure that these dashboards and business management tools provide a realistic picture of NKU activities. Institutional training on basic analytics will also be necessary in order to obtain maximum benefit. Additional research is needed into potential business intelligence tools and database accelerators such as Business Objects, and HANA.
- Communication – NKU needs to find the best way to communicate information to students, staff, faculty and administration. We currently find ourselves in a situation where students receive information from the university in many forms including email, Twitter, Blackboard, websites, etc. These multiple methods of communication lead to inconsistency and perhaps an overwhelming amount of information especially for students. Communication between administration and faculty/staff needs to improve in an effort to support transparency. In addition, we need to improve the awareness of what technology can do for everyone and promote best practices by sharing information, ideas, and resources more freely. For instance, many faculty are unaware of the virtual labs and what can be accomplished with them. The education of communication tool functionality should be continued. In addition, the structure of communication should be addressed. For example, topics such as report formats, information completeness, email options, etc. should become part of employee development through proper training.
- Collaboration – As the campus grows locally and globally, it is increasingly important to keep channels of one and two way communication open. Collaboration across divisions of the university working together toward a set of shared goals will improve buy-in from stakeholders which leads to successful implementations and adoption. The effective use of technology based collaboration tools such as Blackboard organizations, SharePoint, WebEx can be a tremendous asset. Such collaboration should be encouraged and supported by the administration.
- Integration of services – As new technology and software solutions are investigated, thought should be given to implementation processes such as requirements analysis; adequate, timely training; ongoing technical support; upgrade practices; etc. Integration between systems should be easy to implement and transparent to the end-user. In addition to new technology solutions, current business processes should be investigated to more fully utilize myNKU ERP system integrations to improve operational efficiencies. A well-documented plan should be in place for all system purchases, upgrades and system integrations. Many NKU decisions impact technology so IT should be involved to ensure that requirements can be met, etc. To that end, the workgroup recommends that hardware and software purchases be approved by the Information Technology Advisory Council or the IT executive team to ensure that said documentation plan is in place.

- Consistency for stakeholders – NKU should develop more standards that promote best practices across all divisions of the university including teaching and learning. For instance, better utilization of workflows and integration of systems will provide consistency across divisions. This can partly be done through training. The workgroup recommends that training should be encouraged for all users whether it be faculty using Blackboard or staff using myNKU. Training should also be tied to performance reviews.
- Mobile technology – Should the university adopt a “bring your own device” (BYOD) policy for students? This is a controversial topic as many students may not be able to afford such a device or desire to bring it to school every day. If we support a BYOD initiative, then we need to ensure that faculty will have students use the technology in and out of the classroom to make it worthwhile. For students who cannot afford the technology, there are several possible approaches that the university could adopt. First, we could have a lending library. Second, we allow students to purchase the devices as part of their tuition and fees. Third, we could seek external funding to support the purchase of devices that we can issue to students as a scholarship or we could to continue to support and utilize the physical computer labs to a greater extent. Faculty buy-in will be needed to ensure that, if we adopt BYOD, students utilize the technology often enough to make it worthwhile. The Information Technology Advisory Committee’s (ITAC) Hardware Subcommittee is working on a recommendation and memo regarding a BYOD initiative for NKU. This recommendation should be available late Spring 2013.
- Web presence and social media usage – NKU needs to improve both our web interface and our ability to use social media. Without these, we are not reaching prospective students as well as other universities. Our website also needs to be mobile-friendly. Prospective students are more likely to click on a link in an email from their mobile device than any other device. NKU’s web presence and social media usage not only impacts student recruitment but also affects retention. Research shows that one in five students indicated that they removed a school from consideration because of a bad experience on an institution’s web site.
- Media production – NKU needs to improve our presence in the region through marketing and broadcasting including dissemination of what NKU is all about, our success stories, advertising, streaming of live events, etc. The ability to have well-designed commercials and advertisements is a necessity for recruitment. There is an increased demand on our current media production team related to Division 1 athletics and broadcasting games. Additional resources including equipment, bandwidth and personnel are needed in this area in order for NKU to be at minimum equal to our peers in this area.
- Continued investment in myNKU – The workgroup feels that NKU needs to continue to invest in further improvements to myNKU. Greater efficiency can be gained through optimization of the system. More work needs to be done to make current data readily available as indicated above. Degree audits can provide for more efficient and effective student advising, etc.

### **Technology in academics**

Central to the university’s mission is the support of academics and our students’ success. Technology, when used correctly, can be a tool to improve student success and retention. Here, we examine technologies available to potentially support student success and retention.

- Analytics (e.g. big data, data mining, etc.) –

*“Learning analytics is the use of intelligent data, learner-produced data, and analysis models to discover information and social connections, and to predict and advise on learning”* George Siemens

As stated above, NKU can apply data mining and other forms of analysis to improve our business model. Learning Analytics is an emerging field in academics which helps target instructional, curricular, and support resources to support the achievement of specific learning goals. Student-related data can be used to identify at-risk students in efforts to improve student retention as well as build better pedagogies, indicate areas for improvement (both for the student and within the course) and assess the effectiveness of programs. In addition, analytics software can be used to make the advising process more efficient and accurate. For instance, predictive analytics can be used to help students choose courses that might be of interest to them. The workgroup recommends that a team be formed that can analyze existing student data and determine what other tools if any are needed for NKU to be able to draw conclusions from said data.

- Mobile Learning & BYOD – With the proliferation of mobile devices, NKU needs to continue to invest in mobile learning. As mentioned earlier, NKU needs to decide if BYOD is right for us. We also need to ensure faculty buy-in and provide faculty with the needed support to creatively incorporate mobile devices into their coursework. In an effort to ensure faculty buy-in, additional training and support is needed for the integration of mobile devices in the classroom. The ITAC Mobile Technology Subcommittee is working on plans for an NKU App Store where ideas and classroom integration techniques can be shared amongst colleagues.
- Labs – NKU students are able to access many commonly used NKU lab software applications from their personal devices from anywhere by utilizing the NKU Virtual Computer Lab. We need to better disseminate to the faculty that these labs are available so that they can be used more effectively across the university. We should also investigate if virtual computer labs could replace current “in class” activities, whether that is through out-of-class assignments or by moving some classroom activities to the virtual computer lab. In the latter case, for instance, can some labs be done through simulation? If so, this might reduce costs and free up space to accommodate a greater number of students in the physical labs. When using virtual labs is not possible, there should be a reliable and sustainable process for lab computer replacements and software renewals.
- Alternative delivery methods – Today, we see a number of different delivery methods being employed across academia including MOOCs, online classes, blended/hybrid classes and flipped classes. Many students preferred blended-learning environments according to the ECAR Study of Undergraduate Students and Information Technology. We need to study these approaches to provide guidance for academic units in how to best use these approaches. We need to study the impact that these approaches might have on student success and retention, and how these might alter our current business model. For instance, should we accept MOOC credit and if so, how much should apply? Should the university offer MOOCs either to our own students or to the general populace? If the university chooses to support these alternate delivery methods, it needs to support faculty in their development. For instance, reassigned times might be offered. Additionally, the university needs to provide some mechanism for quality assurance to ensure that alternative delivery methods are provided in a pedagogically sound manner and that the altered courses equally meet student learning outcomes as traditional course delivery. The workgroup recommends that an advisory group be formed that can determine whether an alternative delivery method is appropriate given the course material (e.g., problem solving courses like those in mathematics and computer science may not be amenable to the on-line delivery, a course in writing may not be amenable to a flipped style). This advisory group should be comprised of faculty, students, administrators, and technology experts. This advisory group might base their decision making using Quality Matters (<http://www.qmprogram.org>) or some similar standard.
- Communication with students – NKU needs to improve communication with our students. Many students are requesting a single mechanism to receive all messages. Suggested

technologies include utilizing a single sign on “portal-type” site that would provide access to Blackboard, NKU email, myNKU and other NKU resources from a single site. This site would also allow students to receive customized messages that are targeted to their interests and needs. In addition, this site could allow students to receive said notifications to their mobile device or social media network.

- Textbooks/eText – Better utilization of eText and other online resources could drastically reduce the cost of attending college for many students.
- Personalized learning – As stated earlier, there is an increasing demand for education that is customized to each student’s unique needs. These new technologies provide more learning choices and allow for differential instruction. This is an emerging field that should be more closely examined to see how learning analytics will enable the development and adoption of additional technologies that facilitate personalization.
- Consistency – As indicated above, NKU should develop more standards that promote best practices across all divisions of the university including teaching and learning. For instance, not all faculty use Blackboard and those who use it tend to use it in different ways. For the students’ convenience, a standard format would help them more easily access course content so that they can spend the majority of their time on the content and not trying to access it. Similarly, students report that they would like a uniform mechanism for communication.
- Information/Computer Literacy – If NKU continues to provide access anytime any place, offer more courses using alternative delivery methods and support BYOD, then we need to ensure our students are prepared to use standard technology. We should also ensure that students are information and computer literate to help them succeed in college. Toward that end, we recommend that all students take either a computer literacy course or an online module which covers the necessary material to educate them on information and computer literacy in general and those technologies used specifically at NKU. These skills will also be invaluable to them as they continue their NKU college career and enter the 21<sup>st</sup> century workforce. We would recommend that students take this course/module; upon being accepted at NKU; or during their first two semesters at NKU or as a prerequisite to any online or hybrid course.
- Accessibility – Accessibility not only refers to anytime, anyplace, any device but also to anyone. We need to ensure that course content, websites, etc. is readily available to everyone which includes following ADA guidelines.

## **Innovation**

With increasing pressure from MOOCs and the changes in academia with respect to personalized learning, the workgroup recommends that NKU embrace innovation from top to bottom of the organization and move toward creating a culture of innovation. In many recent studies and articles on innovation, it is strongly suggested that the culture of innovation is the main reason for successful technology innovations within organizations. Successful organizations take a systematic approach in fostering creativity and innovation at all levels of the organization, not focusing only on special projects or teams. The work group recommends that NKU find a systematic way to solicit ideas from everyone in the organization and create an atmosphere of empowerment that allows everyone to take risks and innovate within their own sphere of influence. This will ensure that innovation becomes a sustainable endeavor of the university in the future.

NKU needs to support workgroups willing to explore new business practices, new pedagogical approaches and technology. We should invest in the exploration, implementation and support for mobilization and emerging technologies that increase recruitment, retention, and graduation rates and to improve teaching, learning, training, and workforce development to meet the needs of the 21st century workforce. Here, we expand more on innovation:

- Exploration of emerging technologies – The workgroup recommends that the university support the exploration of emerging technologies by forming workgroups to work collaboratively across constituents to create new business practices that are sound and which will appeal to students of the 21<sup>st</sup> century. For instance, we might look to offer on-demand courses rather than scheduled courses. We might alter our curricula from course-based to content-based or competency-based.
- Support of new pedagogical approaches with technology – We are currently working to implement “classrooms of the future” for several colleges on campus. Faculty from each college, are providing information regarding the types of technologies that they envision using in the classroom. This process ensures that these technological tools work in the given content area. Faculty are asked to generate ideas that are both pedagogically sound and capable of supporting the particular content that the particular program(s) is to deliver. Having these faculty members in the departments helps with buy-in from other faculty. We need faculty to embrace the use of technology to alter course delivery methods such as through flipped, hybrid or online courses. We also need to support faculty in the development of materials for such delivery by expanding the role of our instructional designers. In addition, we should provide better faculty support such as through reassigned time and/or via performance review mechanisms (e.g. annual performance review, tenure, and promotion). Additionally, the university needs to ensure the integrity of such courses through quality assurance such as Quality Matters which was previously mentioned.
- Communication – We need to improve lines of communication at all levels of the university so that we can share innovations and opportunities. We already have a number of such mechanisms – news releases and the Provost’s News for Now, News from IT, the annual faculty workshop, *Meet Greet and Grab a Seat*, TEEC workshops, CITE workshops, etc. However, we still find that much information does not get disseminated clearly or in a timely manner.

## Conclusions

One of the constant themes in the discussion was an appreciation for the IT resources that are committed to serving the academic needs of students far better than any other institution we know of. This is, we believe, due in large part to the commitment of NKU to house IT in the academic chain of command. This is an innovative approach that has provided us with a significant lead over much of our competition. The workgroup believes that the bar is high for where NKU needs to be in regards to technology and the funding model should follow appropriately. To that end, the work group finds that the university has already invested in infrastructure to support the concept of a digital university.

Moving forward, we need to better utilize existing resources to improve on efficiency and effectiveness. Technology investments should support the university’s mission. Stakeholders should be involved at all levels to ensure buy-in which leads to successful adoption. Well thought out implementation plans should be developed that help ensure success should be required for all projects. For example, all users should be encouraged if not required to attend trainings as new technologies are implemented and the trainings should integrate with the ongoing operations of NKU. Better communication across all areas is needed. Adequate support for implementing and using technologies is also needed. Quality assurance measures should be put into place to ensure that as new delivery methods are explored and implemented that there is no compromise or degradation of course content. We also need to explore innovative business practices.

The specific recommendations and possible action items from the technological trends workgroup can be summarized as follows:

- Study how technology and delivery methods impact student success.
- Ensure the quality of our courses as they utilize different delivery methods.
- Examine how to support BYOD and forthcoming recommendation from ITAC subcommittee.
- Develop an online module that teaches students how to use specific NKU technologies as well as basic computer literacy and require that all students complete the module.
- Support the integration of technology into our curricula through reassigned times and/or via performance evaluation mechanisms (e.g., recognized in annual performance review, tenure, promotion). For example, an NKU Best Technology Use in the Classroom Award.
- Continue to support IT/CITE so ample resources are available to assist faculty with integration of technology in the classroom utilizing various delivery methods, provide integrated technology training for faculty, staff, and students as well as nurture and support innovation.
- Encourage faculty to increase the amount of virtualization used in our classes to optimize the classroom and increase efficiency when possible but also fully support standardization of equipment in physical labs that cannot be virtualized.
- Provide additional resources for media production to support marketing/public relations, athletics and departmental usage needs.
- Catalog the available technology and provide training and support for said technologies. This includes documenting how the technologies are being used. Encourage all users to attend technology trainings. Training attendance should become part of the annual performance review.
- Utilize existing data to its fullest through analytics in support of improved or altered business practices and changes in our delivery approaches allowing access to data whenever feasible.
- Improve communication between administration, faculty and staff, and between the university and our students.

## References

ECAR Study of Undergraduate Students and Information Technology, 2012. Retrieved from <http://www.educause.edu/library/resources/ecar-study-undergraduate-students-and-information-technology-2012>

Gartner Education Hype Cycle 2012 (attached)

NMC/EDUCAUSE Horizon Report, 2013 Higher Education Edition. Retrieved from <http://www.nmc.org/publications/2013-horizon-report-higher-ed>

2011 E-Expectations Report: The Online Expectations of Prospective College Students and Their Parents. Retrieved from [https://www.noellevitz.com/documents/shared/Papers\\_and\\_Research/2011/2011\\_E-Expectations.pdf](https://www.noellevitz.com/documents/shared/Papers_and_Research/2011/2011_E-Expectations.pdf)

Jaggars, S. (2011, March). Online Learning: Does It Help Low-Income and Underprepared Students? Retrieved from <https://strategicplanning.nku.edu/content/dam/StrategicPlanning/docs/OnlineEducationandInnovation/online-learning-help-students-brief.pdf>

Linkner, J. (2011, June 16). 7 steps to a culture of innovation. Inc. Retrieved from <http://www.inc.com/articles/201106/josh-linkner-7-steps-to-a-culture-of-innovation.html>

Ng, A. (2013, January 24). Learning from MOOCs. Retrieved from <http://www.insidehighered.com/views/2013/01/24/essay-what-professors-can-learn-moocs>



Walsh, K. (2013, January 30). MOOC2Degree Initiative Raises the For-Credit Profile of MOOCs. Retrieved from <http://www.emergingedtech.com/2013/01/mooc2degree-initiative-raises-the-for-credit-profile-of-moocs/>

### **Workgroup Membership**

This workgroup consisted of xx members from various departments and units across the campus.

Members included:

<b>Name</b>	<b>Title</b>	<b>Department</b>
Mark Wasicsko, Facilitator	Dean	College of Education and Human Services
Richard Fox, Recorder	Faculty	Department of Computer Science
Sarah Mann, Principal Writer	Director	Information Technology/CITE
Chris Bowling	Manager	Student Union Administration
Denise Robinson, SP Committee Liaison	Dean	College of Health Professions
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Kathleen Cox- Barker	Early Alert Specialist	Student Achievement Center
Tim Ferguson	Associate Provost/CIO	Information Technology
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