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	Vote	Adoption Horizon		
		12 Months	2-3 Years	4-5 Years
1. What would you list among the established technologies that colleges and universities should all be using broadly today to support or enhance teaching, learning, or creative expression?				
▪ **Ubiquitous networks** – not just wireless, but also high-speed networking, and especially high speed networking to rural areas, via power lines. Since the current broadband system isn't serving everyone, community networks are emerging. Should we encourage people to think of the Internet as a utility that is necessary for education, commerce, and a productive life? *(Diana Oblinger)* Might push this further ahead in time. New Pew study finds broadband adoption nearing a plateau, after barely 1/2 of Americans signed on *(Bryan Alexander)* One research effort at Dartmouth on wireless: Center for Mobil Computing *(Malcolm Brown)*	XXXXXXXX XXX	XXXXX	XXXX	
▪ **Grid Computing and eScience** – the ability to easily move and share large data sets, and to put authentic data in the hands of students could be transformational. We are already seeing that happen with scientists. Why not extend it to learners? *(Diana Oblinger)*	XXXXXX		XXXX	X
▪ **RSS** – Has done much to foster individual expression – but we are only beginning to tap it for learning *(Diana Oblinger)* — Also, syndication of more then text content (images, audio, video) and tech to mix feeds from multiple sources into something new *(Alan Levine)*	XXXXXXXX XXXXX	XXXXX	XXXXX	

	Vote	Adoption Horizon		
		12 Months	**2-3 Years**	**4-5 Years**
▪ **video production and sharing** - this has become much easier, and is already exfoliating into numerous delivery mechanisms (DVD, vlogging, OurMedia) *(Bryan Alexander)*	XXXXX	XXX	XX	
▪ **audio production and sharing** - see video preceding. Think of connections with other technologies, such as syndication (podcasting) and mobile devices *(Bryan Alexander)*	XXXXX	XXXXX		
▪ **Torrent technology** putting it to educational use? *(Alan Levine)* See also IP issues, below *(Bryan Alexander)*				
▪ **net documents** shared writing environments, documents that live on the network, not the desktop e.g. wikis or web apps like WriteBoard Writely , SyncroEdit *(Alan Levine)*	XXXXXXXX	XXX	XXXX	
▪ **web applications** web-based software see examples above under net documents plus ThinkFree or project planning tools like Basecamp , BackPack *(Alan Levine)*	X		X	
▪ **web standard content creation tools** It's time to stop making content not up to modern web standards that can be used on multiple devices, address accessibility *(Alan Levine)* Does this include microcontent? *(Bryan Alexander)*				
▪ **Narrowcasting** e.g screencasting audio recording captured over screen action; to do more than just explain how to use software, but to deliver advanced concepts *(Alan Levine)* Along with podcasting and vodcasting, and now appcasting and no doubt other types of 'object' casting to come. *(Nick Noakes)*	XXXXXXXX X	X	XXXX	XX
▪ **folksonomic tools** del.icio.us and Flickr - among others - are more than mature enough for use in academic environments. The possibilities for new ways of sharing, aggregating, and organizing information are endless. *(Ruben Puentedura)* e.g. Scuttle open source social bookmark tool… I am a fan of the technologies but not convinces these are anywhere near acceptance on campuses *(Alan Levine)*	XXXXXXXX	X	XXXXX	

	Vote	Adoption Horizon		
		12 Months	**2-3 Years**	**4-5 Years**
Wikis like this (excellent) one for the Horizon Project *(Jean Paul)Malolm:* seems to overlap with net documents; since the former is a broader concept	XXXXXXX XXXX	XXXXXX	XX	
▪ **Multimedia Aggregators** some examples are FireANT, DTV, iPodder, iPodderX (etc), Attensa (links into FireFox and IE and resides within Outlook) *(Nick Noakes)*	XXX	XX	X	
▪ **VOIP + API's** - Internet phone + add-ins that could really impact on both informal and formal, peer-to-peer (P2P) learning. Skype, Gizmo, iChat, etc with tools that allow you to record audio and video and also to stream content to each other while connected via the VOIP tool. See ShowMacster for iChat as an example of this. Skype recently released their API so expect something similar to ShowMacster to be out and widely used before next Jan. *(Nick Noakes)* And other tools that promote/support interaction and collaboration within groups (including more than just student groups; i.e., faculty, staff, administration) *(Sue Bauer)*	XXXXXXX	XX	XXXXX	X
▪ **Increased enterprise application integration** – both intra-campus as well as inter-campus. As the enterprise-level tools aggregate (e.g., CMS, eportfolio, SIS, library, portal) they need to continue to be integrated and seamless to enable more all-digital learning engagements. These same tools need to be able to reach across institutions to enable content acquistion etc. (example: Twin Peaks) *(Malcolm Brown)* CMS use for courses, committees, communities of practice *(Joeann Humbert)* These tools also need to be "open" in at least two ways: they need to be open to accommodating connections and interactions with tools such as mentioned above (e.g., Skype, Flickr, Google's various projects), and they need to be open to importing and exporting content (vendor lock-in is no fun...) *(Ruben P)*	XXXXX	X	XXX	X

	Vote	Adoption Horizon		
		12 Months	2-3 Years	4-5 Years
▪ **Smart ID cards** - for vending, meals, etc *(Joeann Humbert)* and library, computer labs *(Sue Bauer)*	XX	X	X	
▪ **Self-serve hi speed print centers** - for course packs, theses, in departments, dorms, eg., 200 pages free per day *(Joeann Humbert)* and computer labs *(Sue Bauer)*				
▪ **Video Cams** - for all faculty computers for conferencing, office hours *(Joeann Humbert)*				
▪ **Course Management Systems and e-Portfolio Systems** - such as WebCT, BlackBoard, ProfPort, home grown varieties *(Sue Bauer)*	XX	XX		
▪ **Digital Archive Tools** - Metacat *(Sue Bauer)*				
▪ **Large Screen Video Display Technologies** - collaboration begins around the camp fire. Today's camp fire is the large flat panel LCD/Plasma screen. Where there are installed, and the local surrounding made to support students working together, positive things happen. *(Phli Long)*	XXXX	X	XXX	
▪ **Blogging** - it has certainly moved past the novelty technology to something more broadly supported; or substitute other technologies for student created expressions (eportfolios) that exist *outside* the bounds of class sites. *(Alan Levine)*	XXXXXXXX X	XXXXXXXX		
▪ **Personal Portable Devices** - The Duke iPod experiment may not have marked a sea change in the delivery of instruction but it has shown the importance of using simple, well designed devices and software interfaces to them (iTunes) as search, retrieval and display/play tools that apply to all digital content. What will Apple announce on 10/12? Apple Announcement *(Malcolm Brown)* New rumors claim it's a video iPod *(Malcolm Brown)*	XXXXXXXX XXX	XXXXXX	XXXX	X

	Vote	Adoption Horizon		
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▪ **XHTML - remix/restructure content for teaching and ...** - Simple dynamic HTML scripts can take content from external sources and add to them, restructure their presentation or otherwise creatively remix them to add value otherwise missing. GreaseMonkey plugins to Firefox and some creative scripting mixed together and voila, GeoTagging is born. See Geoblogger *(Phil Long)*				
▪ **Web Services**- achieving the Web 2.0 dream of a wide variety of distinct applications for learning that to the user are relatively seamlessly woven together requires agreeing on the data structures and serving them up as web services. From the trivial but powerful (see Amazon Light 4.0 - note the "is it in your library?" link - to the more comprehensive demotion of the current bloated CMSs to become modular sets of learning tools sewn together via webservices, this needs to happen now. *(Phil Long)*	XXXXXXXX	X	XXX	X
▪ **Device Ubiquity and Podcasting**	XXX	X	X	
▪ **Social Computing**				
▪ **CMS** and integration into ERP environment	X	X		
▪ **Closed/Proprietary systems** (higher ed DBs not available to graduates);				
▪ **Blogging**	here twice			
▪ **IM**	X	X		
• **Killer Maps** Google, Microsoft, and Yahoo are vying to transform online maps into full-blown browsers, organizing information via geography.	XXXXX	X	XXX	

	Vote	Adoption Horizon		
		12 Months	**2-3 Years**	**4-5 Years**
• **Mesh Networking** Meshes will be the mechanism by which machine intelligence becomes like electricity: invisible and ubiquitous.	X		X	
• **Broadband Over Power Lines** The emerging field of BPL – broadband Internet access over common power lines – is nearing some large-scale rollouts.	XX		XX	
• **The Hundred-Dollar Laptop** MIT's Nicholas Negroponte wants to provide Internet access to all the world. His plan: a dirt-cheap computer.	XXX X		XXX X	
• **Google Maps Tinkerers Make Demographic Data Come Alive** Industrious individuals are using Google's powerful mapping service to assemble visual information on everything from high-crime areas in cities to apartment rentals.	w/ killer maps			
• **Google Maps and GeoBlogging** With the combination of Google Maps, Firefox, GreaseMonkey's plugin for running XHTML scripts and Flickr, you can place you photos on the map!	w/ killer maps X	X		
• Place-based services (integrating location context in services)	XX	X	X	

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		Adoption Horizon		
	Vote	**12months**	**2-3 Years**	**4-5 Years**
2. What technologies that have a solid user base in consumer, entertainment, or other industries should colleges and universities be actively looking for ways to apply?				
▪ **Cell phones and other mobile devices** – Cell phones and mobile devices are moving faster than many other technologies. With TV appearing on cell phones, and other tools, what are the educational applications? with much improved software, video & Flash capability, plus social interaction tools, (SMS, chat) much might be possible. *(Diana Oblinger)* Concur, Cell Phones dominate student communications. Services emerging that provide "channels" of information that are accessed through common cell phones using mobile Internet browsers and text messages.*(vincent doogan)*	XXXXXXXX XXXXXXXXX XXXX	XX	XXXXXXXX XXX	
▪ **Virtual Groups and Collaboration** – these tools are very widely used in business, and their ability to support distributed work and processes is improving all the time *(Diana Oblinger)*	XXXXXXXXX XXXXX	XXX	XXXXXX	
▪ **3-D Scans and Projection** – these hologram-like tools increasingly allow visualization of context *(Diana Oblinger)* - and 3d printing *(Bryan Alexander)*	XXXXXXX		XX	XXX
▪ **Tivo** Apply same principle to educational content, ability to capture learning, timeshift?? *(Alan Levine)* Tivo is changing the way advertisers think about getting their message out *(Diana Oblinger)*	XXXXX		XX	XX

	Vote	Adoption Horizon		
		12months	**2-3 Years**	**4-5 Years**
• **Digital gaming** - a domain which already defines a generation, constitutes a global industry, and has transformed media literacy, with no signs of stopping. New forms, fluencies, communities develop rapidly. *(Bryan Alexander)* Also, maybe rise of game console/media center as educational tech platform. *(Alan Levine)* Distributed, multi-player games will give students a taste of the global, multinational interactions they're likely to be involved in when they enter the workforce. Also, tie with Virtual Groups above. *(Richard Baraniuk)*	XXXXXXXXX XXXXXXXXX		XXXXXXXXX	XXXX
• **Instant/Text Messaging** move from class annoyance or add-on to applied use, perhaps usurp email as primary communication tool *(Alan Levine)*	XXXXXXXXX XX	XXXXXXX	X	
• **PodCasts** - the ease of capturing MP3 audio (see the iRiver N-series recorder/player) the option for a student to hear the lecture their faculty gave in class should be easy to scale and ubiquitously available. *(Phil Long)* And let's go beyond one way broadcasts- more on practice and tools for students contributing audio content, perhaps an audio form of a wiki? *(Alan Levine)* Our NYU Medical Center/ NYU School of Medicine, Continuing Medical Education using Podcasting via Web and within Apple iTunes. *(vincent doogan)*	XXXXXXXXX XXXXXXX	XXXXXXXXX XXXX		
• **Metadata search** - if one knows when, how and/or where information is created it will greatly simplify searches in this continuously increasing flux of information. This applies nicely to college courses, homework, illustrations, etc. *(Jean Paul)* *And not just metadata. Searching that can examine actual content and comments seems to be where things are headed when it comes to finding something. It's the Google desktop; also Apple's Spotlight. Microsoft's Vista will arrive with a Spotlight-like mechanism. (Malcolm Brown)*	XXXXXXXX	X	XX XXX	
• **Active Community Driven Social Networks** - Craigslist for education?	XXXXX		XX	X

	Vote	Adoption Horizon		
		12months	**2-3 Years**	**4-5 Years**
• **Blogs** - opportunity for public presentation of thoughts *(Joeann Humbert)* and something with more permanance then a course management system which evaporates every six months, e.g. idea of a digital backpack for life *(Alan Levine)*	XXXXXXXXX XXXX	XXXXXXXXX	X	
▪ **eBay, Amazon** - for used books, books, school supplies *(Joeann Humbert)* or maybe a Netflix approach? Also [Peerflix] a new service for trading DVDs by posting "haves" and "wants" *(Alan Levine)*	XXX	X	XX	
▪ **ATM like podiums** - for Bursar, Registration, event tickets, etc *(Joeann Humbert)* and make them accept Bluetooth? *(Alan Levine)*				
▪ **GPS units** - coordinates for rooms, parking lots, directions *(Joeann Humbert)*	XX			X
▪ **Mobility pseudo-devices** such as projection keyboards, ie, keyboards projected by small boxes onto any surface where one can do touch-typing and the projection box would detect light interruption to find which key one typed. Another technology would be a display-anywhere where, again, one can project an image on any surface such as a file cabinet, a medicine cabinet, a desk, the ground, etc *(Jean Paul)*	XX		X	X
▪ **Improved quality video teleconferencing** announced by companies such as [Lifesize], [Tandberg], and [Polycom] promise a better learning experience through high definition video and surround sound, as well as ease of use multipoint connectivity. The higher quality video and sound makes the technology more transparent to the learner; the multipoint capability allows for the bringing in of multiple "voices" — there is the possibility for this to be used both as a communication device among students at different locations (e.g. onsite on project, different schools) as well as by instructors bringing the world into their classrooms on a planned or ad hoc basis. And not just improved quality: simpler technology so that it doesn't require a technician to run a video conference. This would really set video conferencing "free." (Malcolm)	XXXXXX		XXXXX	

	Vote	Adoption Horizon		
		12months	**2-3 Years**	**4-5 Years**
Self Service Video Capture - Technologies for capturing lectures and other fixed location group events now exist which enable a faculty member to walk into their classroom and initiate a capture of a class session that can be automatically uploaded to the web. When it saves time, faculty will adopt. *(Phil Long)*	XXXXX	XXXX	X	
Individually controlled self-darkening 'glass' panels - They're here today - they're installed in the high-tech, and high cost luxury suites and board rooms - clear panels that give transparency to enclosed spaces (seminar rooms, CTL's etc.) but they are too costly. A market is ready for them by demonstrating the size fo the market, the prices will fall to make the market viable. *(Phil Long)*				
Mapping - NASA World Wind *(Malcolm Brown)*	XX		XX	
Advanced Video conferencing (Access Grid)	X		X	
High Def TV; issues of quality, self-service)				
Learning objects from the military (Codra the depository of LO depositories)				
Evolution of mapping (World Wind)				
Gaming (World of Warcraft model)	XX		XX	
Location awareness (things, functions, programs that operate based on location; example: maps of coffee shops around the hotel; description of pace, location relevant info, issues of privacy, Google Dodgeball) *(Malcolm Brown)*	XXXXX		XXX	X
On demand printing - New ways to create customized (good) and cost-effective (better) course packs and texts from companies like FedExKinkos.com, Lulu.com, QOOP.com.	XXX	XXX		

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			Adoption Horizon	
	Vote	**12months**	**2-3 Years**	**4-5 Years**
3. What are the key emerging technologies you see developing to the point that colleges and universities should begin to take notice during the next 3 to 5 years? What institutions or companies are the leaders in these technologies?				
▪ **Augmented Reality** - there's a light form of this, which we've already seen with art projects like YellowArrow. A heavier form depends on wearable computing and intensive graphics rendering, which has been piloted, but isn't mature in 2005 *(Bryan Alexander)*	XXXXXXX XXXXXXX XXX		XXX	XXXXXXXX X
▪ **Haptics and other multi-modal technologies** – gesture recognition, especially *(Diana Oblinger)* I think that gaze tracking, which is technologically simple and inexpensive will play an important role. We have working demos at IBM Research. *(Jean Paul)*	XXXX		X	XXX
▪ **Next generation presence-awareness** – your technology knows what you are doing, where you are, and delivers information to you based on that, eg. my phone is not ringing because it is linked to my calendar and knows I am in a meeting – but if my spouse were to call, that call would come through. *(Diana Oblinger)*	XXXXXXXXX XXXXX		XXXXX	XXXXXX
▪ **Seamless Connection of Student Owned technology** transparent handoffs, authentication. Non computer devices begin to dominate as content access point _(Alan Levine); including seamless access with mobile devices to digital libraries, course websites, collaborative tools, etc. (Ruth S)	XXXXXXXXX XXXXXXXXX		XXXXXXX	XXXXXX

	Vote	Adoption Horizon		
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▪ **Next-generation folksonomic tools** while the commercial tools (see above) are ready for use, there are important features (e.g., reputation systems, coupling to search engines) that they have not touched upon yet, and are essential to solving potential problems (e.g., folksonomic spam) and creating new academic uses (e.g., "living" knowledge repositories). *(Ruben Puentedura)*	XXXXXXXXX		XXXXXX	XX
▪ **Techniques to display complex documents on displays the size of a (large) stamp** There are 1.5 billion cell phones worldwide, but only 400 million PCs. These phones could be the opportunity to get access to the functionality of a networked computer and to participate in the digital world by using artifacts (SW) that permit one to display and interact even with complex documents. *(Jean Paul Jacob)*	XX X XXXX		XX	XX XX
▪ **Gaze tracking** Gaze information plays an important role in identifying a person's focus of attention. The information can provide useful communication cues to a multimodal interface. For example, it can be used to identify where a person is looking, and what he/she is paying attention to. On a computer screen, this can be used to understand what is of interest to the user. When looking at the first 10 hits of a total of one million hits in a search, the user's eyes will spend more time in the pages(hits) of interest, helping the system filter the remaining hits to choose those with the same key words of hits that the user spent time. *(Jean Paul)*	XXX	X		X
▪ **Personal-Social Information Management Tools** - there are plenty of personal information management tools around but I haven't found one that really cuts it yet. These tools need to be able to switch between outline and visual representations and need to connect an individual's information/knowledge with their communities of interest and practice, with whatever else is out there in the world. *(Nick Noakes)* ALSO: "collectors" (much like the Mac app iOrganize) to enable you to collect into a kind of digital	XXXXXXXXX XXXXX	X	XXXXXXXX	XX

		Adoption Horizon		
	Vote	**12months**	**2-3 Years**	**4-5 Years**
scrapbook all the references, content, etc. you run across while do research.				
▪ **Voice Lecture/seminar Translation & Indexing** - Podcasting is currently the rage and we have the tools to take audio and stream them from various sites. What's missing is the abilty to do voice-to-text as easily AND to have semantically meaningful indices created that point you to where in the audio stream a given concept or important text segment is spoken. But it won't be too far from now. See: .Spoken Lecture Translation *(Phil Long)*	XXXXXXX		XXXXXXX	X
Access Grid and Related Mutipoint Videoconferencing - the access grid brings multi sites together in a way that can capitalize on adhoc world wide resources. SGI is working on a project that is similar but brings in local inputs and shares a set of inputs among sites without duplicating all equipment at all sites (Media Fusion) - (Len Steinbach) Again, the real gain will be AccessGrid functionality available at the low threshold so mere mortals can conduct conferencing more spontaneously	XXXXXXX		XXXX	XX
▪ **interoperability Standards - Making Abstractions that Work** - Physical devices currently require too much customization to be easily connected to, operated and supported. The virtualization of peripherals is possible with interoperability software - making proxy's of devices like scanners that students can connect to through the web to operate specialized devices (e.g., a scanner). *(Phil Long)*	XXX			XXX
Remote labs - physical laboratory equipment is often too costly, dangerous, or just doesn't scale sufficiently to be affordable. Students don't get sufficiently exposed to the messiness of real data from a variety real experiments (*not* simulations). Creating an software infrastructure that not only supports the remote operation of experiments, and doesn't penalize a faculty member who wishes to share their experiment with others possible is in development today (see iLabs	XXXXXXXX		XXX	XXXXXX

		Adoption Horizon		
	Vote	**12months**	**2-3 Years**	**4-5 Years**
▪ **3D Visualization Tools** - Computational power of today's PCs make it possible to do powerful real-time 3D visualizations. Interactive and pedagogically designed visualizations can bring breathtaking richness to otherwise abstract, highly mathematical and challenging phenomena, without the need to buy costly, optimized visualization engines to run them. *(Phil Long)*	XXXXXXXX		XXX	XXXXXX
▪ **Engineering Biological Parts** - Building biologically active structures has to date been highly technical, non-scalable, and extremely challenging. Treating bio-active building blocks like 'parts' and sequencing them together based on their known properties, can 'build' new biologically active structures. This isn't creating "life", but taking an engineers approach to building complex structures and applying it to biological phenomena. Student teams are doing this today and building a biologically active parts database to capture their experience and build on it for others. See iGEM and the Parts Inventory *(Phil Long)*	XX			XX
▪ **RFID** - tagging devices and enabling their interoperation with software so that classrooms 'know the preferred lighting, projector position, and content that you wish to start with in your class is contextually discoverable, and operationally possible to coordinate through intelligent RFID tags and infrastructure. *(Phil Long)*	XXXXXX		XX	XXXX
▪ **Revolution Controller**				
▪ **Augmented Reality** (example: Yellow Arrow as annotation of the physical world; example: 34 West 118 North Stolpersteine				
▪ **Invitation-only access** to information				
▪ **3D** (visualization, printing, data sets; fly-through of spaces	X		X	
▪ **Holograpy** figures and spaces; fully immersible vs. augmented)				

	Vote	Adoption Horizon		
		12months	**2-3 Years**	**4-5 Years**
▪ **Mini-Projectors** (classroom on the fly; built into laptops	XXXXX	X	XXX	
▪ **Flash Memory** and ever shrinking size/increasing capacity of storage devices	XXX		XXX	
▪ **Furniture** designed for integration of collaboration and technological devices (example, Microsoft coffee table; vendor example Herman Miller)	XX		XX	
▪ **New Keyboarding Types and Styles** (example revolution game controller);				
▪ **Google/Yahoo** Massive digitization efforts	XXXX		XXXX	
▪ **Searching** (tolerance of more noise in the information "signals"); mobile and semantic searching Phil modified this to "Not searching, but FINDNG"	XXXX		XXXX	
▪ **Tension of Exact Preservation** (library/museum) vs. good-enough digitization				

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RFID - tagging devices and enabling their interoperation with software so that classrooms 'know the preferred lighting, projector position, and content that you wish to start with in your class is contextually discoverable, and operationally possible to coordinate through intelligent RFID tags and infrastructure. *(Phil Long)*	XXXXXX		XX	XXXX
Revolution Controller				
Augmented Reality (example: Yellow Arrow as annotation of the physical world; example: 34 West 118 North Stolpersteine				
Invitation-only access to information				
3D (visualization, printing, data sets; fly-through of spaces	X		X	
Holograpy figures and spaces; fully immersible vs. augmented)				

	Vote	Adoption Horizon		
		12months	**2-3 Years**	**4-5 Years**
▪ **Mini-Projectors** (classroom on the fly; built into laptops	XXXXX	X	XXX	
▪ **Flash Memory** and ever shrinking size/increasing capacity of storage devices	XXX		XXX	
▪ **Furniture** designed for integration of collaboration and technological devices (example, Microsoft coffee table; vendor example Herman Miller)	XX		XX	
▪ **New Keyboarding Types and Styles** (example revolution game controller);				
▪ **Google/Yahoo** Massive digitization efforts	XXXX		XXXX	
▪ **Searching** (tolerance of more noise in the information "signals"); mobile and semantic searching Phil modified this to "Not searching, but FINDNG"	XXXX		XXXX	
▪ **Tension of Exact Preservation** (library/museum) vs. good-enough digitization				

	Votes
4. What do you see as the key challenge(s) related to teaching, learning, or creative expression that colleges and universities will face during the next 5 years?	
▪ **Information Literacy** – Do students have the cognitive basis to know good information when they find it? Info Literacy has three components: technical, cognitive, and ethical – the last one, ethical, is especially challenging in a remix culture where attribution is less valued than in the past. Information literacy is much more than using a Browser. It encompasses things others call multimedia literacy, visual literacy, etc. Although information literacy has been a topic in the library community it hasn't caught on in other segments yet. *(Diana Oblinger)* How will librarians practically keep up with the digital? *(Bryan Alexander)* For that matter, what does it mean to be a "librarian"? And "literacy" implies a one way consumption of content, where digital literacy is both consuming and producing information *(Alan Levine)*	XXXXXXXX XXXXXXXXX XXXX
▪ **Digital Divide** – while not a new trend, still very important socially. Its not just a question of whether you have a computer, but also access to current software, broadband, technical support, etc. *(Diana Oblinger)*	XXXXXXXXX
▪ **Support** – All of us are becoming less expert. Are we growing that cadre of people that we will need to support the great ideas coming our way? We can't expect to transform education if faculty need to learn instructional design, software applications, etc. And, can these support personnel take the kind of leadership that is necessary to help pull us out of our established ways? *(Diana Oblinger)*	XXXXXXXXXXX X
▪ **Security** – Viruses, worms, phisfers, spam etc. will continue to proliferate. This and the means taken to combat them will have a chilling or countervailing effect on openness, which is critical to discovery and the formulation of new knowledge. Not only do these work antagonistically, the need to address security consumes support resources that could be directed to teaching, learning, and research. *(Malcolm Brown)*	XXXXX
▪ **Science and Technology Leadership** – we are not graduating or attracting the numbers of people we need in the sciences, and are falling further behind all the time. We need a "Sputnik" episode to wake us up. *(Diana Oblinger)*	XXXXXX
IP issues - we're returning to the medieval theme of cloisters, by walling off campus digital environments. At the same time, global projects and functions increase in ease of use, scope, and importance (Web 2.0, GoogleEarth, etc. etc.) How to respond to this enormous division? *(Bryan Alexander)* An interesting data point in this regard will be provided by the success/failure of the New York Times' new model: will putting their op-ed columnists behind the wall of "Times Select" bring in more revenue, or will it simply reduce their relevance to the world at large? *(Ruben Puentedura)*	XXXXXXXXX

	Votes
▪ **Student/Teacher Gaps In Tech Use** it may grow wider and create more discomfort and dis-satisfaction *(Alan Levine)*; particularly as faculty continue to apply technology to the old way of doing things while students apply commonplace technology in completely disruptive old patterns of work, communication, learning, etc. *(Ruth Sabean)*	XXXXXXXXX
▪ **Technology Churn** Can we live with technologies that recycle, grow, change on a monthly, daily basis, rather than yearly basis? Can we accept not being masters of technology? *(Alan Levine)* As these technologies change, the cost, support, renewal & replacement costs grow, how do we balance those and compete with the growing cost of supporting aging physical campuses, and aging enterprise systems *(Joeann Humbert)*	XXXX
▪ **Balancing Technology and Teaching** Not just using technology, but using it in effective ways that enhance the classroom experience without derailing or overwhelming it. *(Rachel Smith)* Providing faculty with on-demand technology training and support *(Joeann Humbert)* or getting more people into a DIY frame of mind (e.g. not dependent on cookbook training. *(Alan Levine)*	XXXXXXX
▪ **Assessment** Although we may get excited about the opportunities technology presents, does it really make a difference in learning, student retention, etc.? *(Diana Oblinger)* This is a big one; there's a huge amount of sorting out that needs to happen in this regard. *(Malcolm Brown)* Not all tenured faculty are convinced that technology makes a difference in teaching effectiveness and resist the pressure to integrate new technologies into teaching. *(Joeann Humbert)* Playing off that last point: many faculty fail to see that there might be problems with the way they teach (even when they exist), or that there is plenty of room for improvement in modes of teaching traditionally viewed as successful. So, the assessment issue has to couple the technological angle - does the technology really help - with making faculty aware of the unaddressed issues that exist in current practices. *(Ruben Puentedura)*	XXXXXXXXXX XXXXXX
▪ **Curriculum design & course evaluation** is what we are teaching relevant to what professionals do? Are student satisfied with their course of study? What matters? *(vincent doogan)*	XXXXXX
▪ **Scalability** We have seen lots of innovations in higher education, but many of them are still one-of-a-kind efforts. What can we do to scale our innovations? How do we implement what we already know? *(Diana Oblinger)*	XXXXXXX
▪ **Funding** - Convincing those who control the academic purse strings that adequate funding is not only imperative, but must be ongoing (especially those who do not yet appreciate the relationship of technology to improved, efficient & effective teaching & learning). *(Sue Bauer)*	XXXXX
▪ **FUD** - Fear, Uncertainty, and Doubt will always be with humans facing change. *(Alan Levine)*	

	Votes
▪ **True cross-institutional collaboration** - we are rapidly approaching if not arrived at the point where every institution can afford to provide all the experiences, resources, content, and tools that students attending a particular institution need entirely on their own. Real sharing of infrastructure, technology resources, and content in ways that leverage the shared resource and substantively use it in critical courses offered by the institution remains to be done. *(Phil Long)*	XXXXXXX
▪ **Peer review** - The traditional system of pre-publication peer review is creaking to a halt; moreover it does not scale up to the rapidly evolving content that will populate the "courses" and "journals" in the future. New systems are needed that identify and direct users to high quality content and that support current and emerging review, promotion, and tenure processes. *(Richard Baraniuk)*	XXXXXXX
▪ **Access to broadband** (e.g., on and off campus)	XX
▪ **Instructional Design** and faculty development (innovation vs. low threshold)	X
▪ **Digital Asset Management** and all the issues associated with it ([Black rhino metaphor](#))	XXX
▪ **Academic process** there is currently not a single part of the academic process that substantively encourages faculty by rewarding them professionally for experimenting with technology, shifting their teaching, building on each others works, collaborating on new ways to frame learning, publishing their content, etc. This is the primary barrier to significant change regardless of the new technologies we apply.*(Ruth Sabean)*	XXXXXXXXXX XXX

Phil linked *Peer Review* and *Academic Process*

Instructions: Please distribute ten (10) votes among the items in this document with an "X" in the *Vote* column next to those you think will be most relevant to college- or university-level teaching, learning, or creative expression. When completed, please email your ballot to Larry Johnson at johnson@nmc.org or fax it to 830 629-0241

	Votes
5. What trends do you expect to have a significant impact on the ways in which colleges and universities approach their core missions of teaching and research?	
▪ **Timeshifting** – technology is allowing us more and more freedom to choose when and where we want to have an experience *(Diana Oblinger)*	XXXXXXXXX
▪ **Distributed Cognition/Social Networking** *(Diana Oblinger)*	XXXXXXXXX
▪ **Visualization** – 3-D can hold more info than 2-D *(Diana Oblinger)*	XX
▪ **Increasing Individualization** the explosive growth of self-publishing is just one example; Flickr and other online communities also encourage individualization of the experience; peer-to-peer has some interesting social dimensions that facilitate this as well *(Diana Oblinger)*	XXXXX
▪ **Mobility** – People increasingly want their technology to go *(Diana Oblinger)*; which for students means on the device they always have with them, their cell phones (Ruth Sabean)	XXXXXXXXX XXXXXX
▪ **IP again** - see previous notes in Question 4 about walled gardens versus open content *(Bryan Alexander)*	XXXXXXXXX
▪ **Consumption to Creation** - Web 2.0, aka the Programmable Web, aka Web as platform. The move from Web 1.0 applications, aka the Read/Write web to Web 2.0 (e.g. RSS, folksonomic tools and net documents mentioned above). Follow the Wikipedia link wrapped around Web 2.0. Click here to see a visualization of this movement. Also the Web 2.0 Meme Map produced by Tim O'Reily posted on Flickr. More visual representations. *(Nick Noakes)*	XXXXXXXXX X
▪ **Remix and learn** - Mashups of Web 2.0 applications. Click here to view a Web 2.0 Mashup Matrix. A new (coalescing?) group of people are pushing the web and are arguably a 'small pieces, loosely joined' type of distributed 'group'. Mashups here refer to mixes of Web 2.0 applications such as Google Maps, MSN Earth and Flickr. I think this is important because it is the spread of the remix culture that John Seely Brown and others discuss moving pervasively into all forms of learning. *(Nick Noakes)* For an interesting example, see ColrPickr, which uses Flickr's and other sources' APIs to allow people to search a wide range of photographic content simply by color. *(Larry Johnson)*	XXXXXXXXX XXXXX
▪ **Large Data Sets Loosely Joined** For that matter, the success of Google and Flickr who expose their data/APIS to third party developers is a milestone and contradiction to old models of protection *(Alan Levine)*	XXX

	Votes
▪ **The new Services Economy** - Traditional departmental silos will have to be strongly bridged to give students the necessary education to work in a Services dominated economy. Using the language and needs of the digital natives (interactivity, instant gratification, immersion, etc) colleges will teach sciences, economics, ethnography, etc, to all students using new media, including games. *(Jean Paul)*	**XXXXXXX**
▪ **Collaboration** - technologies that help to shrink the world and facilitate communication within and among groups. Many are listed in the responses to this and the other questions. In order for collaboration to flourish the technology must be easy to access, easy to use, pervasive, and provide high quality delivery of the content. *(Sue Bauer)*	**XXXXXXXXX X**
▪ **Faculty Development** - Must be on-going, cutting edge, engaging, convincing. Must be supported by upper administration; i.e., finance the effort so that well-prepared personnel and high quality technology are employed to deliver & support faculty development. Faculty won't take the time nor make the effort to "develop" if the program is not well supported (i.e., $$ & quality) *(Sue Bauer)*	**XXXXXX**
▪ **Consumer Expectations** - As individuals use technology for personal use, e.g. Amazon shopping, NetFlix, auto purchase research, getting health information online, sharing photos online, their expectations for e-services will be confronted with a perhaps rigid, 9-5, paper driven education establishment. *(Alan Levine)*	**XXXXXX**
▪ **The Influx of Student Personal Technologies - Leveraging it for Academic Work** - Students are bringing their own technology to campus and increasingly to class. Often their equipment is more contemporary that that offered by the institution, if it offers it at all. Universities and colleges will need to figure out how to leverage student-owned technology and rethink their teaching to take advantage these as resources, in some cases in place of what they have traditionally acquired and made available for their students. *(Phil Long)*	**XXXXXXXXX**
▪ **Crisis of International Students** - the US depends heavily on international students in the STEM disciplines, principally in graduate school. However, misplaced travel, immigration and resident work restrictions imposed in the name of 'security' severely isolate the US and threaten to make the only international experience students have in the future 'virtual'. *(Phil Long)* See note at end….	**XXX**
▪ **Reduced Federal and State Financial Support** - We're seeing the evisceration of NSF, the transforming of DOEd, and the closure of funding source after funding source happening before our eyes. From 2000 to 2004 NSF funding for teaching in the sciences and engineering has nearly been cut in half. Industry isn't stepping in to make up the declines. We must be more articulate and engaged with those making funding decisions or advising those who are, about the importance and critical necessity of federal support for teaching and learning in higher education. *(Phil Long)*	**XXX**
▪ **Open access** - It may become increasingly important for institutions to expose their educational content by some kind of open access mechanism; the drive for this might come from the faculty themselves. *(Richard Baraniuk)* ; a version of the open courseware initiative/movement that enables students (and possibly others) to "publish" their work and build on the work of others under the CC license (Ruth Sabean)	**XXXXXX**

	Votes
• **Homeland security** (what records are public, Patriot Act-related restraints)	
• **Virus and Computer Security Issues**	X
• **Promotion of Deep Learning** (example: digital storytelling)	XX
• **Remix Culture** (student expectation to remix the curriculum; "where" is the discipline?)	
• **RSS Feeds College Students' Diet for Research** Ediriwickrema is part of the growing number of on-the-go, sleep-deprived students who recognize the value of an Internet technology called RSS and are milking its benefits for use in the classroom.	XX
• **Is 'CraigsNews' Coming Soon?** The movement known as collaborative citizen journalism is gaining sharper focus. What kinds of partnerships will make it thrive – and how will the mainstream media react?	
• **Google Extends Book Scanning Operation** Google isn't backing down from its plan to scan every book in the world.	XXXXX
• **Britain Sees Fundamental Shift in Publishing** A new study by the British Library predicts that by the year 2020, 90 percent of newly published work in the United Kingdom will be available electronically. Just 10 percent of works published then will be printed only, and half of those published electronically will also be printed, according to the study.	XX
• **Continuous Computing** The proliferation of cheap mobile gadgets, wireless Internet access for everyone, a new Web built for sharing and self-expression...suddenly, computing means connecting. •	XXX
• **Net Gens established on campus** (as students; soon if not now as post docs and assistant professors. *(Malcolm Brown)*	XXXXX

Crisis of International Students—I see this as important, but not necessarily for the reasons stated. I think we will see a shift in the perception and status of a USEducation as more and more universities partner globally, and as more US educated, international students return to their home countries and work within their systems to create educational systems. On one hand I think it will open opportunities for students who would never come to the US, but it will also create competition for those students who may choose to be educated in their home countries at high standards. In the end I hope it creates a more collaborative, global relationship in education. — Humbert