ATEP BILT Notes. January 20, 2012 BWI Courtyard Marriott

Members attending:

Name	Organization/Position	Email	Office Phone
Ann Beheler	Collin College, Orange Coast College	abeheler@gmail.com	972-377-1649
Sandy Clark	Delmar Cengage Learning/Editorial Director	Sandy.Clark@cengage.com	518-348-2627
Sulatha Dwarakanath	Nano Science Diagnostics/Chief Scientific Office	sdwaraka@austincc.edu	914-419-0287
Charles Goodwin	NYS Technology Education Advisory Council/Chair	cgnystea@stny.rr.com	607-785-1680
Tony Gordon	Hofstra University	AGORDON@LWTA.net	989-835-3526
Mike Hacker	Hofstra University/CSR, co-director	mhacker@nycap.rr.com	518-724-6437
Deborah Hecht	CASE/CUNY Graduate Center, Senior Evaluator	DHecht@gc.cuny.edu	212 817-1734
Jim Kiggens	ATEP Project Consultant	jkiggens@coursegames.com	805-683-7670
Michael Morton	Arlington Virginia Public Schools/former CTE Director	mkmorton@verizon.net	703-534-8369 (h)
Brian Shmaefsky	Professor of Biology & Service Learning Coordinator Lone Star College - Kingwood	Brian.R.Shmaefsky@lonestar.edu	281-312-1609
Kendall Starkweather (Chairperson)	ITEEA/Executive Director	kns@iteea.org	703-860-4738
Gordon Snyder	National ICT Center	gsnyder@stcc.edu	
Scott Veibell	Cisco Systems/Technical Support Manager	sveibell@cisco.com	
Bill Vitale	Precision Elastomers/VP of Research & Development	bill@noguiltdesigns.com	978-356-1030
Cindy Weber	Durand Area School, Durand, MI/Superintendent of Schools	weber@durand.k12.mi.us	989-288-2681
Joyce Winterton	NASA Wallops Flight Facility/Sr. Advisor for Ed. & Leadership Development	joyce.l.winterton@nasa.gov	757-824-2685
Karen Wosczyna Birch	Center for Next Generation Manufacturing Center	karenlee@snet.net	860-490-4545

Chair, Dr. Kendall Starkweather, Executive Director, ITEEA

ATEP Business and Industry Leadership Team Agenda

January 20, 2012

Baltimore, Maryland

WWW.Hofstra.edu/ATEP

8:00 AM Continental Breakfast
8:30 AM Introductions and Project Overview (Kendall Starkweather and Mike Hacker)
9:30 AM Presentation: ATEP Research Park App (Jim Kiggens)
10:00 AM Presentations: (Gordon Snyder and Ann Beheler)

- *Information and Communication Technology in the Social and Global Context: Trends and Implications for Teaching and Learning.*
- Overview of ICT Content Framework and Multimedia.
- ICT Discussion.

11:00 AM Coffee Break
11:15 AM Presentations: (Karen Wosczyna-Birch)

- M*aterials and Manufacturing Technology* (MMT) *in the Social and Global Context: Trends and Implications for Teaching and Learning.*
- Overview of MMT Content Framework and Multimedia.
- MMT Discussion.

12:15 PM Lunch in Meeting Room
1:15 PM Presentations: (Brian Shmaefsky and Sudartha Dwarakanath)

- Bio and Chemical *Technology in the Social and Global Context: Trends and Implications for Teaching and Learning.*
- Overview of Bio and Chemical Technology Content Framework
- Bio and Chemical Technology Discussion and Multimedia.

2:15 PM Presentations: (Sandy Clark and Tony Gordon)

- Publisher's Guidance and Proposed User Interface
- Summary, Next Steps, and Questions that need to be addressed (Kendall and Mike)

3:30 PM Sayonara

Meeting started at 8:30 AM. Kendall Starkweather, ITEEA Executive Director opened the meeting.

Member introductions.

Overview of Project presented by Michael Hacker, Project PI. PowerPoint presentation available at www.hofstra.edu/atep - see Business and Industry Leadership Team,.

Research Park Simulation presented by Jim Kiggens, remotely from California. The simulation environment will be similar for all three domains. It will be a 3D interactive environment wherein students would do coursework. The application is client/server architecture which will reside in parallel with the learning management system. It will be programmed in HTML 5. Most content will be streamed by the server.

Some questions that were raised relative to this presentation were:
How do you teachers change to accommodate new technologies?
Is there a way to do this in open source?
What about getting student reviews?
Are there R and D opportunities for publishers?
Might there be other simulations to accompany the project materials?

Can we create an ATEP 'brand" as a part of this Project?
What would be the per yearly cost for schools?
A media development cycle needs to be much quicker than five years.
Can this Project become a STEM model?
Who will be the customers/users?
How much mathematics will be embedded in the activities?
Which core content and skills will be infused? Which standards will be the basis?
Will having collaborative teams of teachers be a possible?

Suggestions prompted by the Research Park initiative:
We must be sure not to create new silos.
The strength of this Project is its content integration.
Make clear WHY students need to know the content and skills proposed.
Be sure that the Project reflects diversity and attracts women and minorities.

Discussion ensued about the advisability of using open-source methodology. Sandy expressed a concern about digital rights issues and suggested that there may be R&D opportunities to extend to customers the opportunity to modify products in a controlled (not open-source) environment.

Sandy expressed that contextual learning is very important and may people will be excited about this metaphor.

Scott suggested that there could be modules that could be "dropped in" to the framework….those could coexist, and he advised that we should not build a model that does not allow coexistence.

Chuck advised that we keep costs in mind relative to upgrade cycles for software.

Scott and Ann reminded us that one year "is a lifetime" in the ICT world; and that after five years, content loses much of its value.

Mike M. and Cindy Weber reminded us of the importance of building STEM ideas and a strong focus on content skills into the curriculum.

In that regard, Sandy was curious about the mathematics, the level, and how it would be taught.

Joyce suggested that a strength of this program was its approach toward integration of content and the use of team-based activities to stimulate collaboration.

Likewise, Sulatha advised that we keep in mind the idea of a capstone project for students to be able to synthesize skills and ideas and Sandy offered that team skills could and should also be integrated into the capstone project, which as Joyce noted, would also involve "time-critical" solutions.

The idea of putting the mathematics in context helps students see its importance, and as Scott noted, knowing that mathematics is important is a key factor in student motivation to learn.

Karen and Michael H. reminded us that we should use examples that are attractive to women….those that are focused on the real world, address personal and health related issues, and are human-centered.

Gordon Snyder made a presentation on ICT in the global and social context. He discussed that throughout the country, even in the northeast, there are many areas without broadband access but that 98% of high school students have smartphones. He made mention of Project Tomorrow, whose mission is to ensure that today's students are well prepared to be tomorrow's innovators, leaders and engaged citizens of the world. They believe that by supporting the innovative uses of science, math and technology resources in our K-12 schools and communities, students will develop the critical thinking, problem solving and creativity skills needed to compete and thrive in the 21st century.

In discussing the trend toward mobile access and personalization of content, Gordon mentioned Flipboard and Readitlater.com. The latter enables saving stories, videos, recipes and images right from a browser, and then enables people to come back to it anytime they want: at their desk at home or work, on a flight or on the go. Gordon noted that content needs to be relevant, just-in-time, and curated.
He cited, as an example of misuse of a technology, was where for two weeks, students learned using Khan Academy videos.

Ann commented that everything is going mobile and that the changes are increasingly more rapid.

Chuck advised that it's important for our design challenges to "blend in the physical."

Mike M suggested that we might consider a phased assessment and accountability approach, where for a "C" grade, students do what they're asked; for a "B" grade, they go beyond that expectation, and for an "A" grade, they teach someone else.

Cindy and Joyce reminded us that we need to ensure balance and take different learning styles into account and that we need to build in appropriate times for teacher intervention.

Debbie wanted us to keep the professional development needs of teachers in mind; that we should provide appropriate professional development to ensure that teachers are able to implement these materials in the way the development team conceives them.

Chuck pointed out that we can't lose sight of teaming skills and conversations among team members, but that we must still have some hands-on activities and ensure that our students don't lose touch with how to related to each other face-to-face in this age of virtual communication.

Cindy added that it is important to have professional development built in to our program so that teachers feel confident in its delivery. She referenced Destination Imagination, an organization that provides educational programs for students to learn and experience creativity, teamwork and problem solving (according to their website, www.idodi.org.

Sulatha remarked that she sees, in our program, a good combination of instructional strategies:

Mike M. reminded us of the 4th dimension, time; and suggested that we think about our assessment philosophy.

Bill suggested that we should integrate hands on learning with IT delivery in manufacturing. He said "some people still need to understand how to us the "Bridgeport " (milling machine).

Joyce advised that we include "ethics" and "integrity" as constants in what we develop.

Ann mentioned how this project is evolutionary where we are not only developing content, but a contemporary LMS. To that point, Gordon discussed the changes that we need to keep in mind when porting content over to our template from the Engineering and Technology text and that his team is struggling with differences from the text materials and the material need for their animations.

Karen reported that within the field of manufacturing there is a misunderstanding about the state of manufacturing in the United States and that there is now a "reshoring" movement in the field. Her Center connects 12 community colleges and four universities. The Next Generation Manufacturing (NGM) Center needs to develop "stackable" credentials with varying points of exist and re-entry. The U.S. is still the world's largest manufacturing economy with 21% of global products as opposed to China, which produces 15% of global products. U.S. manufacturing performs 2/3 of all research and development in the nation, contributes 11.2% of GDP, and has a value of $1.6 Trillion each year. In Connecticut, the site of the NGM Center, $25B of revenue from manufacturing contributes to the state's GNP. That amount could increase if there were more workers available with CNC expertise. Manufacturing of pharmaceuticals and medical devices is increasing.

It was noted that an important criterion would be to identify experiences that specifically engage underrepresented students in selecting design activities. To be engaged in this work, females prefer topics that are socially relevant and that design challenges are most appealing when they are seen to result in systems or products that help people. Design criteria should also include:

- An entrepreneurial focus
- Projects/programs that are gender-friendly and socially relevant
- Embedding relevant math and science

Also noted was that the research park initiative would comprise a one-week culminating interactive simulation including assessment items. Seven weeks of prior content would be presented including the history of manufacturing, types, properties, and strengths of materials, careers in manufacturing, and perceptions of manufacturing.

The Manufacturing Course would include:
Modules A and B….to come
Module C: Design for Manufacturing, sustainability, management of manufacturing, CAD/CAM

Module D: Automation and control systems; rapid prototyping; statistical process control; additive manufacturing; careers in manufacturing.

Mike H. reminded the group that the GALE data base is available for us to draw from (in addition to making use of the videos and other media that the Project is producing).

Sandy considers the ACTE conference to be a good venue for dissemination of Project results.

Scott noted that the ATEP manufacturing program could also include *marketing for manufacturing* and *troubleshooting*.

Ann raised the question about the quality of videos that the Project produces and asked about the quality standard that we're setting. Discussion ensued. Likely the Project will include some videos that are not of commercial quality and that will be developed by some team members.

In discussing how we would obtain permissions for use of commercial video (and other assets) Sandy advised that we should ask for permissions in batches to make it easier for Cengage people to obtain these; and also that when using GALE materials, we should stay away from "Opposing Viewpoints in Context."

Brian Shmaefsky introduced members of the writing team in his Bio and Chemical Technology presentation. Team members include: Biotechnology experts (Linnea Fletcher); Chemical technology experts (Brian Shmaefsky); and Agricultural experts (Michael Norton). According to Sulatha, our program will need to integrate ethics, teamwork and problem solving throughout because we don't want our graduates to be "linear thinkers." This is especially important in physics, chemistry, materials science, engineering, data analysis, and software design.

A sample format was proposed for Biotechnology, as follows:
An introduction and pre-assessment
Section I: The Change World of Biotechnology
    Topics
    Assessment
Section II: Applying Biotechnology
    Topics
    Assessment
Section III: Working in Biotechnology
    Careers

The work would include formative components (i.e., self-assessments) and summative assessments; background reviews; animations, videos, web-based resources; a design challenge (virtual); and a wet lab.

Brian reiterated that our program should include a scope of learning, content, application, skill sets (both technical and "soft" skills).

An example of real-world math is dosage calculation for medication.

For field testing, Mike H. remarked that we should recruit teachers from agriculture, CTE, bio tech and biology, and technology education teachers.

In her presentation, Sandy expressed the need to improve technology-based instructor and student materials and media technology; and to consistently "think about what problem your technology is solving."

Some important givens:
Instructor flexibility
Tracking programs
Begin able to document effort and student engagement

Tony discussed the components of a Project Learning Management System (LMS). A control panel would give teachers the change to turn content on or off. The system would include branching/algorithmic control that would control the ability to route according to student performance. Assessment outcomes would be controlled overall by the teacher control panel and would include a broad range of assessment tools. Enrollment and scheduling features would be included, as would a grade book that would display student participation and attainment.

Mike H. observed that we could take a lead from effective educational games -- our materials could have built-in rewards and incentives, and that we should be very parsimonious with text.

Relative to content:
We should be sure it's updatable; make sure each draft is dated, perhaps have different instances on the LMS for teachers so that they can use a prior version if they've started with that version.

Kendall made a compelling point that "teachers need this ready or not – we're blazing the trail."

In conclusion, the BILT members expressed a preference for the next BILT meeting to be face-to-face if the budget could sustain such a meeting. It was agreed that the next meeting would be after the ATEP Full-Team meeting on July 27-29. If a face-to-face meeting was not affordable, web-based meetings of a two-hour time frame were preferred.

Appendix 1. Curriculum, Media Development, Research, and Classroom Testing Timeline

Curriculum, Media Development, Research, and Classroom Testing Timeline for Each Module						
Focus of the Project Year	**Responsible Team**	**Fall Sept-Nov**	**Winter Dec-Feb**	**Spring March-May**		**Summer Jun-Aug**
Year I 9/11-8/12 Development and Pilot Testing	Co-PIs, and Writing Team	Identify Media for Module A and Develop Module A		April 1-May 31: Development team microtests Module A (including content and media).		Review Module A based on micro test and evaluator feedback. Begin development of Module B.
	Media Team	Develop Module A Research and Development Park (RDP) Simulation		Continue to develop Module A Research and Development Park (RDP) Simulation		Finalize Module A RDP Simulation. Begin Module B RDP Simulation
	Research and Evaluation Team	Document procedures, collect survey data.		Collect data about development process and micro testing. Prepare Year I annual report.		Provide formative feedback to writers/co-PIs.
	Cengage Learning	1. Identify ATEP liaisons. **SC** 2. Discuss courses with Mike, pricing, vision (courseware with electronic E&T eBook). **SC & JD** 3. Finalize design doc for LMS. **JP** 4. Strategic planning meeting to be held with ATEP/Cengage staff. February or March 2012. **SC** 5. Jim DeVoe to fund pilot. **JD** 6. Supply additional media (Gale, etc.) for Module A. **????** 7. Need to determine CLMS-hosted solution and GPMS team lined up so they're ready to participate in getting content in pilot. March? **JP, JD, DE**		8. Two-phase funding put in place. Phase I is pilot funding; Phase II is product funding. **Pilot begins 2/2012; need to determine when aus will have content for us to start populating LMS.** 9. Conduct Module A design tests to assess the process of placing bits of content in the LMS, with projected customers. Continue to locate and supply media for Module A.		10. Module A content in ms form (links to sims?) reviewed by customers. Send to about 20 people for review. Need to get reviewers ahead of time? **DE** 11. Edit content and port content into LMS in preparation for Module A eight-week pilot test.. **DE & GPMS**
Year II 9/12-8/13 **Development and Pilot Testing**	Co-PIs, and Writing Team	Finish Development of Module B Content. Supply additional media (Gale, etc.) for Module B.	Feb'13: Pilot Test Module A with customers. Development team microtests Module B (including content and media).	Complete pilot test of Module A by March 30. Populate LMS with Module B content. Begin to Develop and micro test Module C.	April 1-May 31 Conduct pilot test of Module B. Revise Module A based upon usability study feedback. Continue to develop Module C.	Revise Module B based upon usability study feedback. Complete Module C
	Media Team	Develop Module B Research and Development Park (RDP) Simulation		Finalize Module B RDP Sim.	Begin Module C RDP Sim	Finalize Module C RDP Simulation
	Research and Evaluation Team	Collect data about development process and pilot tests.		Collect data about development process and pilot tests. Prepare Year II annual report.		Provide formative feedback to writers/co-PIs.
	Cengage Learning	Port Module A content into LMS. Prepare for usability study. Supply additional media (Gale, etc.) for Module B.	Conduct Cengage Module A pilot test with customers. **Cengage will review Module B Content with customers.**	Complete usability study of Module A by March 30. Port Module B content into LMS. Supply Module B media.	April 1-May 31 Conduct Cengage Module B pilot test with customers. Revise Module A based upon usability study feedback.	Revise Module B based upon usability study feedback. August: Port content into LMS for Module C.

Focus of the Project Year	Responsible Team	Fall Sept-Nov	Winter Dec-Feb	Spring March-May		Summer Jun-Aug
Year III 9/13-8/14 **Development and Pilot Testing** **Preparation for Field Testing**	Co-PIs, and Writing Team,	9/16-11/8/12 Conduct Cengage Module C pilot test (usability study) with customers. Revise Module C 11/9-11/30/12 Begin to Develop and microtest Module D	12/14 - 3/15/14 Complete development of Module D	Pilot test Module D 3/15-5/30/14	May: Revise Module D	June/July: Ready materials for field testing and for FT training. August 2014, Conduct FIELD TEST TRAINING
	Media Team	Revise Module C RDP Sim.	Begin Module D RDP Sim.	Finalize Module D RDP Sim.	Make final revisions to all media.	Help to Conduct Field Test Training
	Research and Evaluation Team	Collect data about writing process and pilot test. Prepare Year III annual report.				Provide formative feedback to writers/co-PIs.
	Cengage Learning	Module C pilot test (usability study) with customers. Revise Module C based upon usability study feedback.	Port content into LMS for Module D. Finish obtaining all video and art assets.	3/14 -5/30/14 Conduct Cengage Module D pilot test (usability study) with customers.	Revise Module D based upon usability study feedback.	Prepare all materials for field testing. Field test training to be conducted in August, 2014.
Year IV **Field Testing 9/14-8/15**	Co-PIs, and Writing Team	Full academic year field test of all modules				Revision of Materials Final Reports
	Research and Evaluation Team	Collect data about development process and field test. Prepare Year IV evaluation report. Formative feedback provided to writers, co-PIs, and publisher.				Provide summative feedback to writers/co-PIs, publisher.
	Cengage Learning	Revise materials based on field test data. Copyedit all materials and prepare for publication				All materials published.

SUMMARY OF KEY DATES

Content and Media Development

- Module A: September 2011 to June 2012
- Module B: June 2012 to February 2013
- Module C: March 2013 to August 2013
- Module D: September 2013 to March 2014

Pilot testing start dates

- Module A: February, 2013.
- Module B: April, 2013
- Module C: September, 2013
- Module D: March, 2014.

Field Testing:

September 2014 – May 2015.