

The Interactive Syllabus: A Resource-based, Constructivist Approach To Learning

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At the outset, let me make clear that the Interactive Syllabus is a tool fashioned along constructivist principles that facilitates the implementation of broader constructivist strategies in an internet-delivered course site. Hence, it is a constructivist *approach* that attempts to solve some fundamental problems in course delivery and design. By interactive, I do not mean to imply an intelligent expert system able to give diagnostic feedback and one that is adjustable based on the learner's knowledge.¹ Rather I mean a learner-manipulated environment in which concepts are presented in different ways and at different times resulting in multiple and adaptive interpretations necessary for knowledge acquisition. In this interpretation, the Interactive Syllabus is the first agent in a reactive stream of course objects, including task-driven assignments, simulations, and communication tools that allow meaning to be negotiated. As such, the Interactive Syllabus can provide a high level of initial interaction between the learner and the material, resulting in increasingly progressive engagement with course materials in a non-linear and adaptive process. It is an instructional design tool that falls within the confines of what Perkins has labeled BIG (Beyond Information Given) constructivism.²

The reason that I have chosen to focus upon the syllabus is that it is usually an orphan in any course design strategy, a text-based given that replicates in digital form its paper twin. Most online courses pay little heed to it, content to have the syllabus play the same calendar and administrative tasks that it has traditionally played. There is nothing inherently "sexy" about the syllabus, and the fact that by definition it brings the structure to the course would seem to make of the syllabus a poor candidate for constructivist innovation. This is all the more reason to select the syllabus as the target of an inquiry into the problems of course design and delivery because the syllabus is the instructional roadmap for the course; all other course functionalities are dependent upon it. How then can we make the syllabus a robust, content-rich learning environment that initiates the student into the creative world of a constructivist learning space?

The urgency of developing constructivist approaches for the syllabus has been compounded with the advent of course management systems that allow faculty members to upload easily their word-processed documents directly into the system. Too often this act is confused with "putting content" into a course site. The syllabus therein contained has often not been broken down into components such as "Course Objectives," "Course Requirements," and "Grading Policies." These prescriptive items are often lumped together with the potentially more interesting descriptive features of a syllabus that

outline the topics to be studied. The Interactive Syllabus seeks to exploit these descriptive items and to create a robust learning environment in an open format that permits self-determined investigation. In this way, the Interactive Syllabus becomes the initial reservoir of course knowledge that will permit students to engage in fruitful and profound study explorations. Whether the course is a hybrid course, that is, one in which the online materials supplement the work in the classroom, or whether the course is delivered asynchronously, the Interactive Syllabus becomes a vital component of a successful virtual learning environment.³

The “look and feel” of the Interactive Syllabus remains discretionary with every instructor. In working with faculty from a variety of disciplines in the development of their interactive syllabi, it has become clear that a table used as a conceptual map with three or four columns (images, topics, readings/viewings/listening, and resources) and as many rows as is required (weeks of the semester, topics to be studied, etc) works well (see illustration of the Jane Austen Interactive Syllabus). The model is scalable, that is, it can accommodate faculty with different technological skill sets from novice to advanced. We also create these tables using an .html editor (DreamWeaver), which gives us the flexibility of adding color and other design elements, such as animations done in Flash. By using certain compression algorithms, we have been able to upload and display these more robust files in course management systems. At Brooklyn College, our faculty and students use Blackboard.

It is important that the instructor search for web-based resources used to put together the Interactive Syllabus to inform the topic to be studied. The resources gathered from the Internet should be not only subject appropriate but also must target different student learning styles. For instance, visual learners will benefit from images, charts, maps, videos, and animations. Auditory learners will respond to audio files, especially if these are linked to the accompanying text files. Kinesthetic learners appreciate materials with controls that allow them to regulate the way in which they interact with materials. A well-designed Interactive Syllabus will appeal to all three of these learning styles in its use of materials.

As a general practice, students should not be assigned the task of finding appropriate links for course topics. By and large, they do not possess the information literacy skills required to undertake this activity. Shapiro and Hughes argue convincingly that “information literacy should in fact be conceived more broadly as a new liberal art that extends from knowing how to use computers and access information to critical reflection on the nature of information itself, its technical infrastructure, and its social, cultural and even philosophical context and impact – as essential to the mental framework of the educated information –age citizen as the trivium of basic liberal arts (grammar, logic, and rhetoric) was to the educated person in medieval society.”⁴ It is worthwhile to remember that the internet is not refereed and that it is home to all biases and beliefs. For the most part, students do not yet possess the discipline-specific research skills and critical apparatus that will make the searching for discipline- and topic- specific resources meaningful. It is, however, an appropriate activity for the discussion board, where social-informational literacy skills can be taught in the context of a participatory discussion

(“knowing that and how information is socially situated and produced” (Shapiro and Hughes, 1986)).

Once these resources have been collected, they must be organized in such a way as to permit the students to progress through materials in a self-directed, autonomous manner. Through the format may appear to be hierarchical, resources found in the “Resources” section should not be numbered or arranged alphabetically. They must be accessed randomly by the students, based upon his/her needs and interests. However, the way in which the instructor displays these well-harvested resources can do much to promote resource literacy “or the ability to understand the form, format, location and access methods of information resources, especially daily expanding networked information resources” (Shapiro and Hughes, 1986). If the medium requires the user to have a particular plugin downloaded and installed, it is important that the instructor give the URL for that plugin, as well as instructions for installation if these are not provided on the download page. If the instructor is producing his/her own audio and video clips, it is important to provide both low and high bandwidth options for the students. In this way, the instructor also promotes tool literacy “or the ability to understand and use the practical and conceptual tool of current information technology, including software, hardware and multimedia, that are relevant to education and the areas of work and professional life that the individual expects to inhabit” (Shapiro and Hughes, 1986).

As much as possible, the Interactive Syllabus puts the students directly in touch with materials under study. For instance, in the Indochina/Vietnam portion of the Imperialism Interactive Syllabus one objective was to present materials that would permit students to reconstruct the changing attitudes about the American presence in southeast Asia as represented in films. In order to accomplish this, we linked to movie trailers and presented these in a chronological order but without commentary. The professor planned to make frequent reference to these films in class discussion and to engage the students in further discussion on the discussion board. The resources in the Interactive Syllabus greatly facilitated these objectives and provided a continuous point of experience for students during these ongoing discussions, in keeping with Kolb’s experiential learning theory.⁵ The idea is to populate the syllabus with rich, robust media that will appeal to students’ different learning styles. This is itself a complicated task, for the search should include not only texts, but also full length texts of online books, publishers’ online course materials, images, audio, and video. When adding sound and video files found on the Web, it is important to link directly to the media file itself and not to the page that houses it for the moment. That page can easily change its look, or simply move to a different location, in which case the media file could no longer be accessed by your students.

The Interactive Syllabus is not the place for students to engage in simulations. Assignments and laboratory explorations are the place for the “doing” part of active learning. The Interactive Syllabus is, however, the *locus amoenus* for cognitive scaffolding and reflective thinking. Cognitive scaffolding means that a student needs to visit a learning space more than once in order to construct meaning. Each visit builds upon prior knowledge as well as new experiences gained from explorations. In between each visit, there must be time for reflective thinking. And because the Interactive

Syllabus presents the student with a rich content environment in an open format, the student is free to criss-cross the learning landscape in an unstructured peregrination. The Interactive Syllabus promotes this kind of “free-range” organic investigation of course content, allowing the learner to determine relevancy.

As it is practiced today, constructivism in the classroom implies learning strategies that promote the construction of meaning in order to learn. As such, learning is an active process leading not only to the construction of a single meaning but also of a system of meaning. The Interactive Syllabus is based upon an understanding of this complex semiotics in its presentation of subject matter. One way is through the use of several types of embedded chronologies. In the Imperialism Interactive Syllabus, for example, there is an historical chronology of Indochina and Vietnam in the unit on French Imperialism, with hyperlinks to more information about people, places, and events found on this timeline. Students are thus led to an exploration of these materials that inform their study on the nature of the French presence in the region that would ultimately lead to struggles for independence. A similar historical chronology is found in the Picasso Interactive Syllabus (see illustration). Also in the Picasso Interactive Syllabus, there is a contextual chronology that explores Picasso in light of the writers, artists, and musicians that impacted his creative sensibilities (see illustration). Finally, in the Jane Austen Syllabus, there is an opus-driven chronology that explores Jane Austen’s life in the light of her own work (see illustration). Each chronology offers extensive pathways with hyperlinks to a variety of media so that students can gain a broad understanding of the subject matter as they explore these chronologies. It is not necessary that these chronologies be explored sequentially. Students can revisit them on a need-to-know basis, making the chronology a flexible learning environment. Each time the student revisits a chronology, s/he adds new knowledge and reconstructs meaning, thereby adding a level to his/her cognitive scaffold.

The Interactive Syllabus should provide a learning space for reflective activity. For instance, in the Mozart Interactive Syllabus, there are links to opera scores and libretti, sound files and video files (see illustration). A student can immerse himself in a contemplative study of the music that is available 24/7. S/he can revisit certain works as many times as needed for a full understanding of Mozart’s genius. In addition, the works are included in the assignments and on the discussion board so that the resources found in the Interactive Syllabus provide basis for the virtual concert experiences in the assignments that are then discussed at length on the discussion board. Similarly, in the Picasso Interactive Syllabus, image galleries displaying paintings from different periods of Picasso’s creative life are embedded in the syllabus so that students can study the artist in the context of this “virtual museum” (see illustration). The advantage of these image galleries is that they reunite works from around the world that may otherwise never be displayed together. The instructor acts as a “virtual curator” of a collection in preparation for increased student mastery of the material in the assignments. In the galleries I created, each work has been carefully identified, including the copyright information, using Photoshop. In the assignments that follow, students are then asked to view Picasso exhibits on museum sites and comment upon them on the discussion board. The resources found in the Interactive Syllabus are always meant to stimulate informed

conversation on the discussion board. As both Vygotsky⁶ and Pask⁷ have noted, language and learning are tied dialectically. Knowledge is the result of the social interaction of learners engaged in an informed dialogue.

There are two different kinds of Interactive Syllabi, each corresponding to a different learning domain. The first domain is the well-structured domain represented by the physical sciences. Here the subject matter is not open to discussion. It must be learned in an orderly, sequential fashion in order for the student to master the subject. In this case, the Interactive Syllabus must be designed in such a way as to present a single unifying representation. As a result, in the Microbiology Interactive Syllabus (see illustration), I have created a Flash animation from line art that displays the key concepts being discussed in a unit. The animation is then placed at the head of the Interactive Syllabus to inform the topic by putting into motion what would otherwise be a static and less intuitive presentation. The line art is included as a resource. In this way, the rigors of the discipline are adapted to a more flexible learning environment and to different student learning styles.

With ill-structured domains⁸ (such as history, literature, art history, and music appreciation), the construction of flexible learning environments becomes essential so as to permit the open acquisition of knowledge in a non-structured way. The use of multimedia to enrich learning is highly desirable with ill-structured domains. Assuming that the Interactive Syllabus has been designed to appeal to differing learning styles, it will contain media that will encourage exploration by all students in the class. Reed *et al.* found that students with different learning styles achieved the same level of performance in a hypertext learning environment.⁹ Ill-structured domains require students to appreciate complex interactions among several key concepts. For instance, in the Imperialism Interactive Syllabus, students learn about Gandhi either by reading about his life, viewing documentary video clips about his life and work, or viewing a multimedia slide show about his life (see illustration). Along the way and with the use of hypertexted and multimedia resources, students engage with great autonomy in deeper explorations of the British Raj, leading them to a greater understanding of imperialism. These understandings are communicated through social discourse with the instructor and with other students on the discussion board. The result is higher level thinking produced by a “cross fertilization of information sources across media formats.”¹⁰

When aligned with constructivist course objectives, the Interactive Syllabus offers learners a pedagogically rich portal to course materials that form the basis of the course investigation. For the instructor, the Interactive Syllabus is a relatively simple way to engage students with different learning styles in unstructured explorations with a variety of content-rich media. The Interactive Syllabus benefits both well-structured domains and ill-structured domains. It can be easily integrated into a course management system, or it can be part of an online course with an open architecture. As such, the Interactive Syllabus is a very far cry from its paper source and can become a very interesting component of any online course.

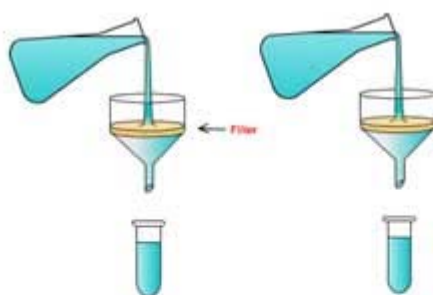
ENDNOTES

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- ¹ K. Baniulus and B. Tamulynas, "Flexible Learning in an Intelligent Tutoring Environment." In P. Kommers, A. Dovgiallo, V. Petrushin, and P. Brusolovsky, *New Media and Telematic Technologies for Education in Eastern European Countries* (Enschede: Twente University, 1997).
- ² D.N. Perkins, "Technology Meets Constructivism: Do They Make a Marriage?" in T.M. Duffy and D.H. Jonassen, eds. *Constructivism and the Technology of Instruction: A Conversation*. Hillsdale, NJ: LEA, 1992.
- ³ "(...) we define a *virtual learning environment* as one that allows learners to perceive the environment, assess situations and performance, perform actions and proceed through experiences and lessons that will allow them to perform better with more experience on repetition on the same task in similar circumstances. This definition of a virtual learning environment emphasizes the importance of *learning*. Learners in a virtual environment are expected to make use of and include examples, observations, experiences, situations, rules, concepts and techniques in a continuous (e.g., day by day or week by week), permanent (i.e., committing knowledge into memory) fashion to improve the performance of the execution of tasks." Juan R. Pimentel, "Design of Net-learning Systems based on Experiential Learning," *JALN* vol. 3:2 (1999): 12-13 (http://www.aln.org/alnweb/journal/Vol13_issue2/pimentel.htm).
- ⁴ "Information Literacy as a Liberal Art: Enlightenment Proposals for a New Curriculum," *Educom Review* 31:2 (1996) (<http://www.educause.edu/pub/er/review/reviewarticles/31231.html>)
- ⁵ D.A. Kolb, *Experiential Learning*, Prentice-Hall, 1984.
- ⁶ Lev Vygotsky, *Mind in Society*. Cambridge: Harvard UP, 1978.
- ⁷ Gordon Pask, *Conversation, Cognition, and Learning*. Amsterdam and New York: Elsevier, 1975.
- ⁸ "An ill structured knowledge domain is one in which the following two properties hold: (1) each case or example of knowledge application typically involves the simultaneous interactive involvement of multiple, wide-application conceptual structures (multiple schemas, perspectives, organizational principles, and so on); and (2) the pattern of conceptual incidence and interaction varies substantially across cases nominally of the same type (i.e., the domain involves across-case irregularity)." Rand J. Spiro, Paul J. Feltovich, Michael I. Jacobson and Richard L. Coulson, "Cognitive Flexibility, Constructivism, and Hypertext: Random Access Instruction for Advanced Knowledge Acquisition in Ill-Structured Domains," in L. P. Steffe and J. Gale, eds., *Constructivism in Education* (New Jersey: Lawrence Erlbaum Associates, 1995) 92. (<http://www.ilt.columbia.edu/ilt/papers/Spiro.html>).
- ⁹ W. M. Reed, D. J. Ayersman, and L.A. Kraus, "The Effects of Learning Style and Task Type on Hypermedia-based Mental Models," *Journal of Educational Multimedia and Hypermedia* 6:3/4 (1997): 285-304.
- ¹⁰ Erik F. Strommen, and Bruce Lincoln "Constructivism, Technology, and the Future of Classroom Learning" (<http://www.ilt.columbia.edu/K12/livetext/docs/construct.html>).

Appendix (Illustrations)

Microbiology Interactive Syllabus: Animation

Protein-DNA complex



TOPIC	READINGS	WEB RESOURCES
		Cloning Genes Primer on Molecular Genetics Restriction Enzyme Database

Jane Austen Interactive Syllabus

WEEK	TOPIC	READINGS	RESOURCES
Week 1 	Becoming a Woman Writer	Juvenalia: <i>Love and Friendship</i>	Chronology of her life Bath: Austen's City Austen Family Genealogy Her home Map of England and setting for her novels
Week 2 	Austen and the	<i>Northanger Abbey</i>	Northanger Abbey "Calendar" Illustrations for the

Jane Austen Timeline

A JANE AUSTEN TIMELINE

1795 *Elinor and Marianne* written, an epistolary work (novel written in letters). *Lady Susan* possibly also written at this point.

1796 (Oct.) *First Impressions* (later to become *Pride and Prejudice*) begun.

1797 (Aug.) *First Impressions* finished.
(Nov) *Sense and Sensibility* begun, revision of *Elinor and Marianne*.
First Impressions rejected, sight unseen, by Cadell (publishing firm).

1797/98? *Susan* (later revised as *Northanger Abbey*) written.

1801 Austen moves with family to [Bath](#), which she hates; beginning of supposed fallow period.

1803 *Susan* sold to Crosby and Co. (publishers), never published by them, however.

1805 Austen's father dies, she perhaps writes *Lady Susan* now and starts on *The Watsons*, unfinished at her death.

Picasso Interactive Syllabus Image Gallery

					
Absinthe Drinker...	Au cafe, 1901.jpg	Blue Nude, 1902.jpg	Blue Room.jpg	Child with a Dove...	Jane Sabarte.jpg
					
La mujer de andaluz...	La soupe, 1902.jpg	Le Gourmet.jpg	Old Beggar with...	The Old Guitarist...	The tragedy, 190...
					
Two Sisters.jpg	Woman of Majorca...				

Imperialism Interactive Syllabus

<p>Week 7 The British Raj</p>	<p>Ainslie T. Embree, "India"</p> <p>Lord Macaulay on Empire and Education</p> <p>George Orwell, "Shooting an Elephant" (1936)</p> <p>Saadat Hasan Manto, "Toba Tek Singh"</p> <p>Slide Show: India in the Nineteenth Century</p> <p>Slide Show: India Under British Rule</p>	<p>Interactive map of India</p> <p>Statistical profiles of the states</p> <p>The beginning of the British Raj</p> <p>Bibliography on British rule</p> <p>Indian History Sourcebook</p> <p>The British in India</p> <p>The East India Company</p> <p>British India</p>
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Mozart Interactive Syllabus



Mozart's Musical Magic

TOPIC	READINGS/LISTENING	RESOURCES
<p>Week 1 Mozart and Classicism</p>	<p>The Mozart Project</p> <p>Mozart's Early life</p> <p>About the Köchel Catalog</p> <p>Overture, <i>Il re pastore</i>, K. 208</p> <p>Il re pastore, (K. 208) [Real Audio]</p>	<p>The Mozart-Weber Family Tree</p> <p>Biography</p> <p>Catalogue of Mozart's Works</p> <p>Chronology, 1761-1765</p> <p>Chronology, 1766-1770</p> <p>Chronology, 1771-1775</p> <p>Chronology, 1776-1780</p> <p>Paris and London, 1763-66</p>
<p>Week 2 First Opera</p>	<p>Score for <i>The Abduction from the Seraglio</i></p> <p>Overture from <i>The Abduction from the Seraglio</i></p> <p>Excerpt from aria: "O wie ängstlich, o wie feurig" Stuart Burrows, tenor</p> <p>"Sind den armen Pappa Lieder" Chor.</p>	<p>Chronology, 1781-1785</p>

Picasso Interactive Syllabus

TOPIC	READINGS/VIEWINGS	RESOURCES
WEEK 1: INTRODUCTION Portrait of the Artist	View video on Picasso's creative life The Interactive Picasso Timeline of his Life, Works, and Influences	Interactive timeline of world events surrounding Picasso's life Map of Europe in 1900
WEEK 2 The Blues	View the Gallery	About the Blue Period The Blue Period in stamps
WEEK 3 "La Vie en Rose"	Picasso's Harlequins View the Gallery	A panoramic view of Montmartre Map of Europe in 1914
WEEK 4 A Defining Moment: <i>Les Femmes d'Alger</i>	Les Femmes d'Alger View the Gallery	About the painting Les Femmes and Cubism African Art and Cubism

Picasso Contextual Timeline

The Rose Period Paris 1904-1905	1905 Meets the poet Guillaume Apollinaire, and Leo and Gertrude Stein 1905 School Holland	1905 " <i>Les Femmes</i> " named, Paris Alfred Stieglitz opens "291" on 5th Avenue in New York City Marinetti " <i>Futurist Manifesto</i> " Abortive revolution in Russia Einstein " <i>Special Theory of Relativity</i> " Freud " <i>Three Essays on the Theory of Sexuality</i> "	1904 <i>Roman with a Crow</i> 1905-1910 <i>Pepe People on the Seashore</i> 1905 <i>Circus Family</i> 1905 <i>Portrait of Benedetta Canals</i> 1905 <i>Acrobat and Young Harlequin</i> 1905 <i>Lady With a Fan</i>	Gertrude Stein (writer) Guillaume Apollinaire Leo Stein Andre Salmon (<i>Portrait by Marie Laurencin</i>) Albert Einstein Ernst Hemingway
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Picasso and the World Timeline

The World During Picasso's Lifetime

1881: Germany, Austria-Hungary, and Italy form the [Triple Alliance](#)

1881: [Alexander II](#) is assassinated by the radical group, the People's Will; [Alexander III](#) follows him and is very reactionary

1885: [Berlin Conference](#) over African colonization: Congo under control of Belgium, and a country must have a presence in the territory they claim in Africa

1887: Germany and Russia sign a [Reinsurance Treaty](#) to improve relations

1888: Wilhelm I dies and is succeeded by Friedrich III who dies shortly and is then succeeded by [Wilhelm II](#) who rules until 1918

1889: Second International meets to discuss socialism every 3 years, lasts until 1914

1890: Wilhelm II dismisses [Bismarck](#) as Chancellor, hurting Germany's foreign relations in the next years

1890: Alfred Mahan publishes [The Influence of Sea Power Upon History](#), led to a build-up of naval power