Collective Learning Paradigm for Rapidly Evolving Curriculum: Facilitating Student and Content Engagement via Social Media

Nitin Agarwal

Information Science Department

University of Arkansas at Little Rock

Little Rock, AR, USA 72204

nxagarwal@ualr.edu

Faysal Ahmed

Voice Network Operations Center

Windstream Corporation

Little Rock, AR, USA 72211

Faysal.Ahmed@windstream.com

ABSTRACT

Curriculum in the information systems discipline has been rapidly evolving. This is not only challenging for the instructors to cope with the velocity of change in the curriculum, but also for the students. This paper illustrates a model that leverages the integrated use of social media technologies to facilitate collective learning in a university teaching/learning environment. However, the model could be adapted to other organizational environments. The model demonstrates how various challenges encountered in collective learning can be addressed with the help of social media technologies. A case study is presented to demonstrate the model's applicability, feasibility, utility, and success in a senior-level social computing course at the University of Arkansas at Little Rock. An evolving, non-linear, and self-sustaining wiki portal is developed to encourage engagement between the content, students, and instructor. We further outline the student-centric, content-centric, and learning-centric advantages of the proposed model for the next generation learning environment.

Keywords

Collective learning, social media, wiki, classroom learning, team learning.

INTRODUCTION

Due to the rapidly evolving nature of the information system technologies, topics in the courses pertaining to programming languages, database technologies, social computing, among others within the information system curriculum need to be updated almost every semester. Consider the history of the web programming languages. There are almost a dozen popular computer languages in use since the year 2000, e.g., ActionScript, C#, Visual Basic .NET, F#, Groovy, Scala, Factor, Closure, Go, Dart, Ruby, etc. There are many more programming languages that are not as popular as others. This is not only challenging for the instructors to cope with the velocity of change in the curriculum, but also for the students to find their skill set obsolete when they graduate. Therefore it is imperative that the curriculum is adaptive and up-to-date. Further, the curriculum must also equip the students with lifelong learning capability so that they can educate themselves during their professional careers. When newly graduated computer programmers join a dynamically changing workplace after graduating from school, they face new challenges. Employer requires them to learn new skills (e.g., programming language, data analytics, data management, etc.) to perform daily tasks. At this point, learners do not have a formal educational environment, such as a classroom education, where teachers will teach them the new skills.

Several studies have reflected that individual learning, which has been a core component around which the education system has been institutionalized, does not fully enable learners to learn the process of learning (Salomon and Perkins, 1998). It has been observed that people learn faster and in much greater depth in groups, making them familiar with the process of learning. Group learning encourages students to engage in the learning process starting from academics to real-life work environment. The interpersonal communication skills that students develop in group learning environments are particularly helpful in organizations that are increasingly emphasizing on teamwork. Learners practice and exercise collectively on a topic in teams. In the group, students engage in discussions and motivate each other. Collectively, team can discuss, find answers to questions, and contribute in the advancement of the course topics. In addition, a closer engagement with the content enhances their capability to retain the concepts much longer (Ellis, Hollenbeck, Ilgen, Porter, West, and Moon, 2003).

Furthermore, many companies encourage employees to work collectively and collaboratively. For example, Windstream Corporation Inc., a Little Rock, Arkansas based telecommunication company that supports broadband, telephone and data solution for customers, practices team based learning using collaborative technologies at workplace. When the company hires new employees, they organize them in a team and select one lead analyst to guide new hires. New hires collectively learn job skills using collaborative technologies, such as Wikis. New employees help each other in the learning process along the way. So students need to be exposed to group learning and collaborative technologies and develop strong interpersonal

communication skills from their college experiences so that they are better prepared when they join a workplace, where most likely there will be no formal or structured learning environment.

However, such collective learning paradigms requires active participation and cognitive involvement of the learners (Agarwal, 2011). Further, collective learning involves challenges pertaining to planning, structuring, managing, and evaluating. In this study, we focus on social media technology as an enabler for collective learning. This paper would illustrate a model that leverages the integrated use of social media technologies to support collective learning in a university teaching/learning environment. However, the model could be adapted to other work environments. The model demonstrates how various challenges encountered in collective learning can be addressed with the help of social media technologies. A case study is presented to demonstrate the model's applicability, feasibility, utility, and success in a senior-level undergraduate Social Computing course at the University of Arkansas at Little Rock. An evolving, non-linear, and self-sustaining wiki portal is developed to encourage engagement between the content, students, and instructor. The course wiki illustrates the model's ability to encourage students contribute towards the advancements of the course topics. Such a collaborative content enrichment lends multiple perspectives for curriculum development. We further outline the student-centric, content-centric, and learning-centric advantages of the proposed model for the next generation learning environment.

Specifically, we make the following contributions in this paper,
- Developed a collective learning model to cope with the challenges of a rapidly evolving curriculum leveraging social media technologies,
- Implemented the model in a senior-level undergraduate Social Computing course at the University of Arkansas at Little Rock's Information Science curriculum,
- Demonstrated the model's ability to develop a self-sustaining and non-linear wiki for the course,
- Provided methodologies for objective evaluation of student participation assessment in collaborative settings,
- Demonstrated the efficacy of peer evaluation component of the collective learning model, and
- Outlined student-centric, content-centric, and learning-centric advantages of the model for the next generation learning environment.

Next, we will discuss the related literature in this domain.

RELATED WORK

Collective learning is a process where two or more individuals learn in a group environment. They help each other to learn along the way, which is mutually beneficial for them. Collective learning has been useful in explaining diverse phenomena in educational environment. Social media platforms are known to be well suited for collaborative processes. Further, statistics show that majority of students use social media in their daily life and 90% of them prefer to use social media in the classroom (Wolfe, 2007). However, to be able to use social media in the learning environments there is a need for good quality control measures. Wiki is one of the popular collaborative technologies, however challenges pertaining to vandalism have affected its adoption as an industry-wide standard because of its openness and low barrier to publications (Hasan and Pfaff, 2006). One of the solutions to address vandalism is using Statistical Language Modeling (SLM) (Chin Street Srinivasan Eichmann et al., 2010). Other tools to check content quality and readability in wiki include, Automatic Essay Scoring (AES) and Gunning-Fox Index (Agichtein, Castillo, Donato, Gionis, and Mishne, 2008). Additionally, Twitter (a microblogging website) has been experimented with in collaborative learning (Grosseck and Holotescu, 2008). Twitter can be used for educational activities such as organizing ideas, sending notes, managing meet ups and collaborating with others. More importantly, Twitter can help learners to improve editing skills.

Next generation of students form a big part in current educational system. It is very important to know their learning styles. They prefer to know "Where to find the information?" rather than "How does it work?". Next generation learning strategies include team-based learning in classroom, engagement of teachers and students in the learning process, and their understanding of new digital technologies (Ivanova and Ivanova, 2009). Students use digital interactive media such as videos, interactive television, social media, etc. for content generation in learning process (Claros and Cobos, 2012). Mobile phones and smart handheld devices are gaining traction in classrooms. Mobile phone facilitates active learning in classroom. Some of the uses of mobile phone are SMS and photo MMS. SMS can be used for multiple choice, short answer problems and photo MMS can be used to send notes by photo messaging (Lindquist, Denning, Kelly, Malani, Griswold, and Simon, 2007).

Next, we will discuss the proposed collective learning model.

COLLECTIVE LEARNING MODEL

For constantly evolving disciplines it is not only imperative for students to learn the fundamentals, but also get acquainted with the process of learning. The proposed model encourages students to be 'free agent learners' (Nagel, 2009) and impart

lifelong learning capabilities to cope with evolving disciplines. Further, instructors often find themselves constantly developing, maintaining, and evaluating the subject (Finlayson, Cameron, and Hardy, 2009). Towards this direction, the paper proposes to leverage various learning paradigms, such as 'learning by doing' (Newland, Agunias, and Terrazas, 2008), active learning (Bonwell and Eison, 1991), and collaborative learning (Jacques, 2000; Cockrell, Caplow, and Donaldson, 2000), to promote an active participation and cognitive engagement with the material. This enhances the students' capability to familiarize with the process of learning and their ability to retain the material much longer making it a formative experience. The process simultaneously contributes to the advancement of the educational content and keeps it up-to-date. Further, educational material benefits from multiple perspectives via collaborative content enrichment.

To accomplish research objectives, the proposed model is implemented using an evolving, non-linear, and self-sustaining wiki. In the collective learning model, every course module has a core component and an extended component. The learning is, therefore, accomplished in two phases: **Phase 1** (also known as the conceptualization phase), where core components are learned and updated, and **Phase 2** (also known as the experience, reflection/observation, and application phase (Kolb, 1984)), where extended components are developed. The collective learning model is illustrated in Figure 1, which is adapted from our earlier work presented in (Agarwal, 2011). Below, we explain each phase in detail.
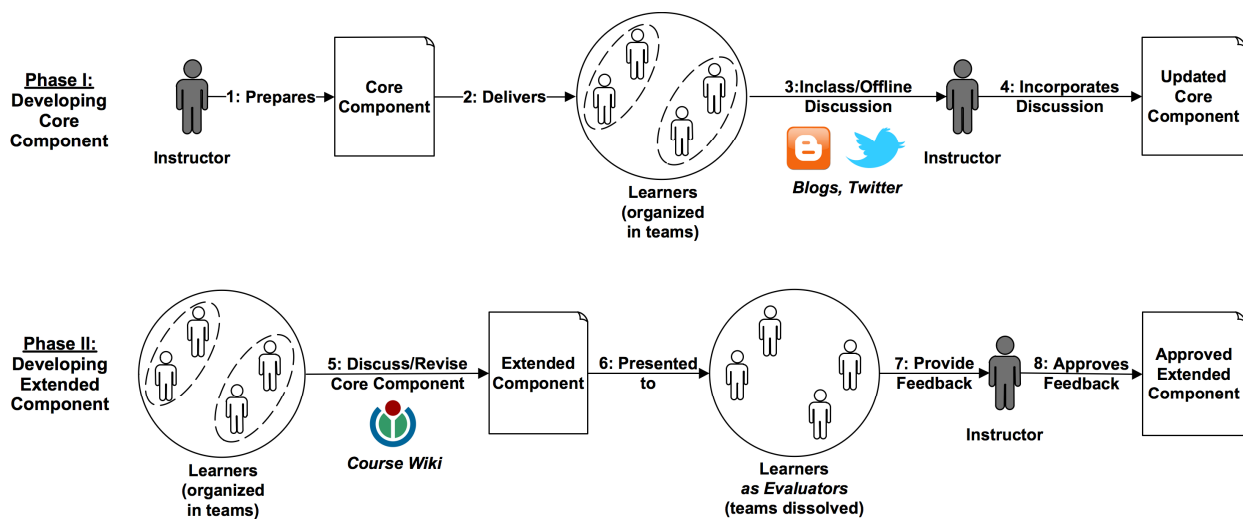

Figure 1. Leveraging Social Media in Developing Core and Extended Components of Various Course Modules. The Sequence of Activities Involved in the Two Phases is Depicted by Number Prefixes

Phase 1: *Developing core component* involves the instructor to prepare the fundamental instruction material or the core component. The instructor prepares the teaching material (step 1) and delivers it to the students (step2). Students can comment, ask questions, get help (by the peers or the instructor), rate questions and answers, and post additional resources. The discussion could be organized in-class or offline using social media, such as blogs, Twitter, TodaysMeet, HotSeat (also known as backchannels), etc. (step 3). Coordinating discussion via social media would help students shed inhibitions about voicing opinions (Kolb, 1984). The instructor could possibly update core component by incorporating the discussion (step 4) and make it available to the students. Asking or answering questions, rating responses, class participation, and other forms of positive behavior (e.g., submitting assignment before it is due) could be rewarded with points and customized virtual badges using functionalities provided by social media platforms. Students can track their participation level through leader boards, thereby encouraging a participatory and collaborative learning environment. Further, the data would help understand learning behavior and drive performance.

Phase 2: *Developing extended component* involves learners, organized in teams, to discuss/revise core component (step 5). In this step, students reflect over concepts (via blogs, Twitter) and discuss their possible applications (via in-class exercises). Students contribute towards advancing the basic educational content to extended component. This will be coordinated using the course wiki. Wiki provides easy collaborative access to all the team members with the facility to rollback to any previous version. Active participation and cognitive engagement with the educational material would be required from the students thereby familiarizing them with the process of learning. Teams then present the advanced educational content in the extended component to fellow students and instructor to facilitate peer-review (step 6). Instructor compiles all the reviews and scores from the students (step 7), suggest necessary changes to the respective teams, and approves the revision (step 8) to create an

approved extended component. Other collaborative learning platforms, such as Teamie (Teamie, 2013) would be explored to facilitate coordination.

CASE STUDY IN SOCIAL COMPUTING COURSE

In this section, we present a case study to demonstrate the model's applicability, feasibility, utility, and success. The case study was conducted in a senior-level undergraduate course Social Computing (IFSC 4360) in the university environment (University of Arkansas at Little Rock). The aim was to collaboratively develop a comprehensive article on social media technologies. Students were given a basic lecture on social computing concepts as a part of conceptualization phase (steps 1-4 of the proposed model in Figure 1). Course blog was setup to answer student queries concerning the lectures. Students were then asked to form teams and research and reflect on social computing concepts. During second phase they were asked to explore the core concepts and prepare extended components (steps 5). Students then presented their findings that were peer assessed (steps 6). The feedback from the peer assessment was used by the teams to improve their submissions and shared it on the course wiki. The collaboration was not only confined within a team but also spanned across multiple teams. Screenshots of one such extended component on the "State of Social Media" are shown in Figures 2. Based on the students' feedback, their experience with social media technologies was fruitful. Students were more actively and enthusiastically involved in the exercise. Collaboration within team and across teams was made simpler using Wikis. Further, at a larger scale, students were observed to be more behaviorally active in the class. Some students were not as expressive in-class as they were on course blogs and gradually became less hesitant during in-class discussions.

	1 – (Novice)	2 – (Apprentice)	3 – (Proficient)	4 – (Distinguished)
Content quality of the article				
Organization/ Structural quality of the article				
Clarity of the article				
Knowledge of the topic reflected by the team				
Extent to which key issues were identified				
Attention to level of details				

Table 1. Assessment Rubrics for the Educational Content developed by the Collaboration

Proposed model was put to test and the outcome was evaluated according to the collaborative evaluation plan (Figure 1). There were 18 students in the class who were organized into 9 teams of two students each. For each team, two simultaneous evaluations were performed. One was performed by the instructor and the other was performed by the peers using the rubrics mentioned in Table 1. The peer evaluations were then averaged for each of the six dimensions. Essentially each team was evaluated by 16 students and the instructor on 6 dimensions mentioned in the rubrics in Table 1. Finally, a cumulative evaluation for the teams both for the peers' and instructor's evaluation is computed by averaging the evaluation scores for all the six dimensions. The evaluation results are presented for each of the six dimensions in Figures 3(a)-(f). The cumulative evaluation averaged on all the dimensions is shown in Figure 4. The correlation between students' and instructor's evaluation is shown in Figure 5. It can be observed that the proposed collaborative assessment strategy is effective due to a high correlation value ($R^2 = 0.9732$) between instructor and peer evaluation scores. This demonstrates that not only the proposed collective learning based model enriched learners' experience through social media but also helped in effective evaluation. The model exhibits an empirical analysis and a methodology to develop a strong foundation of collective learning leveraging social media.

MyWikkaSite : SocialMediaReport
HomePage :: Categories :: PageIndex :: RecentChanges :: Recently
:: Change settings/Logout :: You are admin

What is Social Media?
Social computing is a multi-disciplinary research program that focu
human, cultural, and behavioral aspects. It brings together experts
various disciplines like: anthropology, cognitive science, computer
economics, linguistics, mathematics, neuroscience, political scienc
psychology, sociology, statistics, and theology. Social computing r
intersection of social behavior and computational systems. Social
is often defined as modeling complex human interactions that are
on a variety of social media. Social media, or commonly known as
Web, consists of an ant-colony of services including blogs, media s
micro blogging, social bookmarking, social news, social friendship
websites, and wikis. Different social media sites could be alike or
terms of functionality. We briefly describe each category and the
functionalities:
Different categories of social media:
- Social Networks
- Media Sharing
- Blogging
- Microblogging
- Virtual World
- Social News
- Social Bookmarking
- Opinions and Ratings

MyWikkaSite : MediaSharing
HomePage :: Categories :: PageIndex :: RecentChanges :: Recently
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Edited by: Eric, Tara, Tyler, Yoann

Definition of Media Sharing
Wikipedia states, "media sharing occurs in online social networks
communities with a comprehensive platform and diversified interfa
aggregate, upload, compress, host and distribute images, text, ap
videos, audio, games and new media. It is the interactive process
via email, instant message, text message, posting or linking to me
website or blog and other methods of sharing media to a targeted
As media is shared, it takes on a variety of different contexts and
The same video posted on YouTube and on Digg will generate diffe
communication outcomes as the same video being sent to a family
and a college buddy. Social commentary usually accompanies shar
Media sharing sustains social networks, web based communities a
digitally supported relationships. It is a communication process tha
the participation of both the sender and receiver."
(http://en.wikipedia.org/wiki/Media_sharing)-Tyler

History
What started as simply sharing your photo album with family and
the couch has transformed into the extremely popular phenomeno
has media sharing on the internet. Media sharing is essentially the
and viewing of different types of media, such as pictures and vide
However, the media sharing phenomenon is comparatively recent,

(a) Main page   (b) Sample entry
Figure 2. Collaboratively Developed Article on Social Media Technologies using Collective Learning Model
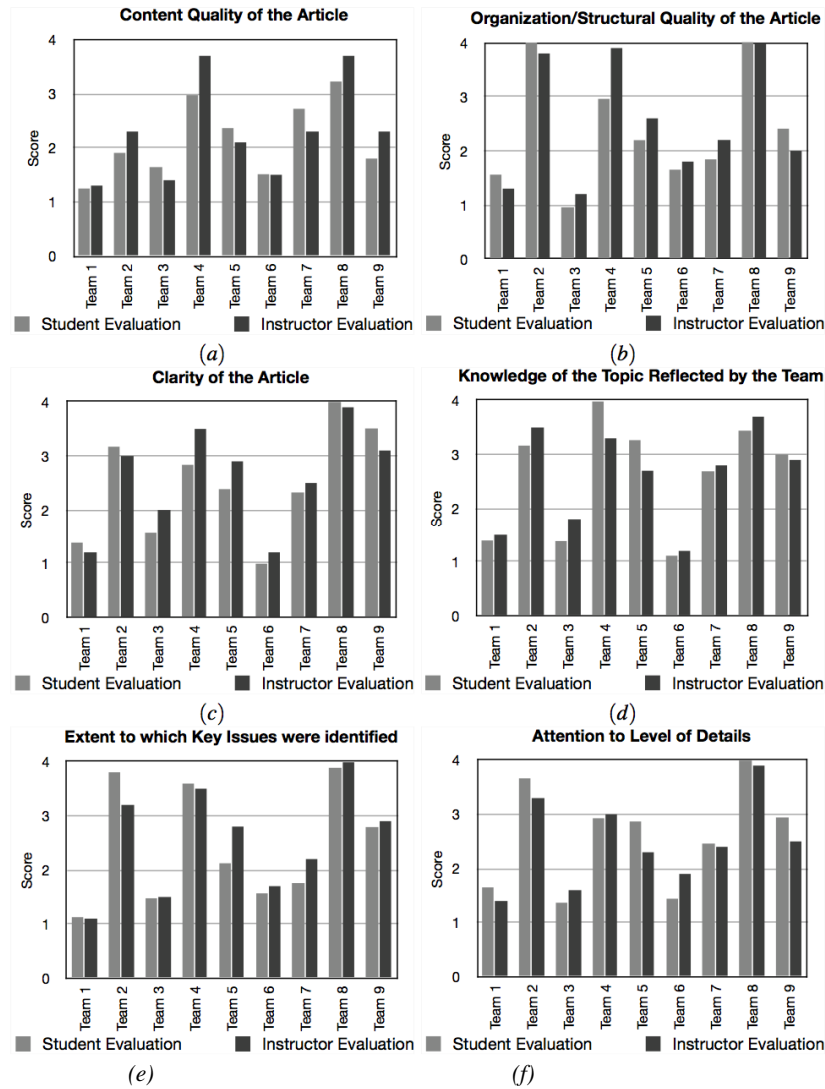
Figure 3. Collaborative Assessment of the Material and Evaluation of the Students based on the Proposed Collective Learning Model using the Rubrics in Table 1
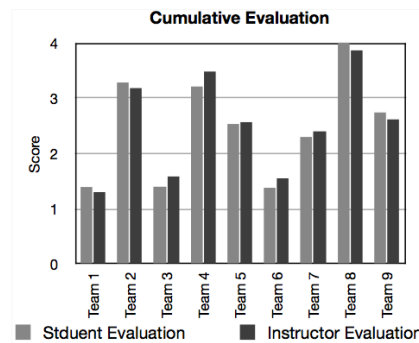

Figure 4. Cumulative Evaluation Scores for each of the Nine Student Teams Averaged on all the Six Dimensions
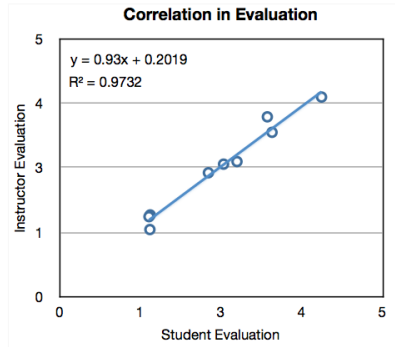
Figure 5. Correlation Between Students' and Instructor's Evaluation Scores

The following figures (Figure 6 through Figure 11) are good examples of collaborative learning outcomes using the proposed collective learning model. Through these figures we demonstrate a methodology for the instructors to objectively evaluate students' contributions using features from one of the most widely used learning management systems, i.e. Blackboard. Instructors can determine how students are collaborating on their respective contributions through the article modification. Figure 6 shows the collaboration between two students on the course wiki on the topic "Social Games / Virtual World". It is displayed in version 2 and version 3 that a student modified other student's work. In this figure, words highlighted in red are deleted words and green highlighted are added words in the article. Figure 7 depicts the legend of these edits. It shows text removed, text added and text changed with highlighted blue with underline. In Figure 8, history of the edits on the article is displayed from version 1 to version 10. In addition to this, page history is showing the student that modified the topic, the time it was created and the versions of each modified work in details. So the instructor can find out the students who were working on the topic. Instructor can evaluate students by looking at Figure 8. It is important to see how student collaboration improved the state of the article through different versions. Figure 9 shows the first version of the article. If we look at the final version of the article in Figure 10, we can observe that the article is now well organized, informative, and very resourceful. This demonstrates that the collaborative editing is helpful in improving the quality of the article. Figure 11 shows the participation summary of collaborative work of the students. This summary can be used by the instructors to objectively evaluate the students' contributions and grade their efforts. The various attributes that are displayed include number of words edited, percentage of edits made in the article, number of pages edited, and the percentage of pages edited. In participation summary of Figure 11, one student modified over 5000 words that amounts to 32% of total modifications in the article. This is a good indicator to assess students' level of contributions.

○○○   Page Comparison

🔒 https://blackboard.ualr.edu/webapps/Bb-wiki-BBLEARN/pageDiff?course_id=_52826_1&wiki_id=_4931_1&page_guid=0716fb535e6b484982ceeed1a7ac90c4&version=3

Page Comparison

Use the Legend tab to understand how one version was changed in comparison to the other version of this Wiki page.

Comparison Details   Legend

Version:	2		Version:	3
Page Title:	Social Games/Virtual World		Page Title:	Social Games/Virtual World
Created On:	2/1/13 8:31 PM		Created On:	2/3/13 11:30 PM
Author:			Author:	
Size:	5.13 KB		Size:	9.98 KB

Social Games/Virtual World

Virtual worldsWorldsand "Social games"Games"
A virtual world in it's purest sense is nothing more than an artificially created digital environment. Although there are certain lowe: limits to what classifies a "world" in that it must have at least some visual aspect to it, or a way for us to perceive it. This means that a virtual world could be as simple as a text based game that describes the world in text, and leaves the player to visualize it in their minds. A virtual world does not have to be a game though: A realistic simulator that has the purpose of training astronauts for problems in lift off for a space shuttle is certainly a virtual world, but would not be considered a game by many.

The term "Social game" on the other hand is much more difficult to pin down. Social gaming is defined as games that are played for social interaction. All multiplayer games have a social aspect since multiple people interact, however does this make them a "social game"? This depends on the person you talk to since the term could either mean all multiplayer games, or a game specifically designed around social elements not common in ordinary game mechanics.
History of multiplayer "Virtual worlds"
 Social gaming has evolved over the years, and are now commonly used to describe social network games, which is defined as an online game that is played over a social network.

History of Multiplayer "Virtual Worlds"
In the early days of virtual worlds in the form of games, we could see a few classic multiplayer games such as pong. Pong is one of the simplest of games that most people can remember, and it could arguably be stated as the beginning of multiplayer interactive games. Before the spread of inter-connectivity to the masses, games that were multiplayer were limited to the capabilities of the machine running them. This often limited games to 2–4 players with a few exceptions. This type of social gaming was often done with family or friends, and hardly involved interaction with people outside the person's familiarity.
When internet connectivity became widespread enough throughout the world, a few games started to have multiplayer capability over the internet instead of local connections. This allowed for complete strangers to play in a virtual world together, and created generations after that would become accustom to this.

The first group of known social network games started in the 1970s. Better known as MUD (multi user dungeons) games, they were text based games that first allowed multiple users to play in real time with each other.
It was not until the creation of the first popular massively multiplayer online games that multiplayer gaming became less of random player interactions, and started to form communities. MMOs allowed for people to have a persistent virtual world to play in in which they could form their own social groups. As such games became more popular, the social groups within these games grew larger and larger to eventually create large social media networks within the game and even outside of the game. Modern MMOs often have large social groups of hundreds to thousands of people which all share enough in common to hold the group together.

As social networks evolved, games like Farmville which are mostly single player in nature, yet also have multiplayer elements became extremely popular. The core elements of Farmville are single player, but activities in the game can be reflected with social media tools. Although social media integration is not direct player interaction, it is still a notable way of sharing the experience of the game and creating a somewhat persistent virtual world.
Farmville, which was free to play, made money through micro-transactions. This means that people pay only for exclusive items in game (a freemium model). It rewarded people who play daily, and invited more people to play with them. From here, most social games use the freemium model to fund new projects and make money.

The Pros and Cons of Social Games
        Social games connect people in a different way than social networks in general. It can be accessed from anywhere. It allows anyone and everyone to play a game, from parents, to kids can be something to build connections to with other people, building up your game alongside them. People communicate more when there is a mutual connection that they enjoy. Advertiser use them to promote business.
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        Organic foods markets are currently collaborating with Farmville to provide "Farm Cash", cash users have to buy using real money, to players who shop at their stores.

A big disadvantage that social games play in people's lives, is that it can cause a strain in relationships in real life. These games can be very addictive, and can cause users to prefer to play games over other activities. Users sometime prefer to interact over social games instead of in real life. Many now require users to exploit their friends to grow in game. Also, more and more corporations use social games to take information from social networks. Playing social games will sometimes force the user to grant the games access to their personal information and to post ads without their knowledge on their social network.

The Future of Social Games
There is a lot of speculation as to the future of social gaming. There are many that believe that the bubble will eventually burst and collapse, while others believe that the "Golden Age" of social games have come and gone, and that a plateau has been hit. However, the immediate future of social gaming seems to be heading into the direction of mobile apps. More people are getting smartphones every day, and would like to play their games on the phone. Since a user can't access the majority of games on the phone, developers are starting to create mobile apps to be the gateway that access their online account.

Figure 6. Page Comparison by Participants - An Example of Student Collaboration in Wiki
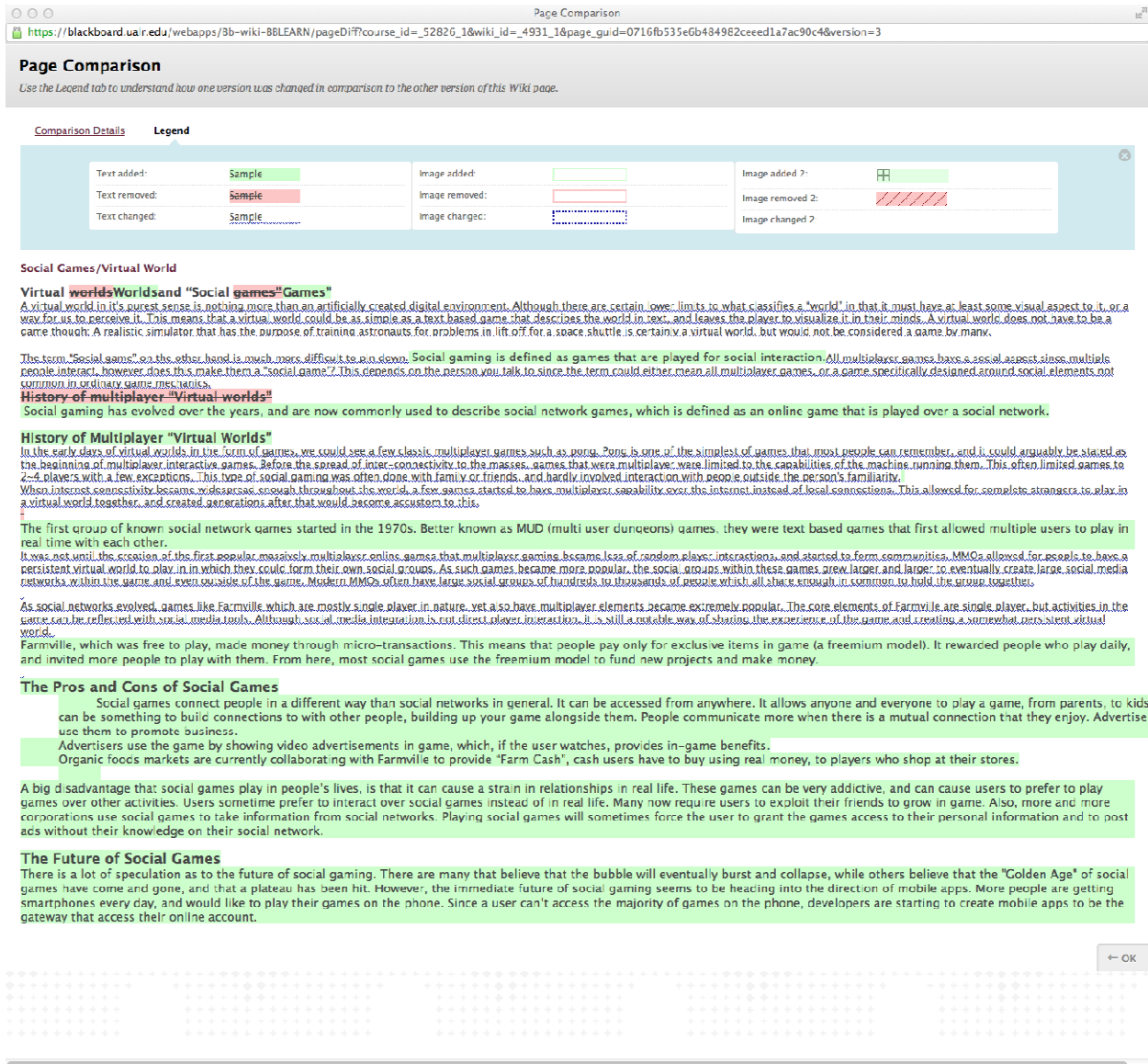
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Comparison Details   **Legend**

Text added:	Sample	Image added:		Image added 2:	
Text removed:	Sample	Image removed:		Image removed 2:	
Text changed:	Sample	Image changed:		Image changed 2	

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← OK

Figure 7. Legend for Page Comparison

Figure 8. Page History for Different Time Periods
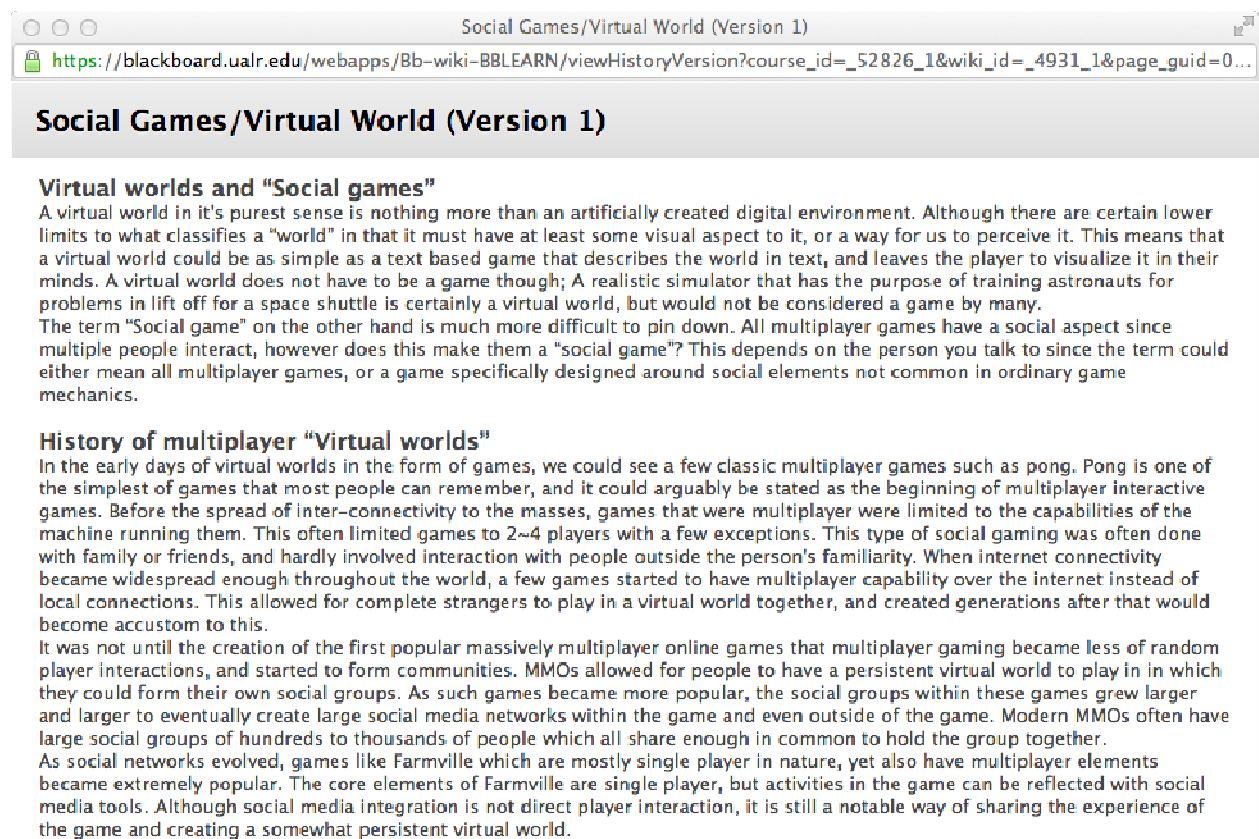
Figure 9. Version 1 of the Page on Social Games/Virtual World

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○ ○ ○   Social Games/Virtual World (Version 10)

🔒 https://blackboard.ualr.edu/webapps/Bb-wiki-BBLEARN/viewHistoryVersion?course_id=_52826_1&wiki_id=_4931_1&page_guid=0716fb535e6b484982ceeed1a7ac90c4&page_version=10

Social Games/Virtual World (Version 10)

Virtual Worlds and "Social Games"

A virtual world in it's purest sense is nothing more than an artificially created digital environment. Although there are certain lower limits to what classifies a "world" in that it must have at least some visual aspect to it, or a way for us to perceive it. This means that a virtual world could be as simple as a text based game that describes the world in text, and leaves the player to visualize it in their minds. A virtual world does not have to be a game though; A realistic simulator that has the purpose of training astronauts for problems in lift off for a space shuttle is certainly a virtual world, but would not be considered a game by many.

The term "Social game" on the other hand is much more difficult to pin down. Social gaming is defined as games that are played for social interaction. All multiplayer games have a social aspect since multiple people interact, however does this make them a "social game"? This depends on the person you talk to since the term could either mean all multiplayer games, or a game specifically designed around social elements not common in ordinary game mechanics. Social gaming has evolved over the years, and are now commonly used to describe social network games, which is defined as an online game that is played over a social network.

History of Multiplayer "Virtual Worlds"

In the early days of virtual worlds in the form of games, we could see a few classic multiplayer games such as pong. Pong is one of the simplest of games that most people can remember, and it could arguably be stated as the beginning of multiplayer interactive games. Before the spread of inter-connectivity to the masses, games that were multiplayer were limited to the capabilities of the machine running them. This often limited games to 2-4 players with a few exceptions. This type of social gaming was often done with family or friends, and hardly involved interaction with people outside the person's familiarity.

When internet connectivity became widespread enough throughout the world, a few games started to have multiplayer capability over the internet instead of local connections. This allowed for complete strangers to play in a virtual world together, and created generations after that would become accustom to this. The first group of known social network games started in the 1970s. Better known as MUD (multi user dungeons) games, they were text based games that first allowed multiple users to play in real time with each other. It was not until the creation of the first popular massively multiplayer online games that multiplayer gaming became less of random player interactions, and started to form communities. MMOs allowed for people to have a persistent virtual world to play in in which they could form their own social groups. As such games became more popular, the social groups within these games grew larger and larger to eventually create large social media networks within the game and even outside of the game. Modern MMOs often have large social groups of hundreds to thousands of people which all share enough in common to hold the group together.

As social networks evolved, games like Farmville which are mostly single player in nature, yet also have multiplayer elements became extremely popular. The core elements of Farmville are single player, but activities in the game can be reflected with social media tools. Although social media integration is not direct player interaction, it is still a notable way of sharing the experience of the game and creating a somewhat persistent virtual world. Farmville, which was free to play, made money through micro-transactions. This means that people pay only for exclusive items in game (a freemium model). It rewarded people who play daily, and invited more people to play with them. From here, most social games use the freemium model to fund new projects and make money.

The Pros and Cons of Social Games

Social games connect people in a different way than social networks in general. It can be accessed from anywhere. It allows anyone and everyone to play a game, from parents, to kids. It can be something to build connections to with other people, building up your game alongside them. People communicate more when there is a mutual connection that they enjoy. Advertisers use them to promote business. Advertisers use the game by showing video advertisements in game, which, if the user watches, provides in-game benefits. Organic foods markets are currently collaborating with Farmville to provide "Farm Cash", cash users have to buy using real money, to players who shop at their stores.

A big disadvantage that social games play in people's lives, is that it can cause a strain in relationships in real life. These games can be very addictive, and can cause users to prefer to play games over other activities. Users sometime prefer to interact over social games instead of in real life. Many now require users to exploit their friends to grow in game. Also, more and more corporations use social games to take information from social networks. Playing social games will sometimes force the user to grant the games access to their personal information and to post ads without their knowledge on their social network.

The Future of Social Games

There is a lot of speculation as to the future of social gaming. There are many that believe that the bubble will eventually burst and collapse, while others believe that the "Golden Age" of social games have come and gone, and that a plateau has been hit. However, the immediate future of social gaming seems to be heading into the direction of mobile apps. More people are getting smartphones every day, and would like to play their games on the phone. Since a user can't access the majority of games on the phone, developers are starting to create mobile apps to be the gateway that access their online account.

Figure 10. Version 10 of the Page on Social Games/Virtual World

Participation Summary

Each user's contributions to the Wiki are represented by **Words Modified** and **Page Saves**. If the Wiki is gradable, the particip
name. More Help

Name △	Words Modified (Number Count)	Words Modified (Percentage)	Page Saves (Number Count)	Page Saves (Percentage)
	575	3%	2	2%
	5	0%	1	1%
	2318	13%	17	18%
	5453	32%	7	7%
	1270	7%	9	9%
	2555	15%	4	4%
	21	0%	6	6%
	224	1%	10	10%
	5	0%	3	3%
	898	5%	6	6%
	10	0%	2	2%
	1218	7%	25	26%
	2242	13%	2	2%

Figure 11. Participation Summary for the Extended Component on the State of Social Media

BENEFITS OF USING COLLABORATIVE LEARNING MODEL

The proposed model leverages a collective learning approach via an orchestrated set of social media tools to – promote and sustain interaction and participation within and outside the classroom; familiarize students with the process of learning through reflection/exploration/application and help students to cope with constantly evolving technologies. The outcomes of the model include, the model itself; collaboratively developed social computing course wiki; assessment instruments, evaluation data, and findings; guidelines and case studies for integrating social media in education to facilitate collective learning. These strategies could be helpful in various disciplines and in different learning environments. The course wiki could assist in creating a similar course or reuse modules in courses in other disciplines, such as sociology, communication and journalism, business administration, among others. The merits of the collective learning model, categorized under student centric, content-centric, and learning-centric, are outlined below.

Student-centric merits can be summarized as follows,

• The proposed model and wiki-based collaborative content development encourages critical thinking, participatory learning, and team building among students.

• Networked representation of knowledge in wiki supports the vision of natural learning to assist contextual understanding and accommodating psychological and cognitive variations in students' needs.

• Intricate concepts can be explained in a comfortably conceivable terminology through students' reflections, creative expressions, and discussions (via blogs, tweets, and wiki). This encourages the next generation engineers to develop new powerful ways to communicate science with people by leveraging social media.

• Benefits of the proposed wiki-based learning approach stretch beyond the realms of academia. In addition to encouraging teamwork, collaborative learning approaches are extremely helpful in organizations, where employees are expected to explore, experience, and educate themselves new technologies without formal training. In the ICT industry, where new technologies emerge frequently and quickly obtain industry-wide recognition, collective learning approaches could be helpful for our students. By emphasizing on the process of learning and encouraging the students to be 'free agent learners', the model helps train the next generation workforce.

Content-centric merits can be summarized as follows,

• Collaborative content development lends multiple perspectives to the instruction material.
• Collaborative content development through wiki is well suited for fast-changing courses, such as social computing, where concepts evolve in a 'perpetual beta' model.
• Networked representation of concepts in the wiki lends itself as a possible mechanism to ensure content quality.

Learning-centric merits can be summarized as follows,

• The proposed model and collaborative content development encourages active participation and cognitive engagement with the material resulting in a formative experience.
• The collective learning, leveraging social media, is highly adaptive to online or e-learning environment. Further, the model will help evaluate the challenges and opportunities of the emerging social learning paradigm, where social media technologies are combined with education to understand learning behavior and drive performance.

CONCLUSION

As the emphasis is shifting towards learning to learn putting the onus of learning on the learners, new ways of experimental learning have been explored. Another upcoming technology is the social media where content generation is shifting from a few producers to the consumers. The Web 2.0 paradigm has promoted collaborative content development. We attempt to blend these two significant paradigm shifts and explore their impacts on learning. Specifically, we proposed a collective learning model that leverages the integrated use of multiple social media. The advantages of the model including a built-in collaborative assessment strategy to evaluate the merit of the educational content are highlighted. Based on our findings of the proposed model, learning should not be compartmentalized rather it should be more open. A case study is presented to demonstrate the model's applicability, feasibility, utility, and success.

Collective learning model has shown a great potential based on our evaluation. Students tend to embrace the social media technologies much faster and gladly incorporate in the learning environment. This is precisely the reason why all the social media technologies do not have a user manual and still people are able to grasp them quickly. They see, they learn. Some students are not as orally expressive as they are in writing. The quietest of the students have often been the most active on Twitter and the class blog and gradually have become less hesitant during in-class discussions.

As future direction, there would be further exploration of the proposed collective learning model both nationally at various US universities and internationally at the University of Auckland in New Zealand in Information Systems and Operation Management class. Students' learning experiences will be further evaluated in terms of content engagement, content absorption, in class interaction, online interaction, comfortability with collaborative learning model, fidelity with collaborative learning model, trustworthiness of the content, comfortability with social media, and fidelity with social media.

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