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## USING YOUTUBE© AS AN INNOVATIVE TOOL FOR COLLABORATIVE LEARNING AT UNDERGRADUATE LEVEL IN TERTIARY EDUCATION

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### Abstract:

Using engaging and entertaining learning tools and techniques in and outside the classroom has become imperative in order to ensure, amongst others, subject-matter retention for the scholars of today. These technologies are not restricted to enriching course content alone and can also stimulate and encourage students to participate in collaborative learning processes. In this paper, the use of YouTube © is described to encourage collaborative learning and how this innovative learning tool can enhance students' motivation to gain computer knowledge. The research findings are supported with outcomes from student questionnaires. The research found that integrating YouTube © into undergraduate education will be beneficial for improving Information Systems (IS) knowledge and competence.

**Keywords:** Collaborative learning, YouTube ©, Social Computing, Net Generation

### I. INTRODUCTION

From the time of using technology and the internet for teaching and learning, Information Systems education has been facilitated by the important element of collaborative learning. "We are entering a world in which we all will have to acquire new knowledge and skills on an almost continuous basis." (Brown & Adler, 2008). This study focuses on Information Systems (IS) education which will investigate the use of the YouTube learning tool to facilitate IS education in the Informatics 112 1st year module of the University of Pretoria based on social collaborative learning principles.

The concept of social learning is the creation of understanding through interaction. Social learning focuses on the 'how' rather than the 'what' of education and emphasizes the need for students to be able to participate in study groups and the interchange of knowledge. There are a number of clear benefits to a social learning environment that cannot go unnoticed, one obvious benefit being that students are able to enter into a comfortable and non-threatening "peer learning environment" where they can clarify uncertainties while taking hold of the material more easily by asking questions and acquiring different views from fellow students (Brown & Adler, 2008).

The main inspiration for this paper is the research and analysis of an innovative method of learning, being the use of YouTube for group work, which has been applied for the first time in the Department of Informatics at the University of Pretoria. In view of the fact that this is the first year that the University has applied this innovative and technologically advanced learning method, the research is important to establish the feasibility of continuing with this learning method in the future. The author believes that this research paper will make a meaningful contribution to the body of knowledge regarding the use of web 2.0 technologies for education.

## II. LITERATURE REVIEW

### Collaborative Learning

Collaborative learning is best described (Hilke, 1990) as “*an organizational structure in which a group of students pursue academic goals through collaborative efforts. Students work together in small groups, draw on each other’s strengths and assist each other in completing the task.*”

Collaborative learning has five basic elements (Gabbert *et al*, 1986):

1. Positive goal interdependence which occurs when learners undertake a group task believing that they cannot succeed unless everyone in the group succeeds.
2. Face-to-face promotive interaction which occurs when a verbal interchange takes place. With technology today this need not be face-to-face or verbal, but can be using electronic communication.
3. Individual accountability which means taking responsibility for learning material by giving individual tests, presentations, etc.
4. Social skills which involves knowing how to communicate effectively and how to develop respect and trust within a group.
5. Group processing to reflect on how well the group is working and to analyse the members’ effectiveness and how it may be improved.

Collaborative learning is also referred to as group work in education or small group learning, although not all group work can be called collaborative learning. There is a consensus among researchers, that collaboration involves the construction of meaning through interaction with others and can be characterised by a joint commitment to a shared goal (Häkkinen *et al*, 2003) Collaborative learning is often defined in a way that necessitates participants to be engaged in a co-ordinated effort to solve a problem or perform a task together (Littleton & Häkkinen,1999). This coordinated, synchronous activity is the result of a continued attempt to construct and maintain a shared conception of a problem (Roschelle & Teasley,1995).

### Social Computing

Social computing, also referred to as social informatics, can be defined as “...the interplay between persons’ social behaviours and their interactions with computing technologies (Roodt, 2010). Social computing involves both science and technology. As a domain of science, we seek to describe the relationships among social behaviours and machines so that we can reduce our uncertainty about how humans and machines will interact (Roodt, 2010). As a domain of technology, we seek to apply social and behavioural science to the design of information technology systems that enable efficient collaboration and support natural social behaviours.” (Dryer *et al*, 1999). Social computing is “...any type of computing application that serves as an intermediary or a focus for a social relation...” (Fun & Wagner, 2008). A layman’s understanding of this term would be that social behaviour, whether desired or otherwise, can be supported through information technology. When focussing on the latter, being the technology domain, then applications such as blogs, wikis and social networks could be used to support collaborative learning as these applications are a form of social software that encourages interaction and collaboration.

The author focuses on using social software in the form of certain Web 2.0 technologies in order to facilitate a participative educational process for collaborative learning (Roodt *et al*, 2009).

### The Net Generation

The Net Generation, also referred to as ‘The Millennials’ (Carlson *et al*, 2000), is the term used to describe people who were born between 1980 and 1994, coinciding with the introduction of the personal computer and the internet. These young adults exhibit a number of characteristics that make them unique, largely attributable to their fascination and familiarity with new technologies (Oblinger & Oblinger, 2005). One of these characteristics is described by Howe and Strauss (2000), who argue that these people, many of whom are now university students, mentally

process information differently because they were raised with the personal computer. Oblinger and Oblinger (2005:16) refer to this mental processing as "...the ability to process or piece information together from multiple sources." The other defining characteristics are (Oblinger & Oblinger, 2005):

- Ability to read visual images—they are intuitive visual communicators.
- Visual-spatial skills—perhaps because of their expertise with games they can integrate the virtual and physical.
- Inductive discovery—they learn better through discovery than by being told.
- Attentional deployment—they are able to shift their attention rapidly from one task to another, and may choose not to pay attention to things that don't interest them.
- Fast response time—they are able to respond quickly and expect rapid responses.

For the academic community, these students present a paramount challenge, not only because they learn differently from traditional learning methods but also because they want to learn differently (Roodt et al., 2009).

The Net Generation present a material challenge to the academic community, not only because they learn differently from traditional learning methods but also because they want to learn differently (Roodt et al., 2009). In terms of the defining characteristics mentioned above, there are ten features that have a potential impact on higher education (Oblinger & Oblinger, 2005):

- Digitally Literate – They can operate a variety of technological devices and are familiar with the internet, for example: laptops, cellphones and/or iPods ®.
- Connected – They are almost always connected to a technological network of some sort, for example: cellular networks and/or the internet.
- Immediate – They have fast response time and multi-task, for example: playing a game and instant messaging at the same time.
- Experiential – They have an exploratory style of learning and have a preference for 'learning by doing' which results in better memory retention of the subject matter, for example: creating an animation to teach peers about green IT instead of writing a document.
- Social - They seek to interact with others, whether in their personal lives, their online presence, or in class, for example: blogging and having social network profiles on a network such as Facebook ®.
- Teams – They prefer to learn and work in teams, for example: a peer-to-peer approach where students help each other.
- Structure – They like to know what it will take to achieve a goal, for example: rules, priorities and/or procedures for doing a task.
- Engagement and Experience – They like interactivity, for example: watching a YouTube ® video on a topic instead of reading slides.
- Visual and Kinesthetic – They are more comfortable in image-rich environments than text, for example: looking at pictures showing the impact of global warming instead of reading text.
- Things that Matter – They readily take part in community activities and want to learn about things that matter, for example: environmental concerns.

The consequences of this is that educators have to adapt not only their teaching methods, learning tools, content and assessment criteria, but also themselves in order to effectively help educate these students (Roodt et al., 2009).

## YouTube®

YouTube is a popular video sharing website where users can upload, view, and share video clips (Duffy, 2008). YouTube has become an enormously popular form of web 2.0 new media. A recent article in Wired cites an average of 65,000 uploads and 100 million videos viewed per day on YouTube (Godwin-Jones, 2007).

Video can be a powerful educational and motivational tool and a means toward achieving learning goals and objectives (Duffy, 2008). YouTube is increasingly being used by educators as a pedagogic resource, examples being from instructional videos to an online space to share student authored content (Duffy, 2008).

### III. COURSE OVERVIEW FOR THE YOUTUBE® INTEGRATION

The course is titled “Business Driven Technology” and is a mandatory subject for all first-year undergraduate students enrolling in the Faculty of Economic and Management Sciences at the author’s institution. The purpose of this course is to introduce students to computing and more specifically its application within a business context.

Part of the course included completing a group assignment which involved the following tasks:

- Creating a video on how businesses can use Web 2.0 technologies using YouTube® (collaborative **learning tool** in the form of multimedia technology)
- Creating a Facebook® group which all of their team members need to join, containing their student details (collaborative **learning tool** in the form of a Web 2 technology)
- Creating a Google website for the group onto which they needed to upload their YouTube® video to (collaborative **learning tool** in the form of a Web 2 technology)
- Linking 1, 2 and 3 above by placing a link to their Google® page on their Facebook® group profile.

The author required groups to have between 4 to 6 group members and they were **assessed** on the following **criteria**: Completeness, Creativity, Functional, Originality and Relevance. The assessment was conducted by the author and the author’s assistant lecturers. Planning has commenced to revise the assessment process for the following year in order to include some form of peer-to-peer review.

### IV. RESEARCH METHODOLOGY

#### Research Approach

This study was conducted in order to contribute to the body of knowledge relating on the use of the innovative learning tool, YouTube, for higher education. This was done by examining the experiences of 185 1<sup>st</sup> year undergraduate students with regards to the effectiveness of the teaching and learning approach.

Upon completion of the group assignment discussed in the above section, the students were asked to complete an on-line survey which assessed the effectiveness of the teaching and

learning approach with regards to green information technology. This paper focuses on assessing the use of YouTube as an innovative learning tool.

## Research Design

The author created a web-based questionnaire containing closed questions that was uploaded onto the institutions web-based course platform so that students could access the questionnaire both on-campus and off-campus. The questionnaire was setup to start at a certain time on a certain day and to end at a certain time on certain day and no maximum time limit was set for the completion thereof. Students were informed of this in class, on Facebook (through the course group) and on the course platform via a pop-up announcement. Students were incentivised to complete the questionnaire in the form of bonus marks.

They were given a possible range of answers in the form of a Lichter scale ranging from: Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree, Not answered; Yes, No, Not answered.

## Research Sample

The research sample was selected from 1st year undergraduate commerce students who are enrolled in a mandatory business driven technology course. The purpose of this course is to introduce students to computing and more specifically its application within a business context.

For the 2011 year, there were 1387 students enrolled for the course and 185 of them completed the questionnaire. The questionnaire contained a large number of questions of which sixteen related specifically to the use of the innovative learning tool, YouTube, for collaborative learning purposes which will be discussed below. The actual question numbers are included in brackets as well as the possible range of answers.

These questions were:

1. What gender are you? (1.1)
2. What is your age? (1.2)
3. From which ethnic group are you? (1.4)
4. I have learnt more in the group when using YouTube than I would have learnt on my own (5.5)  
[Always/Definitely; Frequently/Nearly Always; Occasionally/Seldom; Never]
5. I enjoyed working in a group using YouTube (5.6)  
[Always/Definitely; Frequently/Nearly Always; Occasionally/Seldom; Never]
6. The group motivated me to do my share of the work for the YouTube component (5.7)  
[Always/Definitely; Frequently/Nearly Always; Occasionally/Seldom; Never]
7. The group work relating to YouTube helped me to understand the course material better (5.8)  
[Always/Definitely; Frequently/Nearly Always; Occasionally/Seldom; Never]
8. I learned to co-operate with other people using YouTube (5.9)  
[Always/Definitely; Frequently/Nearly Always; Occasionally/Seldom; Never]
9. The YouTube group work caused me to be dependable and do my assignment (5.10)  
[Always/Definitely; Frequently/Nearly Always; Occasionally/Seldom; Never]
10. It was fun working in a group using YouTube (5.11)  
[Always/Definitely; Frequently/Nearly Always; Occasionally/Seldom; Never]
11. In the group I got the benefit of everyone's ideas when using YouTube (5.12)  
[Always/Definitely; Frequently/Nearly Always; Occasionally/Seldom; Never]
12. When I had problems I got help from group members via YouTube (5.13)  
[Always/Definitely; Frequently/Nearly Always; Occasionally/Seldom; Never]
13. The work got done faster and more work was done using YouTube (5.14)  
[Always/Definitely; Frequently/Nearly Always; Occasionally/Seldom; Never]

14. The YouTube group work gave me an opportunity to talk and discuss the course material (5.15)  
[Always/Definitely; Frequently/Nearly Always; Occasionally/Seldom; Never]
15. The YouTube group work made the course material more interesting (5.16)  
[Always/Definitely; Frequently/Nearly Always; Occasionally/Seldom; Never]
16. Do you think that learning to use YouTube as part of the INF112 was successful? (5.30)  
[Yes; No; Not answered]

#### IV. FINDINGS

This section details the questions and the results of the questions mentioned in the above section.

##### Question 1.1 Gender

	Response	Percentage
Male	76	41
Female	103	56
Not answered	6	3
<b>Total</b>	185	100

Table 1: Gender

As can be seen in Table 1 above, the majority of students are female (56%).

##### Question 1.2 Age

Age	Response	Percentage
17	2	1
18	50	27
19	73	39
20	34	18
21	11	6
23	5	3
24	1	1
25	0	0
26	1	1
27	1	1
28	0	0
29	0	0
30	0	0
Not answered	7	4
<b>Total</b>	185	100

Table 2: Age Distribution

The majority of students are between the ages of 18 to 20 which means that they can be considered as the Net Generation according to the definition discussed in the literature review.

### Question 1.3 Ethnicity

Race	Response	Percentage
Caucasian	56	30
Black	85	46
Indian	7	4
Asian	2	1
Other	25	14
Not answered	10	5
<i>Total</i>	185	100

Table 3: Ethnicity

The majority of the students are Black, with the second major ethnicity being Caucasian.

### Question 5.5 – 5.10 YouTube and Groupwork

#### Reponses

Question Number	5.5	5.6	5.7	5.8	5.9	5.10
	I have learnt more in the group when using YouTube than I would have learnt on my own	I enjoyed working in a group using YouTube	The group motivated me to do my share of the work for the YouTube component	The group work relating to YouTube helped me to understand the course	I learned to co-operate with other people using YouTube	The YouTube group work caused me to be dependable and do my assignment
1.Always / Definitely	53	61	48	33	48	53
2.Frequently / Nearly always	45	39	52	47	45	40
3.Occasionally / Seldom	26	24	22	40	32	26
4.Never	17	14	16	21	17	12
Not answered	44	47	47	44	43	54
Total	185	185	185	185	185	185

Table 4: YouTube and Group work (no of responses)



## Percentages

Question Number	5.5	5.6	5.7	5.8	5.9	5.10
	I have learnt more in the group when using YouTube than I would have learnt on my own	I enjoyed working in a group using YouTube	The group motivated me to do my share of the work for the YouTube component	The group work relating to YouTube helped me to understand the course material better	I learned to co-operate with other people using YouTube	The YouTube group work caused me to be dependable and do my assignment
1.Always / Definitely	29	33	26	18	26	29
2.Frequently / Nearly always	24	21	28	25	24	22
3.Occasionally / Seldom	14	13	12	22	17	14
4.Never	9	8	9	11	9	6
Not answered	24	25	25	24	23	29
Total	100	100	100	100	100	100

Table 5: YouTube and Group work (percentage based)

As can be seen in Table 5 above, in questions 5.5 – 5.10, the students were of the opinion that YouTube contributed positively to the group learning experience as is evidenced by the response percentages being mostly '1.Always/Definitely' and '2. Frequently/Nearly always'.

### Question 5.11 – 5.16 YouTube and Group work

#### Reponses

Question Number	5.11	5.12	5.13	5.14	5.15	5.16
	It was fun working in a group using YouTube	In the group I got the benefit of everyone's ideas when using	When I had problems I got help from group members via YouTube	The work got done faster and more work was done using	The YouTube group work gave me an opportunity to talk and discuss the course	The YouTube group work made the course material more interesting
1.Always / Definitely	68	51	32	32	36	51
2.Frequently / Nearly always	35	41	25	41	33	46
3.Occasionally / Seldom	18	26	16	37	34	19
4.Never	9	14	59	20	25	18
Not answered	55	53	53	55	57	51
Total	185	185	185	185	185	185

Table 6: YouTube and Groupwork cont'd (no of responses)

**Percentages**

Question Number	5.11	5.12	5.13	5.14	5.15	5.16
	It was fun working in a group using YouTube	In the group I got the benefit of everyone's ideas when using YouTube	When I had problems I got help from group members via YouTube	The work got done faster and more work was done using YouTube	The YouTube group work gave me an opportunity to talk and discuss the course material	The YouTube group work made the course material more interesting
1.Always / Definitely	37	28	17	17	19	28
2.Frequently / Nearly always	19	22	14	22	18	25
3.Occasionally / Seldom	10	14	9	20	18	10
4.Never	5	8	32	11	14	10
Not answered	30	29	29	30	31	28
Total	100	100	100	100	100	100

Table 7: YouTube and Group work cont'd (percentage based)

As can be seen in Table 7 above, for questions 5.11 – 5.16, the students were of the opinion that YouTube contributed positively to the group learning experience as is evidenced by the response percentages being mostly '1.Always/Definitely' and '2. Frequently/Nearly always'. It is also interesting to note how high the degree of enjoyment was that the students encountered when using YouTube in a group setting (37% said it was always fun). Additionally, the majority of

students (28% & 25%) feel that the YouTube group work made the course material more interesting.

**Question 5.30 Success of using YouTube**

**Responses**

Question Number		5.30
		Do you think that learning to use YouTube as part of the INF112 was
1.Alw ays / Definitely		
2.Frequently / Nearly alw ays		
3.Occasionally / Seldom		
4.Never		
Not answered		
Total		
1.Yes		120
2.No		18
Not answered		47
<i>Total</i>		<i>185</i>

Table 8: Success of using YouTube for INF 112 (no of responses)

## Percentages

Question Number	5.30
	Do you think that learning to use YouTube as part of the INF112 was successful?
1.Alw ays / Definitely	
2.Frequently / Nearly alw ays	
3.Occasionally / Seldom	
4.Never	
Not answered	
Total	
1.Yes	65
2.No	10
Not answered	25
<i>Total</i>	<i>100</i>

Table 9: Success of using YouTube for INF 112 (percentage based)

As can be seen in Table 9 above, the vast majority of students (65%) felt that learning to use YouTube as part of the course was successful.

## V. CONCLUSION

The implementation of YouTube has had a remarkable positive impact on the students since an overwhelming majority of students perceived the use of YouTube as an innovative learning technology as a major enhancement in improving their general computer knowledge. It can be assumed that the students accept the technology as part of the educational process and experience the use of YouTube as significant achievement of IS competence.

Further research is being conducted by the authors to assess the effectiveness of each of the teaching methods and learning tools both individually, collectively and then holistically. This will provide insight into the effectiveness of utilising social computing in the form of social software within the higher education context. It will also provide insight into the learning preferences of the Net Generation which will have an important influence on the strategic direction of the institutions teaching and learning approaches.

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## ABOUT THE AUTHORS

Sumarie Roodt completed her BCom: Informatics at the University of Pretoria before working in financial services for 6 years. During her time in the banking sector she performed a number of roles, including being a project manager, a strategic alliances portfolio manager and then a strategy consultant. Sumarie decided to pursue her MBA full-time at the University of Cape Town's Graduate School of Business and was then selected to attend the University of Chicago's Graduate School of Business for a semester. Sumarie is now a full-time lecturer at the University of Pretoria and is currently busy with her PhD in Informatics. Her specialty is social software for education.

Carina de Villiers is currently full professor and since 2000 Head of the Department of Informatics at the University of Pretoria (UP), South Africa. She obtained a BSc(Computer Science and Mathematics), Higher Education Diploma, Diploma in Tertiary Education, MEd (Didactics) *cum laude*, Honours degree in Computer Science and a PhD(Informatics) degree. She started her career in 1979 as a junior lecturer at the University of South Africa (distance learning) and joined the University of Pretoria as an associate professor in 1996. She also served as Chairperson of the School of Information Technology, consisting of three departments, from 2002 to 2005.