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ORIGINAL RESEARCH ARTICLE

Using connectivism theory and technology for knowledge creation in cross-cultural communication

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This study examined the significance of connectivism theory and technology for knowledge creation in cross-cultural communication. The findings rely on the exercise designed and conducted by the facilitators of two different institutions/universities based in two different countries. This exercise was conducted for two intercultural management classes in New Delhi, India and Graz, Austria. This article used student-centric teaching approach and output-oriented methodology based on the principles of connectivism and knowledge creation. It demonstrates how these approaches foster lifelong learning in students. The task involved selection of commercial advertisements (preferably national ones), in which students were expected to work in virtual teams and find cultural differences in the interpretation between the participants from two countries: India and Austria.

The key findings of this article are the following:

- The students learnt that an answer to a specific question might match the expectations at one point of time with one specific group of people, but might be different in some other point or with some other group of people.
- They examined the role of connectivism and its potential application in knowledge creation.
- They learnt that people generally see the world not as it is, but as they are, or, as they are conditioned to see it.

Keywords: connectivism; technology; knowledge creation; collaboration; cross culture

Introduction

With the advent of technology, learning theories are changing rapidly. The latest developments and presence of the Web in our day-to-day life have changed the fundamental of teaching learning process. Drastic change is visible in learning processes; it can now happen online outside the control of the institution. The three broad learning theories, that is, behaviourism, cognitivism and constructivism, will be losing their significance if the technology aspect is not imbibed with them (Perrin *et al*. 2005). All the stated theories considered learning as a socially enacted process that is related with individual brain. They did not consider learning as a process that can happen from outside.

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The pace at which the knowledge measurement criteria are changing due to technology advancement, the life of knowledge is measured in months and years. According to the American Society for Training and Documentation (ASTD), the amount of knowledge in the world has doubled in the past 10 years and is doubling every 18 months (Richardson 2015). To combat the shrinking half-life of knowledge, organisations have been forced to develop new methods of deploying instruction (Gonzalez 2004). Researcher Vaill in his observation said that 'learning must be a way of an ongoing set of attitudes and actions by individuals and groups that they employ to try to keep abreast of the surprising, novel, messy, obtrusive, recurring events…' and therefore it is important for the instructors to look for innovative tools of teaching and learning (Vaill 1996).

New fields of teaching and learning are emerging at a fast pace. Tools of learning define and shape our way of thinking. Learning has become a lifelong and continuous process that follows after formal education in schools and colleges. While lecturing is still the prevalent teaching style in many universities, there is a serious need to change the educational landscape by introducing innovative teaching learning methodologies. Different views of learning give birth to different perspectives on knowledge development.

Learners in today's time are no more passive consumers of information. Rather, they participate in producing information. Learning through social media has become one of the very popular and successful methodologies among students. They feel that these methodologies are not only self-motivating but also informal in nature, and informal ways of learning are more appreciated by the young learners (Bell *et al*. 2009; Dabbagh and Kitsantas 2011; Ebner *et al.* 2009; Krashen 1976). In such circumstances, self-regulated learning and personal learning environments (PLEs) can be a source to integrate formal and informal learning and foster self-regulated learning in higher education contexts (Dabbagh and Kitsantas 2012). Self-regulated learning involves the students' ability to engage proactively and work independently in an atmosphere that is self-motivating and encourages behavioural processes that increase the attainment of goal (Zimmerman 2000). Dabbagh and Reo (2011a) developed a pedagogical framework for using social media in education based on the levels of interactivity these tools enable. These levels are (1) personal information management, (2) social interaction and collaboration and (3) information aggregation and management (Dabbagh and Reo 2011a). Based on the past researches, there are strong evidences to prove that social media can help in creating PLEs that help learners work together with people in different contexts, integrate and share the results of learning achievements, collaborate in collective knowledge generation and manage their own meaning making (Dabbagh and Kitsantas 2012). A study conducted in 2010 by EDUCAUSE Center for Applied Research (ECAR) revealed that students' use of social media has steadily increased from 2007 to 2010 and the gap between older and younger student use of social media is shrinking (Smith and Caruso 2010). Social media intervention has been successful in developing strong feeling of social connectedness and favourable learning experiences in the classes (Pan, Scollon, and Scollon 2002). Research has also revealed an increase in students' familiarity with using social media and student research skills (Blaschke 2014). A growing enthusiasm within the higher education sector for technology-enhanced learning has increased in recent past (Buchanan, Joban, and Porter 2014). Students have shown considerable interest in more participatory and interactive technologies, such as wikis, blogs and social media, than in traditional content delivery tools.

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In view of the discussion, the term 'sociotechnical context' has gained momentum. It is in high demands for those trying to explore the opportunities presented by emerging technologies. Teachers, learners, managers and policymakers all over the world are trying to integrate learning, both formal and informal, with technology. Researchers and teachers look for the theories that can disseminate these actions in a useful manner. With the development of andragogy and experiential learning (Rogers 2002) and with the advent and proliferation of information and communication technologies (ICTs), its swelling presence in our day-to-day life and vanishing boundaries of settings where learning happens, perspectives such as connectivism have emerged. According to George Siemens, the theory of connectivism can fit well in the digital age. This theory can be a successor to behaviourism, cognitivism and constructivism theories (Siemens 2004).

Recent studies have shown a high expectation from Business Management graduates to perform with cultural sensitivity in international and intercultural professional environments, and studies have been conducted to assess how a variety of assignments and activities in the classroom can support the development of the required mindset (Frank 2017). The present study examined the significance of connectivism and technology for knowledge creation. It is based on an exercise designed, keeping connectivism theory in mind, by the facilitators of two different institutions/universities based in two different countries. This student-centric exercise was conducted for two intercultural management classes in New Delhi, India and Graz, Austria. The study discusses how creating a PLE with the help of technology can serve as a platform for integrating formal and informal learning. The exercise was output oriented, which fostered self-regulated learning by the students. The learners compiled and shared the results of their learning achievements. They participated in collective knowledge generation and managed to generate their own meaning.

Connectivism

Unlike past theories, connectivism is an idea that believes learning can happen from outside. The foundation of this theory is based on an understanding that any decision taken at one point of time may change due to rapidly altering foundations. New information is continuously being generated and acquired. The most important element in this theory is to develop an ability to differentiate between important and unimportant information. The ability to recognise an information that gets altered due to a change in the landscape is also critical (Siemens 2005). *Half an Hour Blog Posts* defines connectivism as, 'At its heart, connectivism is the thesis that knowledge is distributed across a network of connections, and therefore that learning consists of the ability to construct and traverse those networks'[1]. According to Downes, the concept of connectivism, as it has been used when applying ideas from biological models of the brain to neural networks in machine learning, treating the neural network as part of a whole:

> The overall view that a strongly interconnected neural network and its firing patterns must be considered as part of a whole became an important principle of orientation in the study of the nervous system; it is referred to under the name of connectivism. (Geszti 1990, p. 2)

Connectivism contributes to the development of new pedagogies where control is shifting from the teacher to learners (Kop and Hill 2008), reminiscent of the

constructivist shift identified by networked learning (Goodyear 2001). Connectivism aspires to redefine learning within the diverse contexts identified in the Introduction and to deliver a learning theory for the digital age (Bell 2011). It is one of the most prominent of the network learning theories that have been developed for e-learning environments. It is beginning to be recognised even by medical educators (Goldie 2016). The popularity of this pedagogical method has emerged in the form of massive open online courses (MOOCS). Siemens and Downes ran the first programme on 'Connectivism and Connected Knowledge' in 2008, attracting over 2000 participants worldwide. Educators either acted as facilitators or were totally absent from the learning process (Downes 2006; Siemens 2008b).

In 2005, Stephen Downes of National Research Council, Institute for Information Technology, in Moncton, New Brunswick, Canada, in his study characterised connective knowledge as interactive knowledge *of* a connection within a network (Downes 2005). George Siemens considered connectivism as a learning theory for the digital age, a successor to behaviourism, cognitivism and constructivism (Siemens 2004). It involves flow of knowledge between humans and non-humans, a network comprising connections between entities which he termed as 'nodes'. These nodes are individuals, groups, ideas, resources and communities. Siemens (2005) analysed significant trends in learning, which should be considered in a modern teaching environment: (1) the variety of fields in which learned knowledge will be applied is growing. (2) Informal learning is of growing importance. (3) Learning is a lifelong process. (4) The organisation and the individual are both learning organisms. (5) Technology can support many learning processes. (6) Know-where, the understanding of where to find knowledge is essential. Classroom teaching and the conservative one-way lecturing will make it difficult to match the changing trends.

Learning theories in the digital age are more student centric and output oriented. They focus on developing competencies and skills than building knowledge that has no scope of applicability. As the competencies acquired in classrooms are vividly used by students in their workplaces, it becomes increasingly significant for the instructors to use different learning paths. Some broad teaching approaches encompass replacing lectures with active learning, integrating self-paced learning programmes and/or cooperative group situations, ultimately holding students responsible for their own advances in education, allowing them to shape their own learning experience. The educator's role is increasingly changing from that of a teacher to a moderator or coach.

Karen Stepheson stated that 'Experience has long been considered the best teacher of knowledge. Since we cannot experience everything, other people's experiences, and hence other people, become the surrogate for knowledge' (Kleiner 2002). In this scenario, connection plays a significant role in generating a source of knowledge. This alternative theory of learning is evolving on some unique ideas like chaos. This is a new reality for knowledge workers. Calder defined chaos as 'a cryptic form of order' (Calder 2004). Unlike constructivism, which states that learners attempt to foster understanding by meaning-making tasks, chaos states that the meaning exists – the learning happens when the learner recognises the patterns that appear to be hidden. Meaning-making and forming connections are the two important activities involved in this process. It relies more on our action that is based on what we already learnt. It is the skill to recognise and then to adjust to pattern shifts in the new environment. The decision taken itself might change as it may no longer appear to be as correctly defined as it was at the time it was made. This ability to recognise and adjust to the

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pattern is a key learning task (Siemens 2005). Based on the argument stated above, it can be concluded that connectivism is an amalgamation of chaos, connectivity, complexity and self-organisation theory. Kop and Hill (2008) has provided the best definition so far:

> …learning organization whereby there is not a body of knowledge to be transferred from educator to learner and where learning does not take place in a single environment; instead, knowledge is distributed across the Web, and people's engagement with it constitutes learning. (p. 2)

It is derived by the understanding that decisions are based on the rapidly changing foundations. New information is continuously pouring in huge amount and the challenge is to draw a distinction between important and unimportant information.

Drawing from the work of Driscoll (Siemens 2008b), learning can be categorised into three broad epistemological frameworks: objectivism, pragmatism and interpretivism. Objectivism emphasises that reality is external to mind and knowledge is acquired experientially, while pragmatism suggests that knowledge is a negotiation between inquiry and action. Interpretivism considers knowledge as an internal construction and is informed through socialisation and cultural cues. A fourth framework was introduced by Downes (2006) and supported by Siemens (2008a, 2008b). It says '… the view of knowledge as composed of connections and networked entities …The concept of emergent, connected, and adaptive knowledge provides the epistemological framework for connectivism as a learning theory' (p. 10). Combining the two, the alignment between epistemologies and learning theories is detailed in Figure 1.

The connectivist principles highlighted by Siemens are well-aligned with and were found to be compatible with Web 3.0 technologies (Foroughi 2015; Hussain 2013).

The use of Internet is no more confined to laboratory. It is now omnipresent, in the classroom, home, college campus and in our day-to-day activities. Its inevitable significance in our life has challenged us to learn the skills on how to work effectively in the dynamic environment. This medium is a rich source of information that enables individuals and groups to not only share and publish but also monitor sources that may be of interest to them rather than just a simple search. The resources include, but not confined to, genres of media tools such as blogs and wikis that are freely available online.

With the changing time, learning on demand is becoming a type of lifestyle in modern society (McLoughlin and Lee 2007). Learners constantly seek information to address a problem at work, school, or to just satisfy a curiosity. To do so, they take advantage of digital and networked technologies not only to seek information but

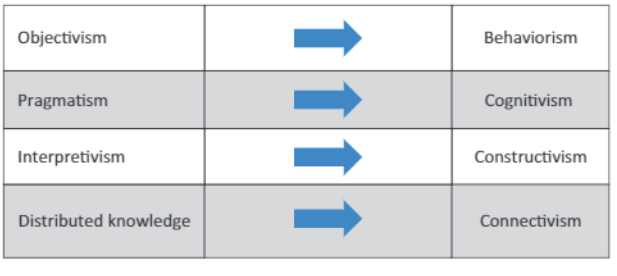

Figure 1. Alignment of epistemologies with learning theories.

also to share information. Thus, learners should not be considered as passive information consumers; rather, they are active co-producers of content. In addition, learning in the context of social media has become highly self-motivated, autonomous and informal, as well as an integral part of the college experience.

Social media in the 21st century embeds the social facets of the Internet like communication, collaboration and creative expression. It is often interchangeable with the terms 'Web 2.0' and 'social software' (Dabbagh and Reo 2011b). The theory of connectivism uses media as the most essential and powerful tool of learning. It makes instructors experimenter; it breaks the barrier of restricting students to learning formats by giving them liberty to form their own formats of learning. It does not restrict learning activities to the classrooms and encourages students to make effective use of technology rather than considering it as destructive.

The connectivist approach is convenient as it allows learners to use resources that are open and freely available on the Internet. These sources have creative common licences, which allow learners to use and share them legally. Bell in his article published in 2009 suggests six steps for the educators who wish to use connectivism as a pedagogy:

1. Follow the blogs of those who innovate with educational technologies.
2. Experiment (within your comfort zone) with Web services and tools that might enrich teaching and learning in your practice.
3. Use, publish and share resources through blogs, wikis, and photo- and video-sharing sites.
4. Encourage students to use the Web for scholarly resources – being critical and selective and attributing sources.
5. Assign student activities that enable effective use of media to report process and, where appropriate, outcomes.
6. Make explicit the concept of connectivism in student support activities so that they can exploit it in their own independent learning (Bell 2009).

Methodology

The research methodology followed in this article used eight core principles given by Siemens to design the learning activity (see Table 1).

Building exercise

Based on the principles given by Siemens, the implications were extracted to build an exercise that will incorporate four important elements. Those elements are highlighted on the right column of Table 1 and can be briefed as follows: (1) provide multiple nodes or connection points for students, (2) support the interactive acquisition and exchange of knowledge, (3) involve current topics and clearly indicate pathways for deepening that knowledge in the future and (4) allow students to make their own decisions and choose their own learning path.

Developing intercultural competencies among students is a central part of learning about intercultural communication and management. In a bachelor's course on intercultural management, different methodologies of how to assess and interpret cultural differences were discussed in the class. To support this more or

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Table 1. Connectivist principles and teaching implications.

No.	Connectivist principle	Designing a learning model
1	Learning and knowledge rest in diversity of opinions.	Activity that facilitates various connection points (nodes) for students to enable them explore the topic from different angles. Freedom to accept more than one solution to a problem (providing nodes). The exercise should use multiple sources of information. There should not be any restriction on the medium of information gathering. These information sources can be people, journals, books, articles, databases, social networks, etc. The exercise should focus on output orientation and not only knowledge creation. The topic selected should be relevant to the present need. It should aim at developing competences that can be applied to problems. It should clarify how an in-depth understanding can be further developed. Focus should be on the application of knowledge (output orientation as opposed to pure knowledge acquisition). Exploring, understanding and decision-making by students themselves about their own learning pathways. Understanding that the knowledge gained is dynamic and can change due to changes in the information climate. The teacher is taking the role of a moderator (student centred).
2	Learning is a process of connecting specialised nodes or information sources.	
3	Learning may reside in non-human appliances.	
4	The capacity to know more is more critical than what is currently known.	
5	The ability to see connections between fields, ideas and concepts is a core skill.	
6	Nurturing and maintaining connections are needed to facilitate continual learning.	
7	Currency (accurate, up-to-date knowledge) is the intent of all connectivist learning.	
8	Decision-making is a learning process. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality. While there is a right answer now, it may be wrong tomorrow due to alterations in the information climate affecting the decision.	

less traditional teaching approach, based on lectures and audio-visual resources, an exercise was developed. Persuasive digital technologies were used to enable intercultural competencies among students across two different courtiers in teams, which helped them find ways to work harmoniously with people having different cultural backgrounds.

Going through the fact that the competences acquired in a classroom will be applied differently by different students in the course of their future careers, it was logical to use more than one learning path and accept the fact that more than one result might be correct. Such exercises allow students to shape their own learning experience (Samuel 2012). The present study aimed to analyse how an exercise, which might only constitute one of many teaching methods in a course, could be set up to generate a learning experience that may go a long way in the career path of the students.

Sample

The exercise was designed by two professors, one from Birla Institute of Management Technology (India) and the other from FH Joanneum (Austria), for teaching cross-cultural communication to 120 postgraduate students (60 from each country) in 2015–2016.

Associative group analysis (AGA) framework (an inferential approach to analyse people's mental representations) was adopted but not used as a survey instrument. Unlike AGA that uses language, specifically 'words', to understand differences in psychological meaning across cultures, the present study used full commercials/advertisements as units of analysis.

First step

Eleven teams comprising 5–6 students each were formed on both sides. One coordinator from each side for each group was nominated and email ids were shared. Students in each team selected an advertisement (preferably national ones) of their choice, in which they were expected to find cultural differences in the interpretation between India and Austria. Selected advertisements were easily found on YouTube and can be used as teaching and learning material. They had the task to discuss presented ads and to find and state differences in perceptions. The students used diverse channels (e.g. different social media), which were suggested or chosen by the participants themselves. The resulting media galleria and connected discussion topics included, in total, more than 600 ads, leading to a broad learning experience. No single facilitator can come up with such a broad information base and it can be safely assumed that no student used all of these available resources, instead they selected the learning path most suitable to them only. The following questions were used for the analysis:

1. How does your group understand the advertisement and how does it work for you?
2. How do you think will the other side understand the same advertisements, will there be any difference to your own understanding?

Second step

The students had to analyse these advertisements according to cultural standards or dimensions (using one or more of the theories presented in the course). To verify their analysis, they contacted students from the partner institute and asked them for their understanding of these advertisements by posing concrete questions. The students were instructed to ask for short feedback (only a few questions, which could be answered by both the teams within the given time). In turn, they were expected to answer the questions from the students on the other side.

The resulting reflection was recorded in writing. In a second step, the students were asked to send the ads and a number of self-developed questions to their colleagues in counterparts. These questions had the aim to learn about the reactions and interpretations of the other side. The resulting answers were compared with their own predictions and discussed in a short paper. In total, more than 120 students participated in 2015 and 2016 in Austria and India.

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Table 2. Application of connectivist principles in the learning model developed (Siemens 2004).

No.	Recommendation	Realisation
1	Activity that facilitates various connection points (nodes) for students to enable them explore the topic from different angles. Freedom to accept more than one solution to a problem (providing nodes).	As the students were required to form their own opinion on which elements could be seen differently in the relevant cultures, they need to do research. They connect with people, who provide their own opinions and viewpoints. They learn about how to verify their theories and how to ask the right questions.
2	The exercise should use multiple sources of information. There should not be any restriction on the medium of information gathering. These information sources can be people, journals, books, articles, databases, social networks, etc.	Students were free to use any existing source for information, such as electronic sources like blogs, articles, journals or social media. There were unlimited amount of possible paths and no assigned best possible path.
3	The exercise should focus on output orientation and not only knowledge creation. The topic selected should be relevant to the present need. It should aim at developing competences that can be applied to problems. It should clarify how an in-depth understanding can be further developed. Focus should be on the application of knowledge (output orientation as opposed to pure knowledge acquisition).	The students learnt by applying the theories to real-world situations. They understood how these theories interact with reality and how they can be further developed. By providing an analysis of the viewpoints, they connected the provided nodes with their existing knowledge.
4	Exploring, understanding and decision-making by students themselves about their own learning pathways. Understanding that the knowledge gained is dynamic and can change due to changes in the information climate. The teacher is taking the role of a moderator (student centred).	The students made their own choices about nearly every element of the learning process, including the selection of their main topic (by choosing the ad) and by designing the interaction (by asking concrete questions to their colleagues).

During the process, students explored whether there were 'gaps' between students' perceptions of cultural understanding and the reality which they in fact received in the post-observation. The research was guided by a conceptual framework based on principles of theory of connectivism. Qualitative approach and content analysis were adopted to analyse the data.

Findings

The resulting content was large and diverse. Through the answers from students of different cultures and fields of study many differences in perceptions of these ads became obvious. Themes were extracted and gaps were identified between perception and reality. Valuable insights came up from both cultures' mindsets regarding

the context being investigated. Each identified gap left students with extra knowledge and information about each other's culture. Findings from some examples are elaborated here.

Themes and gaps identified

(1) **Violence against women (Dolce and Gabbana print ad[2])**
Though the groups on both sides acknowledged that people will react strongly, the Indian students felt and informed that the reaction in Indian rural settings might not be that intense. This is because women living in rural settings in India are still vulnerable and can easily be overpowered. The sad part is that they are not even aware that they are being exploited.

(2) **Cruelty against animals and religious association- (Adidas' cow heart ad by Lukas Podolski[3])**
Teams on both sides disapproved the idea of holding a cow's heart by the football players to show the toil they put in winning the match, but Austrian students felt that Indians will disapprove because of the religious sentiments associated with the animal 'cow'. However, the Indian students disapproved this opinion outrightly. They stated that the advertisement is offensive not because of the showcasing of cow's heart but because it depicts cruelty towards animals in general and bloodshed.

(3) **Views on smoking (Creative anti-smoking ad by Bored Panda website)**
Indian students stated that the ad investigated will create a powerful impact on the smokers in Austria. Unlike their view, for Austrians it will be just another campaign against smoking. Based on the responses, the Indian students learnt that most of the smokers in Austria are quite stubborn and may feel offended by this ad. Almost 30% of the 12–18-year-old teenagers smoke regularly; it is just a casual thing, a part of their living style.

(4) **Political boundaries and friendship (Google Search reunion[4])**
Teams on both the sides found this commercial beautiful and heart-warming. Both sides felt that they were able to connect with the commercial and found that it was really smart of Google to use this plot to promote their search engine. The Indian students stated that Austrians might relate to the feeling of meeting one's best friend after ages but will not understand the political, emotional and social significance of making the two friends, one from Pakistan and the other from India, meet after partition. Unlike their view, Austrian students stated that with the similar historical background (partition) they can feel the connect.

(5) **Views on marriage (Platinum day of love ad[5])**
Since there is a lot of cultural difference with regard to marriages, Indian students thought that Austrians will not understand the concept of falling in love after marriage. This was found to be true. Austrians found it very strange. They did not relate with the emotions. They stereotyped arranged marriage in India and also found it unusual to fall in love after marriage.

(6) **Valuing private space (Incredible India: Indian Tourism[6])**
This commercial depicted eve-teasing with foreign tourists. In India such incidents generally go unnoticed unless the situation escalates too high. People do not hesitate to break the private space and push themselves upon others. It is normal among common crowd, especially with tourists.

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However, Austrians consider it rude to disturb strangers on the streets. They value private space and do not appreciate intervention. The Indian students learnt that there are laws against the common people also if they are present in such situations and do not offer help to the victim.

(7) **Gender discrimination in household (Ariel's 'Share the Load'[7])** Indian students felt that Austrians will find it abnormal that almost all household works are done by females at home. This is because they felt that in western countries gender discrimination does not exist when it comes to division of labour in a household. But they learnt that the traditional Indian families and the conservative Austrian families think on similar lines. However, in India, even in urban families, the majority of the work is done by the women and not shared equally by the menfolk.

(8) **Beauty standards (Olay's Flawless is overrated[8])**
This commercial showed Olay with overweight female models – in India, beauty is judged by the physical appearance and size zero body figure. However, Austrian being an advanced country with modern thinking, the Austrians might judge the beauty through various other parameters. It was found that as in India, beauty is also judged majorly by physical appearance in Austria. Like India, even Austria is in a gradual change mode with respect to standards of beauty.

(9) **Patriarchal society (*Nayi soch* [New thinking][9])**
Nayi soch (New thinking) was an ad by cricketers, about which the Indian students perceived that Austrians will not understand the concept of displaying a mother's name on the T-shirt for the simple reason that they do not have a patriarchal society. Yes, they were right, but in the process of getting their opinion on this theme, they explored that no such discrimination existed in Austria, and the issue with women empowerment is mainly discussed in connection to the salary.

(10) **Understanding Indian festival (Amazon's Raksha Bandhan ad[10])**
Indian students were sure that Austrians will not understand the emotional appeal shown in the ad between siblings as they do not celebrate any such a day. Yes, they did not understand for the same reason, but after trying to understand the concept of Raksha Bandhan they felt that the ad was very beautiful. The process made Austrians enhance their knowledge related to the custom in India that makes people celebrate sibling bonding.

(11) **Interpretation of the popular word** jugaad **(Sulekha ad[11])**
In India, the term *jugaad* is quite commonly used for people who manage to do things with the limited resources around them. There is a negative connotation implied with this term, as we perceive that the solution provided is temporary. Though the term *jugaad* was understood correctly, the meaning perceived by Austrian students carried more positive connotation. According to them, *jugaad* means 'the act through which somebody fixes problems very creatively and with less money and resources'.

Participants' opinions on using connectivist environment for generation of knowledge in cross-cultural studies

Connectivism theory is an autonomous way of learning where the learners were self-directed. Group was independent to choose a medium, aggregate, create, relate and share the information outside the classroom. They were responsible to set learning

goals, manage time, identify resources, try out new media tools and make them work. There were mixed reactions from the learners. One participant commented:

> This was my first activity. Earlier it used to be in a formal classroom and the instructor was equally responsible for the successful completion of the learning activity. Initially, my group found it problematic. But slowly the things became interesting.

Another group commented 'Despite being highly socially sensitive, open to collaborate, share views, our group on the other side was not responding. We feel collaborative and autonomous learning may not necessarily mean result in knowledge creation'. Many groups shared positive feedbacks. One group stated that 'It was a thought-provoking project for us. Learning about Austrian culture was made so interesting. We discovered many eye-opening facts that we might remember throughout our lives'.

> Through this productive interaction with our Austrian counterparts, we as a group discovered a whole new angle to the cross-cultural exercise. We acquired knowledge and distinguish between facts and fiction through interesting interactions with one another, rather than from a teacher.

There were mixed reactions. On the one hand, some groups found the exercise to be highly productive while directing their own learning, on the other hand some groups preferred more support and coordination from the instructor in the form of some assignments that can give their learning a direction.

In the end of the project, students were asked to reflect on the skills developed and competencies enhanced during the process (see Figure 2).

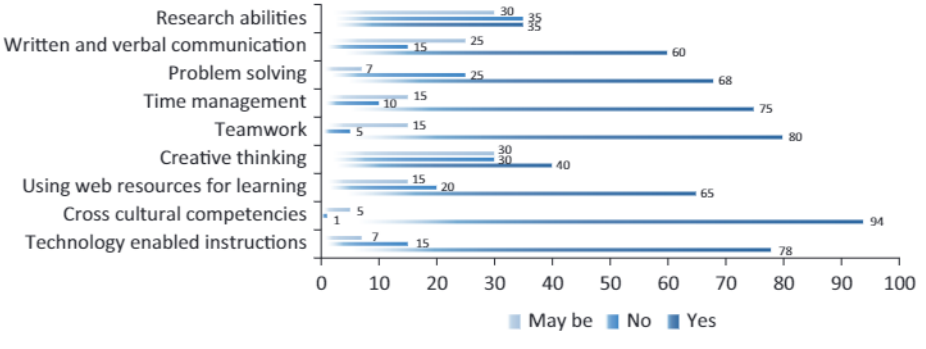

Figure 2. Skills Developed during the Process.

The activity was designed to develop cultural competency in the intercultural business management class and the scores came out to be highly satisfactory on this parameter. The skills related to organising and managing learning for using Web resource and technology-enabled instruction were rated between good and very good. Scores were relatively low on the critical thinking and research abilities. In the personal conversation, many groups blamed time as a constraint. It was interesting to see that the scores were very good for team work, time management and problem-solving. The abilities in verbal and written communication also scored averaged to good.

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Conclusion

This study proved the fact that by using simple methods and rules it is possible to introduce connectivist principles successfully in the teaching process. This can be done without completely overthrowing the existing learning paradigm.

By applying four simple principles – (1) providing nodes, (2) building connections, (3) output orientation and (4) student-centred learning – the connectivist learning paradigm can actively be used to provide a different, perhaps enhanced, learning experience to students.

By analysing the different levels of perceptions involved the students learnt that an answer to a specific question might match the expectations at one point of time and for a specific group of people, but it can be different in a different time zone and with different people. The students designed their activities consulting their group members. This enabled self-learning atmosphere. They learnt to identify the similarities and differences between their understanding and expectations with that of the reaction of the group on the other side at personal level.

The students reached these defined learning outcomes through different routes and have, in the process, probably learnt very different things, many of which are not obvious to the teachers. They followed their own learning pathways and unique networks. It was felt by the instructors that the current student population, being digital natives and often (if not always) being connected to their digital community, excelled in using the provided nodes for their own learning success and were quick to enlarge their own networks.

Students felt that they spent less time on gathering and integrating knowledge and more time on higher level thinking – gathering information from human and non-human sources, synthesising information, constructing new knowledge and applying what they learnt (Ohler 2008). They learnt to acquire knowledge and distinguish between facts and fiction through interactions with one another, rather than from a teacher (Bell 2011).

The assessment of such exercises can only be done by assessing the quality of the produced output (e.g. the quality of the short papers produced in the above course), not by checking rote learning. It was felt that elements taught in class by lecturing and audiovisual material were also connected to the connectivist learning experience as nodes, which anchors them more firmly in the students' knowledge base. Otherwise they would probably have been forgotten fast. In this student-based activity, the students designed most of their own learning experience, which enabled them to perceive the similarities and differences between their views, their expectations and the reaction of the other side on a very personal level. Some comments from students include the following:

> It was a thought-provoking project for us. Learning about Austrian culture was made so interesting. We discovered many eye-opening facts that we may remember throughout our lives.

> Through this productive interaction with our Austrian counterparts, we as a group discovered a whole new angle to the cross-cultural exercise. We acquired knowledge and distinguish between facts and fiction through interesting interactions with one another, rather than from a teacher.

They learnt as stated by Stephen Covey, 'we see the world, not as it is, but as we are or, as we are conditioned to see it' (Covey 1989). Hence, the methodology proved to be a good source of not only knowledge creation but also output orientation.

While connectivism proves to be a useful method through which teaching and learning using digital technologies can be better understood and managed, further development and testing is required. A single theory may not be sufficient to explain learning in technology-enabled networks. Educators will still have an important role to play in an online network learning while designing, monitoring and evaluating the exercise.

Research implications

The principles demonstrated in this article can be used to study a variety of fields to explore very different concepts. These principles are not restricted to 'soft' topics. One of the instructors used the same principles successfully to teach the application of statistical methods. With certain adaptions connectivism theory can prove to be highly beneficial. Nodes and connections can be different for different subjects, but very often the Internet, social media and existing groups and networks provide a rich source of nodes to connect to.

Notes

1. https://halfanhour.blogspot.in/2007/02/what-connectivism-is.html
2. https://www.google.co.in/search?q=dolce+and+gabbana+ad+overpowering+womens&rlz=1C1CHBD_enIN751IN751&source=lnms&tbm=isch&sa=X&ved=0ahUKEwik7OLtwaXXAhWEnZQKHfyDC2AQ_AUICigB&biw=1135&bih=457&dpr=1.13#imgdii=oWvdFaRmp1F-SM:&imgrc=m21Un1QPhz8dwM:
3. https://www.google.co.in/search?rlz=1C1CHBD_enIN751IN751&biw=1135&bih=457&tbm=isch&sa=1&ei=SgL-Wa2fF8a40ATPsZugCg&q=football+player+holding+a+cow%27s+heart&oq=football+player+holding+a+cow%27s+heart&gs_l=psy-ab.3...7657.429913.0.430811.78.46.0.0.0.0.765.8029.2-21j3j1j1j1.27.0....0...1.1.64.psy-ab..53.16.4696...0j0i67k1.0.60tzCN_cmWY#imgrc=W9BlD4kazxZ50M:
4. https://www.youtube.com/watch?v=gHGDN9-oFJE
5. https://www.youtube.com/watch?v=07Rz_zYJZ_E
6. https://www.youtube.com/watch?v=Ee5Bq_eBlYM
7. https://www.youtube.com/watch?v=wJukf4ifuKs
8. https://www.youtube.com/watch?v=u1whG-9BjsQ&t=5s
9. https://www.youtube.com/watch?v=FxE3o8crEes
10. https://www.youtube.com/watch?v=hhhEMpgDUGQ
11. https://www.youtube.com/watch?v=loumMCQ_eLE

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