A pedagogical perspective on online teaching

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In this paper the authors discuss if and how pedagogical principles, originally developed for on-campus courses, can be equally applicable to online courses. The authors present and argue for six pedagogical principles that guide the development of current and future courses at a large Scandinavian business school; academic challenge, interaction and collaboration, engagement and motivation, diversity and flexibility, academic socialization, and personal development and integrity.

The authors describe how these pedagogical principles guided a recent online initiative in which three fully online courses were developed. Based on post-course in-depth interviews with 19 students, the authors discuss to which degree the pedagogical principles were met in the online setting. They conclude that online courses are largely able to support existing pedagogical principles and thereby become an integrated rather than independent form of teaching and learning. Finally, the challenges and dilemmas that surfaced as a consequence of the alignment of the online format and the pedagogical principles are discussed.

1   Introduction

In 2014 Copenhagen Business School (CBS) decided to develop online courses for our daytime students. The reasons for doing so were to experiment with technology to see if it would provide new opportunities for student learning and to meet a request for more flexibility - particularly from students who were away from the university on internships or exchange as part of their studies. While the approach was highly experimental, it was important to make sure that students did not lose out on learning while participating in the experiment.

Early on the lecturers who volunteered to teach the online courses received pedagogical and technological support and training by us – the teaching and learning unit consisting of pedagogically trained academic faculty, instructional designers, and technological support staff. Based on this and CBS' pedagogical principles as the anchor point for all three courses, the lecturers decided how to structure their course and what to include in terms of materials and activities. During the development and implementation of the online format, we were well aware of and also interested in exploring the differences in the lecturers' interpretation of the pedagogical principles in the different online courses and how they aligned with the online learning opportunities.

In this paper we present the findings from this first experiment of offering fully online courses for students at CBS and discuss how online teaching can support existing pedagogical principles and thereby become an integrated rather than independent form of teaching and learning. We realize that many universities have done what we have done; decided to use learning technology to provide online teaching and learning activities. This is not an attempt to

provide new insights into this decision. Instead we seek to provide reflections on how online teaching can be designed and work as an integrated part of the broad array of teaching activities at universities and not as an addendum that needs to be treated differently from a pedagogical point of view. Based on these reflections we argue that online teaching can support and develop the existing pedagogical practice at universities and help them provide students with an even broader learning experience.

The paper is organized as follows: First we describe CBS' pedagogical principles and how we see online teaching at CBS. Second, we outline the pedagogical challenges and opportunities that we have considered in relation to online teaching and learning. Third, based on the first three fully online courses, we discuss how the lecturers in the design of their courses interpreted the pedagogical principles, and how students experienced the pedagogical principles when taking the courses. Finally, we discuss the challenges of online teaching in the light of pedagogical principles before we conclude with suggestions for future research.

2   Pedagogical principles and online teaching at CBS

At CBS we have six pedagogical principles for establishing an engaging and challenging learning environment, which can stimulate our students' motivation for achieving their full potential for learning. The six principles are:

2.1   Academic Challenge

At CBS we are fortunate to have well-qualified students with high entrance GPA. In line with past research, we believe that continuous academic challenge for our students is a main driver for learning (e.g., Kolb, 1984). Therefore the students at CBS must be academically challenged to the full extent of their capabilities to realize their full potential. We strive to create the best possible learning environment for this by means of research-based teaching and feedback, encouraging rigorous acquisition of specific competences as well as reflection and divergent thinking.

2.2   Interaction and Collaboration

We see students and lecturers as partners in the learning process. A lecturer cannot make learning happen without the student's active collaboration and interaction with the lecturer as well as with others students. Furthermore, interaction is an important driver of learning (Vygotsky, 1978). Finally, the skills of interaction and collaboration are core competences for our students to learn, as they will need them in their future careers.

2.3   Engagement and motivation

Motivation and engagement are important drivers of deep learning (Kuh, 2003). Thus, we want our students to be motivated and actively engaged in their studies. We have a strong tradition for engaging our students in case-based learning and to work closely with industry and public sector to train our students to work with real life challenges. We encourage our faculty to motivate our students to engage in learning inside as well as outside the classroom. Since all class participation is voluntary, it is of great importance that we design motivating learning processes which students actively choose to participate in and spend time on. Finally,

since we cannot force students to come to class nor feed them knowledge, it is important to develop learning spaces that allow students take responsibility for their own learning.

2.4 *Diversity and Flexibility*

CBS wants to make room for flexibility and diversity in terms of study pace, learning styles, special needs and physical location. CBS is an international business school and we encourage students to go abroad and to learn outside the walls of CBS in order to boost their learning by actively testing their knowledge (Kolb and Kolb, 2005). To support this, we need to provide flexibility as to where students can learn; whether they are on an internship, study abroad at another university, or need to spend extra time on their student job. Consequently, all study programs at CBS are encouraged to make use of the possibilities offered by learning technologies in order to reach the different needs and preferences of students and staff.

2.5 *Academic socialization*

We take responsibility for supporting our students in becoming the students we would like them to be. CBS students have varying backgrounds and come from different countries with different traditions and study practices. We cannot expect them to know what is expected of them as students at CBS. Therefore, we need to support them in their transition of becoming a CBS student and the development of study skills that are known to be important for learning (Turner and Baskerville, 2013). Our aim is to welcome all students and provide the help and support they need in order for them to maximize their learning outcome at CBS.

2.6 *Personal development and integrity*

Based on the capacity and potential of the individual student, we support their development of personal skills. During their studies at CBS, students should not only be trained academically, but at the same time grow and flourish and develop their ethical and social competences. CBS has a strong focus on social responsibility and sustainability; responsible management education is an integral part of our core activities. This requires us to focus on individual attitudes and societal skills on top of academic qualifications.

These six pedagogical principles guide all teaching at CBS and following from this they also guided our online teaching and learning efforts. However, before we discuss the relation between opportunities of online teaching and our pedagogical principles, we describe how we conceptualize online teaching at CBS.

3 How online teaching can support pedagogical principles

3.1 *Online teaching at CBS*

In the following we will briefly define online courses in order to further unfold what special potential we see in the use of online teaching. We define online courses as courses in which teaching is highly mediated by learning technology with no demand for physical presence on campus. The dimensions that make online courses distinct from traditional on-campus courses are 1) the degree of physical proximity between lecturer and students and 2) the degree of lecturer-driven use of learning technology. These two dimensions create four categories of teaching as shown in figure 1 below.

Type A teaching is characterized by a low physical distance between lecturer and student as well as between students and a low degree of lecturer driven use of learning technology. It is typically based on lectures, class discussions etc. This is the type of teaching that we know from traditional on-campus teaching in classrooms. Type B teaching is characterized by teaching activities based on technologies that are used in the classroom by lecturer and students. Examples of typical technologies used in this type of teaching are clickers, games, simulations, and co-writing tools such as Google Docs. Type C teaching is characterized by physical distance between the lecturer and the student as well as between students. Moreover type C teaching is characterized by a low degree of lecturer-driven use of learning technology. An example of this type of teaching is individual project work, e.g. credit-bearing assignments carried out as part of internships. Finally type D teaching is what we define as online teaching. This type of teaching is highly based on technology-mediated activities outside the brick and mortar boundaries of the university by means of video lectures, discussion fora, quizzes, etc.

These four types of teaching activities can be combined in different ways in the courses that we offer our students. While pure type D teaching would comprise an online course, we
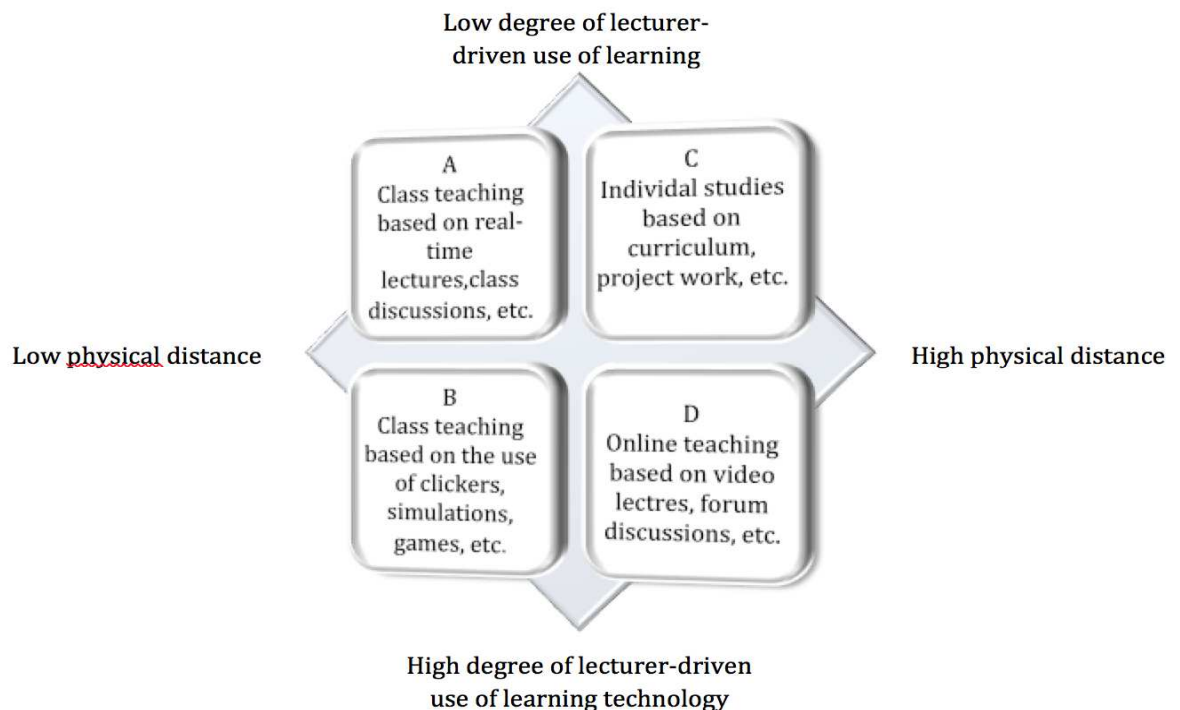

Figure 1: Four categories of teaching (Kjærgaard & Thomsen, 2015)

define a course with type A as well as type D teaching as a blended course. Also, activities in type B and D are often referred to as e-learning (Dohn et al. 2013), which may take place in a brick and mortar classroom setting if we combined elements of type A and B teaching.

High physical distance

What is important to notice is that the specific teaching activities in the different categories of teaching can be very different, even though they might at first seem to be able to replace one another. However, a video lecture and a face-to-face lecture are not identical, since a video lecture does not provide the exact same learning space that a face-to-face lecture provides, and vice versa (Russell and Mattick 2005). This is due to the fact that video lectures provide students with the possibility to access the material in a non-linear way by giving them the option to rewind, pause, and search the content. Moreover video lectures often support interactivity by providing opportunities for students to write and share notes linked to different sequences in the video lecture. The video lecture thereby becomes a shared product that is distinct from dialogue based on-campus lectures.

Additionally, because a video lecture can be watched over and over again it will typically be more concise content-wise and the language will resemble written rather than spoken language. When on-campus lectures are systematically recorded, the lecturer will often change his or her style of expression and choice of language (Young and Moes 2013) to become more formal, less dialogue-based and less contextual. Another example of differences between otherwise seemingly comparable activities in on-campus and online teaching is the difference between the discussions that take place in a classroom and discussions online. In online teaching the right to speak in a discussion forum is not managed and distributed by a lecturer and in principle everyone can participate. This can result in a different group of active participators and in different types of discussions than what is possible in an on-campus setting.

3.2   *The first fully online courses at CBS*

As a consequence of the differences between on-campus teaching and online teaching, online courses at CBS are built from online activities, which, on their own merits, have the potential to improve the learning of the students. Rather than replicating the teaching that takes place in the classroom, cf. the arguments in section 3.1., the aim was to explore how different learning technologies can facilitate student learning while supporting the existing pedagogical principles.

It was a strategic choice to let the first online courses be driven by lecturers' interest and engagement. We decided not to dictate a certain structure, a certain choice of activities or a certain expression. We wanted the lecturer to take control of the process but in a safe environment where pedagogical as well as technological help was offered and available on demand. In other words, it was important for us that the courses were shaped by the lecturers and that their wishes were met. This choice meant that we launched three online courses that had some commonalities with regards to activities but also quite different expressions and structures.

All three courses were 7.5 ECTS credit quarter electives that ran over the course of 8 weeks – two at the master level and one at the bachelor level. The courses were quite popular and a lot of students signed up for them (91, 107 and 47 students were admitted, respectively). All courses used spoken PowerPoints or online lectures of approximately 5-15 minutes duration per topic, with several topics covered every week. In addition all courses had discussion fora, quizzes and

peer grading activities. The lecturers monitored the fora and other activities and contributed on a continuous basis by inspiring, explaining, or summarizing input in the discussions.

Course A)

The lecturer designed a relatively directive process in which the course content was released at certain points in time during the week with relatively short completion deadlines. The spoken PowerPoints or video lectures were released early in the week. Quizzes testing the learning objectives of the week were released at the end of the week and closed again a few days later. Content and deadlines were described in detail in a weekly schedule that was posted early in the week.

Course B)

The lecturer of this course chose a more open structure in which most content was released at the beginning of a week. Deadlines for completing the different activities were more flexible but encouraged the study groups to participate in discussions while they were most vivid. Quizzes testing the learning objectives of the week were released mid-week and left open for three retrials. In contrast to course A, content and deadlines were not described in a separate document but disclosed directly on the learning management system (LMS) course page.

Course C)

The lecturer chose to design a completely open structure in which all content was released at the beginning of the week including quizzes that were left open for unlimited retrials. In the first weeks of the course, the lecturer had suggested to the students that they ought to 1) read, watch video lectures and do quizzes at the beginning of the week, 2) complete assignments and participate in online discussions mid-week, which then 3) at the end of the week would be commented on by the lecturer. In contrast to courses A and B content and deadlines were not described in a special document nor directly on the LMS course page. Instead the lecturer made a weekly 'welcome' recording in a more hand-held and personal style than the more formal video lectures. In these recordings the lecturer spoke freely to the students, describing the particular weeks' topic and assignments and motivated the content from a personal perspective. Hard deadlines were noted in the descriptions of the activities on the LMS platform but other than that the students were free to schedule their workload as they pleased.

3.3 Elicitation of our experiences

On top of the standard student evaluations based on online surveys, we decided to interview stakeholders of the three courses in order to learn from our experiences. Thus we interviewed a group of students from each course after the course had ended (and before the exam), which resulted in 11 individual interviews and one focus-group interview with 8 participants. The interviews were semi-structured, audio-recorded, and transcribed. The interviews revolved around grand-tour questions (McCracken, 1988) concerning the general perception of the course and course activities, contrasting questions (ibid.) concerning perceived difference (if any) between online and on-campus courses, and prompts (ibid.) that allowed us to address specific issues such as students' recommendations for future developments. Based on these student interviews and the experiences that follow from our close interaction with the

lecturers, we now address how the online teaching was aligned with or challenged our pedagogical principles.

3.4   Academic challenge

In the interviews several students mentioned that they perceived their online course to be just as academically challenging as their on-campus courses. As one of the students expressed it: "*Yeah, I was actually really surprised about how effective the course was. I learned so much about [the subject] and I did not think that I would get so much knowledge out of an online course and it did meet all my expectations*"(Ruth). To some students the online setting was even more content rich than their usual on-campus courses. According to some of the students this was partly due to the different nature of online lectures. Charles put it like this: "*The lecturer - and her language - was also much focused and to the point, and sometimes I had the feeling that… I mean the lectures are just 15-20 minutes, and sometimes she said more in 20 minutes than others do in two hours. So I have never listened to it just once, so it took me 50-60 minutes for one lecture*".

Moreover, feedback could easily be performed and saved for future reference in the online setting. According to Beck (2013, p. 46) feedback is the crucial mechanism for challenging students' understandings and the driving factor for learning. Challenging students to the full extent of their capabilities demands continues feedback on performance and support for improvement. The ultimate summative assessment is the exam but the potential for learning can be lost if students are not assessed on a continuous basis and only receive feedback at the end of a course. Our online courses offered formative as well as summative basement options including automated feedback in the form of quizzes or tests, and peer grading processes in which students provided constructive feedback to each other on assignments. These types of technology-based feedback enable the lecturer to provide relevant response even in large classes as the lecturer can provide another layer of feedback on the peer feedback by singling out a set of assignments that were particularly good, bad or displayed typical misunderstandings. To some of the students the idea of giving each other feedback seemed strange to begin with, but the learning outcome was considered to be very good. Being able to see how other students had answered the assignment and to reflect on this by a given set of criteria, added to their learning experience. Just like the other course activities, the peer grading assignment was voluntary. However, students that did not participate were not able to see other students' assignments, which to some worked as a motivating factor for participating.

Thus, in sum, the online courses were able to meet the pedagogical principle of academic challenge.

3.5   Interaction and collaboration

Initially, we worried that promotion of dialogue in our online courses could be challenging in spite of different online options for dialogue. Thus the lecturers created several opportunities for written interaction, while we decided not to use oral interaction due to students' participation from different time zones. Also, a synchronous and written forms of communication are important tools in students' future work environments, and written dialogue provides the opportunity to more carefully consider their input and to deliver a more thorough contribution.

Following from these considerations, the lecturers used open discussion forums in which students were able to share their questions or suggestions. In an online setting this might be more legitimate than in an on-campus setting, in which this would need to be done by addressing the lecturer in class or during a break. As one of the students put it: "*In face-to-face courses you don't really write emails. If you have a question you go ask the teacher during the lecture and you will get an answer. [In online courses], every time you ask the teacher she writes the answer in this online forum so in this way you actually get answers of all the questions that were asked during the lecture, and every student can see the answer and that is a good thing I believe. And you have them in writing so if you forget you can always go back to the online forums and look at what the answer was and that is a good thing*". (Ruth)

Moreover our lecturers created several e-tivities (see Salmon 2013) that motivated in-depth discussions about certain topics and they considered other online activities that provide the opportunity to co-create products in online group work; for example using mind-mapping tools, shared online prezi-presentations or just ordinary online shared documents. However, while the interaction between student and lecturer was regarded as efficient and positive in the interviews, the student-to-student interaction did not seem to work that well. Mathew put one of the challenges in a nutshell: "*I was in a, in a group where no one participated in the activities. The first and the second time, I tried [to participate in the group work] but then there was no response and I just thought that 'I am not gonna upload notes for them'. So I did it for myself*". Based on the interviews this challenge was the result of the voluntary nature of the activities. Since assignments were not mandatory you risked being grouped with students that did not intend to invest time in them, which in turn affected other students' participation. However, after re-grouping efforts some of the groups managed to have fruitful interactions.

3.6 Engagement and motivation

At CBS large class teaching is dominant and students often attend lectures in auditoriums with more than 100 participants. It takes special efforts to engage and activate students in this setting. Often students become passive receivers rather than active participants, which is in direct opposition to the understanding that learning takes place in interaction – between lecturer and student as well as in-between students. Online teaching has the potential of creating engagement by offering a variety of learning activities that students can chose from to design their own learning processes.

An example of this was the quizzes in our online courses. They were voluntary but nevertheless heavily used and very well received by students, here expressed by Ruth: "*I participated in every single quiz. And I loved those. […] It makes you want to read and understand the theory even more to pass the quiz. I was competing with myself because I wanted to do it even better than I did the week before. So I made a kind of […] competition game*". Even if students did not necessarily like the same learning activities, most of them were motivated by the simple fact that they saw online teaching as a new opportunity to be tried out: "*I think just the fact that it is a new kind of teaching method is also fun and interesting*" (Matthew).

Another thing to consider as far as motivation and engagement is concerned is that students already spend a great deal of time online. Online teaching and learning is thus a

natural extension of other activities (Tække OG Poulsen 2013). Where on-campus teaching demands a change of scenery – online learning activities can be completed when it best suits the student. Moreover learning increasingly takes place outside the walls of the university and the Internet as well as social media have become important sources of knowledge for learning. Instead of separating the learning process that takes place at the university from the learning process that takes place outside university, online teaching can bridge the two.

On top of being in charge of *where* to learn, being in charge of *when* to learn was also mentioned by the students as a motivating and engaging factor. In online teaching students actively choose to learn when they open a session, press play on a video lecture etc. This does not guarantee that learning actually takes place (von Konsky et al., 2009), but we assume that the active choice of when to engage can create a certain level of engagement. In contrast, the active choice requests engagement and thereby online teaching is also vulnerable to lack of engagement. Students need to possess a high degree of self-motivation because the social pressure of coming to lectures is absent[1].

Some students also mentioned that their engagement and motivation were extrinsically driven as they did not want the lecturer to notice their low levels of activity, which they thought, were more easily detected in an online setting. As Frank mentioned: *"I am pretty sure that the teacher knows who participates and takes notice [in online teaching] while in class it is just like an anonymous number of people and nobody notices if you are really there or not".* The lecturers were in fact concerned with the level of engagement in the course and they did worry about the lack of interaction in the group work and how they could motivate students to engage more in the discussions in order to create a more lively course as they were afraid that too many students were lurking or did not follow the flow of the course as intended by the lecturer.

3.7   *Diversity and flexibility*

Diversity and flexibility were mentioned by the students in our study as important drivers of engagement and motivation (described above). The two principles are therefore highly interrelated. Because physical proximity was not necessary and because all interaction can be mediated by asynchronous learning technology, online teaching provided a high degree of flexibility in time and space. Flexibility was also mentioned by most of the students we interviewed as the main reason for choosing an online course. Quite a few students were physically located far from Denmark and did not have the option to take courses on-campus:*"I am sitting in [a country far from Denmark] at the moment and doing an internship at the embassy. So of course that was practical and the only way that I felt that I could do a course as well. So it definitely had an impact on why I chose exactly this course."* (Robert)

While flexibility in space was mentioned as a reason for choosing an online course, flexibility in time was also important; as Mathew described it: *"The best part was that I could watch the lectures when I had the time and also that it was possible to go back and use them actively in the exam period. That you could brush up on some stuff you may be forgot. That is more difficult to do with traditional lectures because you have to go back and watch your notes and the lecture slides and maybe*

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[1] Participation is (with a very few exceptions) not mandatory at the Danish universities.

what you are looking for is not there" (Mathew). And Sally explained: "*[Y]ou have a lot more freedom. If you have two weeks where you can focus or you have to travel with your job or do anything else, then you can just skip the class and have maximum focus the next week. And that is really good instead of being there half time or have to stress about not going to class or something like that".* (Sally)

Even flexibility in the learning process at the micro-level was mentioned by several of the students as a very positive feature of online learning; here expressed by Mick: "*You know, if you take a physical course you have one chance to hear the teacher and talk about a topic or something specific. Here you have the chance to rewind the lecture if there is something important that you need to hear several times. That is a really big benefit I think".* And supported by Sally: "*[What] I like about the online part is that you can go back to the videos so if you have missed a point or if you have written anything in your notes […] I like that a lot. I think it is more precise and more structured that you have the ability to go backwards and you don't have that with normal classes at all".*

Consequently our students benefitted from being able to participate in the teaching activities at almost any time and everywhere they saw fit. At the same time the lectures, quizzes, and discussions could be re-accessed at the students' convenience. While this was valuable for meeting learning preferences of different students, thus providing for diversity in students learning preferences, it was also challenging at times. Ruth put it like this: "*Even though the most challenging part of the course is that you have to be self-motivated, the best part of the course is the flexibility".*

3.8   Academic socialization

For some students, the transition process from being a high school pupil to becoming a university student can be difficult to manage. This is partly due to the high degree of freedom, which university students have - especially in a system where attendance is not mandatory - and which forces them to structure their own time. Online teaching can help students to structure time for preparation by offering a learning process, which consists of a series of smaller assignments and milestones. The lecturer may, for example, record short overviews of the topic of the week or the proposed learning trajectory, quizzes for testing knowledge of the curriculum, group work based on the topic of the week as well as dialogue fora where the intended learnings can be discussed, challenged and summarized by the lecturer or the students. As our online lecturers noticed, an online course format forces the lecturer to think harder about the students' learning processes than own performance in the classroom in order to establish the right mixture and the right timing of the learning activities. This seems to be supported by the students we interviewed:"*I think that the online course is much more structured and you keep the time schedule" (Sally).*

However, it is important that students are not treated as high school pupils but learn to take responsibility for their own learning, which might be an integrated logic of online courses as mentioned by Ruth: "*Because I did not go to a physical lecture two times a week, I knew that it was my own… I had to do the readings I had to do it all on my own to hopefully pass the exam. So it also puts a little pressure on me and that was a good kind of learning I think, because we are just used to going to the lectures and getting all on a silver platter, but now you actually had to do the work yourself".* Even students who honestly admitted that they had expected the course to be easier to complete than

an on-campus course, were quite positive about the online course's structuring effect on their study process; as mentioned by Mathew: *"It's been a good way to structure my readings, to read it throughout the course. That has been positive, definitely".*

To conclude this section on our findings, the online courses were in most cases able to align with the pedagogical principles. As far as the last principle – personal development and integrity – is concerned, the relatively low interaction between students limited the opportunities to work with this topic. However, the topic of netiquette (how you interact in written communication on the Internet) was discussed and several students acknowledged the lecturers for their very polite comments and feedback. Likewise the lecturers felt that students were considerate and kind when they posed questions or needed help.

4 Discussion and conclusion

As we have shown above, we found that online teaching in the first fully online courses at CBS aligned with CBS' pedagogical principles. The courses provided flexibility in learning and connected learning outside of CBS to learning on-campus, they offered a broader set of activities for building interesting and varied learning processes and they motivated and engaged students. Likewise online teaching supported dialogue and interaction and if the course design guided students' learning processes, students were able to take responsibility for their own learning.

We found however that the balance between structure and flexibility proved to be a dilemma to many students. They enjoyed and had also, in many instances, chosen the online courses exactly because of the flexibility that they believed the course would provide. However, they also liked the structure and the structuring effect of the way the courses were run, which to some degree limited flexibility.

For example, the clear structure in course A worked to keep students on track. As some assignments and tasks were not released until mid- or late week and as completing them was a prerequisite for solving the quiz at the end of the week, the students had to participate in the course more frequently than in a lecture based on-campus course. Thus, not surprisingly, a repetive theme in the post-course student interviews was the revision of their expectations concerning the flexibility and workload in an online course. Their experience was somewhat contrary to their expectations; most of them experienced that they had to work as structured and hard or even harder during the week. As expressed by Michael:" *[J]ust because it is an online course doesn't mean that you have less work to do than just a regular course. Because I think the amount of effort is pretty much the same".* And Petra mentions:"*This course was much more structured. The lecture was opened on the Monday and then you had to watch it before Wednesday because then you had the assignment. I think it was very much like an on-campus course. This course could have been given as an on-campus course just as well. I would have liked it to more flexible as I am also travelling in the semester".*

All lecturers communicated the structure of their particular course to make sure that students knew about it. However, the structure had its price as several students from all three courses commented on the lack of flexibility that it caused and which hindered a more individually designed learning process. Also, in spite of the provided information, the

structured format came as a surprise to some students, as described by Mathew:"*I think that you should make it more clear, I know that you cannot force people to do the activities but it think you should make it more clear in the course description that there are activities that should be done throughout the week because I think a lot of people were surprised by that. I have talked to some of the others who were enrolled in the course and they were surprised by that. I think it is a good idea but people just need to be aware of it*". He continues to talk about the workload he experienced:"*I think that when all comes to all I have spent the same workload but it has been a bit different because in other courses, in traditional courses you may not read that much throughout the course, you do it when you have the exam. And I've been.. It's been a good way to structure my readings to read it throughout the course. That has been positive, definitely*".

Thus, structure compromised flexibility, which seemed at odds with students' expectations in online course settings. However, structure also provided options for improved learning outcomes and was therefore welcomed by several students once they had revised their initial expectations. Also, it is evident from the interviews that students realize that flexibility is not entirely beneficial – there is a flip side of the coin as also mentioned by the focus group: "*A positive feedback about this course is the fact that you are able to structure your homework more or less as you want to. [...] So it is very flexible compared to regular lectures. [...]This flexibility also means that I know for a fact that a lot of my fellow students are simply just pushing everything up to the very end of the course when the exam paper is supposed to be written, so a lot of them will be inactive in the course, making the participation a whole lot less*".

To sum up, our conclusion is that online teaching can align with our pedagogical principles, if the lecturer takes responsibility for designing a coherent reflective learning process that challenges the students and facilitate students to challenge each other. Moreover, having a mix of online and on-campus courses in the course catalogue further strengthens the implementation of our pedagogical principles since it adds to diversity of teaching and learning processes at our institution.

5   Research limitations and direction for future research

The empirical study of this paper is limited to three fully online courses at a single university. We do not know whether our findings are replicable in other settings or if they are linked to the special status of the courses: they were the first fully online credit courses at our institution, the lecturers were highly motivated and had volunteered to develop the courses, the students were excited about the new course format, and the lecturers received special attention from support staff. All of these factors may have had an impact on how these courses were designed and, following from this, how they aligned with the pedagogical principles. However, since the aim was to explore whether or not online teaching could in fact support our pedagogical principles - and not whether *any* online course would do that – we can conclude that this was in fact the case.

While we have focused on how the students experience online teaching, future research should also address the role of the teacher and how it changes when teaching is conducted online. In particular it is interesting to understand how the teacher can facilitate student learning by combining online teaching with on-campus classroom teaching in order to create the best possible learning opportunity for the students. While technology supports some types of

learning, others types might not benefit from technology – the balance and mixture of technology supported teaching with on-campus face-to-face teaching and its impact on alignment with pedagogical principles needs to be explored in future research.

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Effective Facilitation Methods for Online Teaching

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The demand for a flexible educational opportunity led to the 'anytime, anywhere' distance learning based on technology-mediated instructional designs. Such educational design integrates a multi-sensory approach to maximize learning opportunities and outcomes. Learning in this format is goal-oriented and centered on the learner, driven by personal situations of time and distance, as well as work and family responsibility constraints. This paper examines effective facilitation methods for online teaching and principles of best practices for use in an online nursing learning program. The aim of such a review is to ensure adequate online instructional designs the goal of which is to maximize students' learning opportunities and outcomes. The needs of online learners reflect those of face-to-face learners and more due to physical and geographical distance. The unique characteristics of the learner and the adult learning principles guide the behaviors of the instructor in online nursing programs. Effective facilitation methods of online teaching entail commitment on the part of the management in educational institution in creating an integrative learning environment that promotes a sense of community, social presence, and connectedness with resources that facilitate personal and collective interactions between and among faculty and students.

1. Introduction

Accelerated changes propelled by technology characterize the 21st century. The technology has greatly influenced higher education in general, and nursing education in particular. Twenty-first century learners have perceptive technological abilities, and are interested in participatory active learning of technology-delivered education. Revell and McCurry (2010) maintained that educators have demonstrated an understanding of the learners' perceptive technological abilities and needs by adopting teaching strategies that incorporate technology and focus on active learning for efficient outcomes. The teaching strategies entail the design, development, and implementation of instructional designs that integrate a multi-sensory approach to maximize learning opportunities and outcomes.

Instructional designs that integrate a multi-sensory approach occur through the World Wide Web in three different formats. The formats range from web support to hybrid, and web-based (online) delivery strategies (O'Neil, Fisher and Newbold, 2004; Sandars and Lafferty, 2010; Bristol and Zerwekh, 2011). These delivery strategies apply technology in varying degrees. According to Bristol and Zerwekh (2011), in a web-supported course design, the instructor uses a learning management system (LMS) to enhance the traditional classroom teaching and learning experiences. Continuing, the authors maintained that the web-based or online design entails the delivery of the entire course content via a computer network, while a hybrid or blended course design combines the attributes of online and traditional face-to-face delivery

format. Each of these delivery formats appeals to different kinds of learners depending on circumstances and learning styles.

The web-based or online modality known as e-learning is an educational trend in a virtual classroom for individuals who have conflicts with the traditional learning options. Learning for such individuals is goal-oriented and centered on the learner, driven by personal situations of time and distance, as well as work and family responsibility constraints. In order to maximize learning opportunities and outcomes, instructors and learners separated by geographical or physical distance use technological innovations in various configurations, instructional methods, and presentation formats of web-based learning (Cook, et al., 2010) to interact in a synchronous (real time) or asynchronous (delayed) manner. The different modes of written communication and interactions between and among students and faculty are the core of online teaching and learning. According to O'Neil, Fisher and Newbold (2004), online learning will be a lonely and isolated experience without active quality interaction between and among students and faculty. Active quality online learning experiences entail a great deal more than mere posting of class materials and content on the web (O'Neil, Fisher and Newbold, 2004; Gallien and Oomen-Early, 2008; Floyd, Hughes and Maydosz, 2011). Effective facilitation methods for online teaching and principles of best practices for use in an online learning program such as nursing derived from literature ensure adequate online instructional designs the goal of which is to maximize students' learning opportunities and outcomes.

2. Literature Review on Effective Facilitation Methods for Online Teaching

The learner is at the center of any effective teaching and learning process irrespective of the delivery format, but more so in online format due to the absence of physical connectedness. In the absence of physical contacts, the learner actively and independently, or in collaboration with other learners, interacts with the learning environment, which consists of content, faculty, activities, and peers in order to construct meaning and knowledge (O'Neil, Fisher and Newbold, 2004). Facilitation methods for the learner-centered instructions in the online teaching environment focus on attaining the critical success factors of online teaching based on the learner's characteristics and needs. The learner's characteristics and needs guide the instructor in the creation of specific instructional design techniques in a positive learning culture and social presence through online communities that meet the needs of the students. According to Bonk and Zhang (2008), effective online teaching methods address the needs, expectations, and learning styles of the different types of online learners. Such teaching methods maximize learning opportunities for efficient learner outcomes.

3. Characteristics and Needs of Online Learners

Knowledge of the characteristics of online learners ensures effective presentation and delivery of learner-focused instructions. According to Palloff and Pratt (2003), online learners are composed of traditional and nontraditional undergraduates, graduates, and continuing education students of varying generations, cultures, learning styles, reading and writing abilities, computer literacy skills, and social and economic statuses, as well as educational experiences and expectations. Each learner's characteristics bring a wide variety of attributes to the learning experience that affects their online learning abilities (Sandars and Lafferty, 2010).

The Net Generation, unlike the typical adult learner, grew up with technology and routinely uses computers, cell phones, and the Internet as a means to communicate, socialize, obtain information, and complete school or work-related assignments (Mastrian, et al., 2011). Palloff and Pratt (2003) categorized successful characteristics of online learners into seven general areas that include computer access and skills, openness, communication skills, commitment, collaboration, reflection, and flexibility. Similarly, O'Neil, Fisher and Newbold (2004) noted that successful online students are highly self- motivated, self-directed, independent, active learners capable of adapting to new learning environments and possessing organizational and time management skills.

Based on these characteristics, the instructor develops a learner-focused, self-directed online learning experience. The instructor facilitates learner-focused learning through the ability to be flexible, collaborate, and move away from the traditional faculty role by giving up control to the learners. According to Palloff and Pratt (2003), these instructor characteristics form the core of the effective facilitation skills for online teaching. Rather than being expert authorities, the instructors in an online learning environment facilitate, mentor, and coach the learner's acquisition of knowledge in a way that promotes active involvement and self-direction. Self-directed active learning based on the constructivist view of learning, where learners construct meaning based on collaboration and interaction among themselves and instructors, has positive effects on the academic success of online learners (O'Neil, Fisher and Newbold, 2004; Bell, 2007; Shinkareva and Benson, 2007; Legg, et al., 2009). Supporting these studies, Mei-Mei and Chiung-Mei (2009) noted that students learn better when given control over their learning. Similarly, McCown (2010) and Merriam (2008) affirmed that self-directed learning is an empowering process that helps students learn how to learn for themselves and motivates adult learners. Three factors of self-directed learning, notably active learning, love of learning, and independence were significant predictors in online learning effectiveness of civil servants (Lai, 2011). Overall, self-direction, with its inherent autonomy and responsibility for one's own learning, entails adult learners' active participation and involvement in their own learning for efficient outcomes.

The needs of online learners for efficient outcomes reflect those of face-to-face learners and more due to physical and geographical distance. The physical and geographical distance mediated by technology necessitates a user-friendly around-the-clock strong technological infrastructure with technical support (Palloff and Pratt, 2003; O'Neil, Fisher and Newbold, 2004; Cornelius and Glasgow, 2007). A user-friendly technological infrastructure provided by the learning institution facilitates effective online teaching through the design of an efficient online learning community and the creation of learning activities that promote interaction with the course content, the instructor, and the learners.

4. Instructional Design Techniques in an Online Learning Community

The creation of online learning communities facilitates effective online teaching. The learning community, characterized by interaction and collaboration, is the central feature in online teaching and learning for the delivery of the curriculum (Palloff and Pratt, 2007). The learner-content, learner-instructor, and learner-learner interaction is a critical success factor in

the level of student learning and satisfaction in a technology-mediated environment (O'Neil, Fisher and Newbold, 2004; Gallien and Oomen-Early, 2008; Maring, Costello and Plack, 2008; Ali, 2009; Mastrian, et al., 2011). According to Mastrian, et al. (2011), online communities facilitate effective online teaching by fostering collaboration and shared learning, which stimulates reflective and critical thinking for high-quality learning experiences. Such interactions using appropriate synchronous and asynchronous communication tools eliminate the physical, timing, and geographical isolation of online learning environment to build a community where learners have a sense of belonging and connection to an institution for a collaborative learning experience. The technology-mediated communication tools facilitate effective online teaching as they align with the characteristics and needs of online learners.

Literature abounds and supports technology-mediated online communities as a critical factor of effective facilitation methods in online teaching and learning experiences. Developing an online learning community facilitates online teaching by enabling the instructor to effectively design the course, create collaborative assignments, facilitate active discussion, and promote the development of students' critical thinking and research skills (O'Neil, Fisher and Newbold, 2004; Palloff and Pratt, 2007; Ryman, et al., 2010; Bristol and Zerwekh, 2011; Mastrian, et al., 2011; Wong and Abbruzzese, 2011). Such active and collaborative teaching yields co-created knowledge and fosters transformational learning. Online learning communities facilitate transformative learning through the instructors' creation of active instructional strategies that meet individual learning styles.

Effective online teaching involves students' engagement and active interaction with the environment according to their individual learning styles. Learners have a combination of visual, auditory, and kinesthetic learning styles that are applicable to different learning situations. According to Bonk and Zhang (2008), the reading, reflecting, displaying, and doing models of learning styles and preferences, which closely align with the verbal, auditory, reflective, and kinesthetic (VARK) learning styles, provide a framework for the design of efficient online learning environments and activities. Each learning style has corresponding learning preferences and activities with matching technological resources and tools for efficient learning outcomes. The integration of varied classroom instructional strategies through the application of the different appropriate media technology enable the instructor to meet the learners' different styles and preferences for learning (Palloff and Pratt, 2003; Bonk and Zhang, 2008; DeYoung, 2009). Online teaching methods incorporate varied teaching strategies such as lecture, discussion, questioning, and use of audiovisuals, as well as the more active teaching strategies of cooperative learning, simulations, role playing, demonstration, concept-mapping, reflection/journal, case studies, problem-based learning, and self-learning modules (DeYoung, 2009; Rowles and Russo, 2009). Media technology facilitates the integration of active teaching strategies in the online learning experience.

Media technology that uses models, images, audio, and videos integrated with the teaching strategies enables instructors to create meaningful teaching and learning experiences (Zwirn and Muehlenkord, 2009). According to the authors, these media, typically categorized as realia and models, projected and non-projected still visuals, moving visuals, and audio media create an active teaching and learning online environment. Overhead transparencies and slides

are the commonly used projected still visuals while photographs, diagrams, symbols, and posters are non-projected still visuals. Video-related technologies that incorporate stored motion pictures such as video on the World Wide Web, digital versatile disks (DVDs), and compact discs (CDs) are moving visuals commonly used in the classroom to dramatize concepts and help learners make necessary connections. Interactive hands-on experiences as in simulations, games, and role-plays use realia and models to mimic real world situations for active teaching and learning experiences. Literature abounds with evidence to support the benefits of incorporating media technology into instructional designs for effective online teaching (Palloff and Pratt, 2003; Alinier, 2007; Bonk and Zhang, 2008; DeYoung, 2009; Bristol and Zerwekh, 2011; Lewis and Ciak, 2011; Lynch-Sauer, et al., 2011; Siegrist, Garrett-Wright and Abel, 2011). The different media technologies engage learners with learning materials for efficient outcomes.

Students' engagement through the technology in an online community encompasses both formal and informal interactive learning experiences. In addition to fostering formal collaborative learning that meets different learning styles, online community environments build a positive learning culture and social presence that offer the learners much more than course knowledge acquisition (Bristol and Zerwekh, 2011; Mastrian, et al., 2011). Through these communities such as that obtained in the cyber café section of an online course design, learners socially and personally interact on non-course-related topics as they seek help on a variety of issues, support one another, and create long-lasting relationships. Generally, instructional design techniques with appropriate media technology align with the varied learning styles and characteristics of successful online learners. Such design techniques meet the needs of online learners through an online learning community and make up the effective facilitation methods for online teaching. The effective facilitation methods for online teaching undergird the principles of best practice for use in online nursing programs.

5. Principles of Best Practice for Use in an Online Nursing Program

Learning institutions design online nursing programs mainly for Registered Nurses (RNs) who need advanced nursing degrees for both personal and professional reasons. These nurses are generally adults with work and family responsibilities and a desire for the flexibility of distance learning mediated by technology (Cornelius and Glasgow, 2007; Magnussen, 2008; Legg, et al., 2009). The adult characteristic features of RNs result in practical, problem and goal-oriented, highly self-motivated, and directed learners with a variety of prior work and life experiences. In order to meet the needs of these adult learners, the nurse educator utilizes adult learning principles to ensure best teaching practices that maximize learning opportunities and outcomes. The best teaching practices are the teaching and learning strategies that enhance the quality of the online nursing program by meeting the needs of the instructors, learners, and the learning institution. High quality and flexible learning instruction, the guiding principle of best practice for use in an online nursing program, entails a radical shift in the traditional roles of the nursing program learning institution, the learners, and the instructors. The success of an online learning program largely depends on the values and goals of the learning institution, the instructor, and the students (O'Neil, Fisher and Newbold, 2004; Appana, 2008). Commitment on

the part of the learning institution, the faculty, and the students underlies a well-supported online nursing program and constitutes the principle of best practices for efficient outcomes.

6. The Learning Institution

Best practices for use in an online nursing program entail effective processes, practices, and infrastructure provided and maintained by the management in educational institution of the nursing program. According to O'Neil, Fisher and Newbold (2004), institutional standards, mission, philosophy, policies, and strategic plan should be dynamic and supportive of the online teaching and learning process. Such standards and policies should identify learners and instructors capable of succeeding in online programs and strive to meet their needs. Johnson (2008) noted that faculty members in an online nursing program are either teaching courses they developed themselves or by others. Institutional policies and standards govern the design, development, and implementation of such courses. Adherence to institutional policies increase instructor's course facilitation for best practice measures (Schulte, 2009). In addition to the policies, the degree of the success of the design, development, implementation, and evaluation of online instructions is contingent on the willingness and efforts of the learning institution to provide initial and ongoing technical support, equipment, and training to both faculty and students (Cornelius and Glasgow, 2007; Johnson, 2008; Magnussen, 2008; Zsohar and Smith, 2008; Fish and Wickersham, 2009). The training and support will enable both faculty and students to be comfortable with the required technology and unique demands of online educational system for optimal teaching and learning experiences.

While faculty needs technical support, training in online pedagogy, considerable workload, and compensation, students need adequate training in the required infrastructure and technical support in addition to all of the services available to the traditional face-to-face learners to ensure connectedness to the learning institution. Access to a user-friendly technology delivery system is an essential driver of best practice in online nursing program. Constantly changing hardware and software used in the online nursing program in an attempt to save costs may compromise quality of instruction. Keeping current with technological innovations and developing a culture that supports and encourages such innovations among faculty, staff, and students contribute to best online practice. Almala (2007) noted that such a technological culture entails effectively building and maintaining a strong e-learning infrastructure; establishing high standards for developing, designing, implementing, and evaluating courses; and strengthening faculty and learner support systems. Although adult learners have embraced technology, many of them are not very competent and continually struggle with completion of assignments and desire ongoing technical training (Darrington, 2008; Calvin and Freeburg, 2010). Around the clock live technical support is essential for both faculty and learners to alleviate the frustrations associated with technological inadequacies that may interfere with successful online learning experiences. Orr, Williams and Pennington (2009) contended that in addition to the technical support, institutional administrator's recognition, and adequate compensation of the time and skill required for online teaching contribute to online teaching excellence. Such recognition and compensation motivates faculty and drives their commitment to meet the needs of the online learner for best practice outcomes.

7. The Online Learner

RNs in online nursing programs are adults with adult learning needs and characteristics. According to Almala (2007), these learners are busy individuals seeking flexible and quality goal-oriented adult learner-centered learning experiences to enhance nursing skills, or earn academic and professional certification. In order to meet the needs of these learners, adult learning principles and theories as a framework for understanding how adults learn guide successful design, development, and implementation of the learning experiences. According to Palloff and Pratt (2003), using the principles of adult learning theory helps to meet the needs of the virtual student. The principles of adult learning theory are evident in the behaviorist, humanist, cognitivist, social cognitive, and constructivist adult learning orientations (Merriam, Caffarella and Baumgartner, 2007). Each of these orientations reiterates contrasting but related adult learning principles that apply to online learning. The behavioral and to a larger extent, the constructivist learning theory through the inherent collaborative active learning strategies that enable learners to personally construct knowledge based on past knowledge and experiences best aligns with online learning (O'Neil, Fisher and Newbold, 2004; Magnussen, 2008; Legg, et al., 2009). The essential tenets of constructivism theory that enable learners to construct meaning by interacting with one another, the faculty, and the learning materials, in addition to the adult learning principles, make up the best practices on the part of the learners for use in an online nursing program.

Adult learning principles, the cardinal goals of adult educational theories influence the teaching and learning processes of RNs in every teaching delivery format, but specifically to a greater extent in online learning experiences. The self-directed, internally motivated, goal-oriented, problem-based collaboration learning activities and a variety of prior experiences' principles of adult learning guide the online learning practices. The concepts in these adult learning principles shift construction of knowledge and control of learning to the learner. The self-regulation and monitoring abilities inherent in the self-direction principle account for the retention and success in online programs. Yu-Chang, et al. (2009) asserted that learners in web-based learning environments use planning with the calendar, monitoring progress with the online grade book, adjusting study routines, note-taking strategies, and seeking help when needed as varieties of self-regulated learning strategies for success. Supporting the self-monitoring and self-directed abilities of the learners, Appana (2008) noted that students' participation in and completion of online courses is entirely up to them. Consequently, the successful online student organizes learning time and schedule without external reminders, interacts, communicates, and keeps up with the learning requirements (O'Neil, Fisher and Newbold, 2004). Based on the self-directed principle of adult learning, best practices in online nursing program focus on the autonomy and ownership of learning responsibility of the learner. This principle underlies the instructor's roles and activities in the analysis for course sequence and content in the curriculum, the design, development, implementation, and evaluation of online course programs.

8. The Instructor

Adult learning principles guide the behaviors of the instructor in online nursing programs. According to Johnson (2008), adult learning principles integrated in web-based instruction have resulted in a paradigm shift in nursing educators' philosophy of teaching and roles as instructors. The instructors, comfortable with technology and knowledgeable of the pedagogy of online teaching and learning facilitate learner's self-directed construction of knowledge. The pedagogy of online teaching and learning entails considerable time-intensive activities (Gallien and Oomen-Early, 2008; Johnson, 2008; Magnussen, 2008; Zsohar and Smith, 2008). Gallien and Oomen-Early (2008) noted that the issue of time commitment in terms of workload might influence learning outcomes. Self-assessment of technological skills, teaching style, and online pedagogical ability identifies instructors for the design, development, implementation, and evaluation of learning experiences for best online teaching practice.

Designing and developing nursing courses for best online teaching practice demands the expert content knowledge of the instructors in collaboration with the web-design team. Dunlap, Sobel and Sands (2007) contended that successful online programs entail course design strategies and contents that actively and intellectually engage learners; promote critical reflection, and positive educational experiences. Such positive educational experiences integrate problem-centered learning opportunities that enable learners to engage in meaningful interactions with the learning content. Similarly, Hutchings, et al. (2007) asserted that key learning design principles for active and constructive learning include variety, action, application, interaction, feedback, scaffolding, and evaluation. These course design principles enable appropriate design and development of web-based learner-centered courses that facilitate best online teaching practices and student learning. Familiarity with the electronic features of the LMS enables the design and development of courses in such a logical sequence that facilitates easy navigation and access to course materials and requirements. According to Li and Irby (2008), attending online education workshops, conducting literature reviews on best practices for online education practices, and networking with other instructors experienced in online course design, development, and implementation enhances the effectiveness of novice and experienced online instructors. Best practice effective course design and development based on online techniques recognize the nature of the learners, optimizes learning, and facilitates implementation of the course materials.

Effective implementation of the designed and developed online course depends on the instructor's forefront clearly written communication of faculty and learner's expectations that substantiates the course syllabus. Specific, respectful instructions on faculty and learner expectations regarding emails; general and private questions; grading rubrics for discussions, examinations, and assignments; discussion board and cyber cafe expectations; institutional policies on cheating and plagiarism; and requirements and due dates for assignments and discussion postings guide learners' activities and expectations for optimum learning outcomes (Gallien and Oomen-Early, 2008; Zsohar and Smith, 2008; Vitale, 2010). In this way, the instructor functions as a facilitator and guide in the collaborative learning environment as students direct their own learning. Such instructor roles promote learners' active involvement and ownership of learning responsibilities for efficient outcomes. Literature reveals that clear

communications that facilitate the learner-content, learner-instructor, and learner-learner interactions are significant for successful online learning experiences (Palloff and Pratt, 2003; O'Neil, Fisher and Newbold, 2004; Gallien and Oomen-Early, 2008; Li and Irby, 2008; Zsohar and Smith, 2008; Ali, 2009, Fish and Wickersham, 2009, Lassitter, 2009). Lassitter (2009) asserted that clear written communication through which the instructor offers guidance, nurturing, and mentoring is the essence of successful online instruction. The personal and collective interactions and communications between and among faculty and students in the different sections of the LMS prevent feelings of isolation, connect learners to the learning institution, and make up effective principles of best online teaching practice. Gallien and Oomen-Early (2008) affirmed that the interaction and communication promotes a sense of community, social presence, and connectedness. The sense of community provided by the various interaction and communication strategies mediated by the instructor predicts student satisfaction, retention, and learning in an online nursing program.

At the end of the learning experiences, through the learning institutions' evaluation policies and strategies, both learners and instructors provide evaluation data used to strengthen the online learning experiences for continual best practice. Generally, using effective online pedagogy and technology in combination with the tenets of the adult learning principles and constructivist learning theory through clearly written communication of faculty and learners' expectations make up the principles of best practice for use in an online nursing program.

9. Conclusion

Technological innovations mediate lives and learning in the 21st century resulting in optimal instructional designs that facilitate teaching and learning processes for efficient outcomes. Such instructional designs integrate the multi-sensory strategies of the World Wide Web to engage learners with the learning experiences. The resulting instructional design formats range from web-support to hybrid, and web-based (online) delivery strategies that appeal to student needs and styles of learning. The goal is educational learner-centered opportunities that enable them to construct knowledge through collaborative, engaging, and interactive learning experiences for efficient outcomes.

The web-based or online modality is an attractive trend of 21st century learners. The demand for a flexible educational opportunity for the working adults led to 'anytime, anywhere' distance learning based on technology-mediated resources. Review of literature on effective facilitation methods of online teaching revealed instructional design and delivery strategies that maximize online learning opportunities to meet the needs of online learners. Such instructional design entails building online community and uses different media technology to address the needs, expectations, and learning styles of online learners.

On the other hand, online teaching and learning has challenges for the management of the educational institution, instructors, and learners. Technical support, cost, time commitment, communication and organizational skills, increased workload, technologically savvy, feelings of isolation, and difficulty in ensuring academic integrity constitute challenges that may affect online teaching and learning.

The instructional designs of the online learning modality in nursing programs mainly address the needs of RNs who desire advanced degrees for personal or professional reasons. Integrating adult learning principles in the design of online instructions for RNs through the facilitative interactive activities of the learners themselves, the learning institution, and the instructors ensures principles of best teaching practices that maximize learning opportunities and efficient outcomes for RNs.

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Promoting a culture of innovation & entrepreneurship in Saudi Arabia: Role of the Universities

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Saudi's mission to diversify its economy depends heavily on innovation and entrepreneurship. The discussion evaluated the role of universities in building a culture of innovation and entrepreneurship in Saudi Arabia, employing a literature review and gap analysis method to design an approach for universities to play the aforementioned role. The literature review reveals that the role played by universities entails providing entrepreneurship education, providing support resources, and partnerships with non-academic institutions, while the gap analysis undertaken reveals that Saudi Arabia has made significant strides towards equipping its universities to contribute to innovation and entrepreneurship, but lags behind the top ten leaders.

The proposed initiative model entails seeking strategic alignment between university contributions and local and national economic goals, collaborating with international institutions to replicate best practices in Saudi Arabia, and establishing formal frameworks for partnerships with relevant stakeholders in innovation and entrepreneurship. Upon evaluation, the main arguments for the model rest on its focus on strategic alignment and partnerships, while counterarguments involve bureaucratic restrictions on innovation and entrepreneurial spirit owing to formal frameworks with the government, as well possibilities of exportation of ideas and benefits away from Saudi Arabia through international partnerships. To address the aforementioned concerns, the stakeholders will need to address bureaucracy, allow inclusive participation, and strengthen implementation of intellectual property rights.

Introduction

Saudi Arabia has recently sought to diversify its economy in a bid to transform it from being heavily natural resource based, with a focus on improving human capital and creating a knowledge-based economy being a mainstay for Saudi economic planners and leaders. Salem (2014A) argues that innovation and entrepreneurship are pertinent factors behind Saudi Arabia's ambitions in economic diversification, besides noting that the country has established over 65 tertiary education institutions since the mid twentieth century. The rationale for such expansion in higher education lies in the need to develop human capital and stimulate innovation and entrepreneurship. Today, the goal is to transform Saudi Arabia into a global innovation and entrepreneurship leader in preparation for the eventual depletion of oil

resources. However, the country still lags behind current global innovation and entrepreneurship leaders despite opening many tertiary education institutions (Mehta, Vaidya, Chaudhary, Ramamrajan, & Ranjan, 2014). In light of this observation, research into how universities can contribute to innovation and entrepreneurship in Saudi Arabia is necessary. The present investigation seeks to establish the role that Saudi universities should play in promoting a culture of innovation and entrepreneurship in the country, exploring the curricular developments and partnership models necessary. The undertaking entails a literature review leading into a methodology for the role of universities in promoting an innovative and entrepreneurial culture, which then allows designing of an initiative model for education alongside accompanying arguments and counter-arguments that help generate crucial recommendations.

Literature Review

A number of scholars have examined the role that universities have played, can play, and should play in promoting innovation and entrepreneurship in societies and economies. The analysis of literature entails thematic categorization into the role of universities in undertaking entrepreneurship education, providing support infrastructure and resources, and establishing partnership models with non-academic institutions.

Entrepreneurship Education

One of the crucial ways in which universities can contribute to a culture of innovation and entrepreneurship is through undertaking entrepreneurship education, with the knowledge spillovers into society then helping stimulate entrepreneurial spirit and innovation beyond the educational setting. A study by the Organization for Economic Co-operation and Development (2009) explores entrepreneurship education in institutions of higher learning, employing a case study approach to evaluate the contribution of universities in the field of entrepreneurship. According to the study, several universities have established centers for entrepreneurship and technology transfer centers that seek to stimulate entrepreneurship and innovation within and beyond the universities. In such centers, the purpose of entrepreneurship education entails training students and other interested parties in entrepreneurial skills, such as creativity, problem-solving abilities, conflict management, communication, and negotiation, employing lectures and business simulation games in such education. The entrepreneurship courses and workshops exist as course modules in such universities. Entrepreneurship education is a core part of curricula in some courses, such as business administration and other business-inclined courses. However, the approach taken by some universities in offering entrepreneurship education outside business courses demonstrates how they help nurture entrepreneurship and innovation in the wider population. In this case, some universities offer all modules as elective units open to all students, as exemplified by the approach in the University of Applied Sciences Jena.

In another study, Vicens and Grullón (2011) explore how some universities have approached education in entrepreneurship and innovation, citing some institutional approaches as models that can be replicated elsewhere in the world. For instance, Stanford University employs a Design Thinking approach to train students in entrepreneurship. Design Thinking

approaches entrepreneurship education from the perspective of principles that can be tutored to and utilized by people from diverse academic levels and backgrounds. Irrespective of academic level and background, Design Thinking centers on employing the individual's sensibility and methods to match people's needs and wants with products that are technologically feasible, and for which a viable business strategy can convert into customer value and accompanying market opportunity. Ultimately, this approach links innovation with viable entrepreneurship, besides applying to individuals from diverse backgrounds in a way that promotes entrepreneurial and innovation culture. Meanwhile, entrepreneurship education at Babson College emphasizes holistic and integrative learning in a way that makes entrepreneurship a lifestyle, demonstrating contribution to entrepreneurial culture.

A study by Efi (2014) explores the various ways through which universities and other tertiary institutions of education promote entrepreneurship in society. In the study, the scholar observes that entrepreneurship education in universities can enable a society develop and produce more entrepreneurially inclined individuals. Universities play a crucial role in providing the much needed entrepreneurial knowledge and skills necessary for enterprise growth, as well as equipping individuals with adequate knowledge, skills, and capabilities in proper business management. However, the role played by the universities in promoting the culture of education not only concerns the education aspect, but also changing the mindset of individuals regarding the place of entrepreneurship in society. Here, universities also help change the attitudes of individuals in ways that create positive perceptions toward self-reliance and self-employment. In addition, universities help create awareness of entrepreneurship as a career option for individuals, helping promote entrepreneurial spirit in society.

Providing Support Infrastructure and Resources

Universities can help promote a culture of innovation and entrepreneurship in an economy through providing supportive infrastructure and resources. The Organization for Economic Co-operation and Development (2009) notes that universities can offer important resources that support innovation and entrepreneurship, beyond education and research in the two fields. The Organization provides examples of the infrastructural and resource support that universities can offer, including providing support to startups establishing business incubators. In addition, universities can establish support programs and create access to networks for future, emerging, and existing entrepreneurs. Establishing entrepreneurship research centers also provides another way through which universities can employ their resources in helping build a culture of innovation and entrepreneurship. Support may also be through providing a network and contacts to business support providers and financiers.

Wells' (2014) study also observes that universities play crucial roles in supporting innovation and entrepreneurial spirit through establishing business parks or incubators in which individuals within and outside the university can access a collaborative and conducive environment for business creation and technological development. In such business and technology incubators, individuals can access resources that may be unavailable to them outside large corporate organizations with massive research budgets. In addition, universities can aid promising individuals and startups with seed money to pursue their projects. Through

expanding the number of people accessing innovation and entrepreneurship development opportunities, universities help widen the culture of innovation and entrepreneurship beyond traditional boundaries.

Partnership Models with Non-Academic Institutions

Noting that research in entrepreneurship may not necessarily translate to supporting entrepreneurship in society, Wells (2012) proposes more emphasis on contract research approaches that have a direct link to entrepreneurs and innovators in society. Here, the scholar observes that many universities have research labs capable of undertaking research for the direct benefit of startup businesses. At the same time, many universities have departments and centers devoted to excellence in industrial design and prototype development, underscoring their high potential for innovation. Meanwhile, startups may be missing key or final pieces to complete innovation puzzles, or may be limited in capabilities in areas such as prototype development and industrial design. As a result, universities can establish direct partnership arrangements with such startups, enabling collaborative processes that allow startups to benefit from the opportunities, resources, and human capital present in universities. Such actions would help accentuate entrepreneurial and innovative capabilities in society.

Tornatzky and Rideout (2014) indicate that universities can promote innovation and entrepreneurship in society through undertaking boundary-spanning entrepreneurial activities and technology transfer through establishing community and industry partnerships. The aspect of moving beyond university boundaries entails instituting policies and practices that move research and action beyond traditional disciplinary structures, crossing the boundaries that exist between universities and the private sector world. Meanwhile, boundary-spanning technology transfer involves universities participating in the translation of innovative research into commercially viable intellectual property through collaborating with startups and pursuing industry partnerships. According to the Organization for Economic Co-operation and Development (2009), universities establish partnerships to external startup and nascent companies, cooperating with national commerce ministries and agencies to help nurture innovation and entrepreneurship.

Methodology

The proposed methodology for exploring the role that Saudi universities can play in promoting a culture of innovation and entrepreneurship in the country entails using the findings from the literature review and undertaking an audit of the current role played by Saudi universities in nurturing societal innovation and entrepreneurship. The next step entails exploring the current state of innovation and entrepreneurship in Saudi Arabia and the country's goals, alongside the strengths and areas in need of improvement in innovation and entrepreneurship in Saudi Arabia. The aforementioned activities help identify gaps and opportunities in present efforts, which then enables the discussion of a model for the role of universities in promoting a culture of innovation and entrepreneurship in Saudi Arabia.

Current State and Emerging Trends in Saudi Arabia: Innovation and Entrepreneurship, Role of Universities

The National U.S.-Arab Chamber of Commerce (2010) explores developments and promise in entrepreneurship in Saudi Arabia, noting the realization of the importance of an entrepreneurial culture in the growth of the economy. Entrepreneurship promises to be crucial to the Saudi economy, as small and medium-sized enterprises (SMEs) already constituted 92% of businesses in the country and employed over 80% of the workforce. Supporting their growth through furthering innovation and entrepreneurship will only translate to a more vibrant economy, which is a pertinent factor for success in Saudi Arabia's ambition to diversify its economy. National U.S.-Arab Chamber of Commerce (NUSACC) observes that Saudi Arabia aims to become one of the top ten most competitive nations in todays, an ambition that necessitates developing a vibrant knowledge-based economy. NUSACC indicates that the Saudi administration and policymakers are aware of the need for a new generation of creative individuals and forward-looking entrepreneurs in attempts to become a top economy that does not rely on natural resources. As a result, the country has established universities aimed at promoting innovation and entrepreneurship, chief among them the King Abdullah University of Science and Technology. This university is a graduate-level state-of-the-art research university that bears an Innovative Industrial Collaboration Program (KICP). The KICP seeks to foster partnerships among local, regional, and global organizations interested in nurturing entrepreneurship. In addition, the university aims at strengthening the link between academic research and economic growth, underscoring Saudi Arabia's awareness of the need to harness tertiary education in boosting innovation and entrepreneurship. Salem (2014B) agrees, observing that Saudi universities are creating a network of research centers, besides producing, spreading, transferring, and utilizing knowledge, and collaborating with local and international businesses.

However, some observers indicate that Saudi Arabia needs to do more to reach its ambitions in diversifying the economy through entrepreneurship and innovation. Rahatullah (2013) undertook a study to map the entrepreneurship ecosystem in Saudi Arabia, appreciating the efforts undertaken by the government, learning institutions, and the private sector in stimulating entrepreneurship. However, he also established that the country still has significant room for improvement in entrepreneurship and innovation. The scholar concludes that Saudi Arabia needs to start new study programs aimed at supporting entrepreneurship throughout the kingdom, develop and strengthen more enable entrepreneurship institutions, and develop heightened awareness of entrepreneurial activities and entrepreneurship in the Kingdom. Such recommendations point to a need for more involvement in innovation and entrepreneurship promotion by universities.

Mehta, Vaidya, Chaudhary, Ramamrajan and Ranjan (2014) also observe that Saudi Arabia is pursuing a heightened role of innovation and entrepreneurship in the economy, but note that the country is at crossroads today. The scholars indicate that most of the countries occupying the top ten competitive innovator positions have achieved strengths in human capital, research, strong institutional frameworks, and high quality output, depicting well-developed entrepreneurship and innovation ecosystems. The scholars provide a comparison of Saudi Arabia's innovation ecosystem with that of other regions from which the top performers

in innovation exist (Figure 1). Although Saudi Arabia's highest score (40/100) is in institutions, this aspect is also where the country lags the top performers farthest (over 90/100), with Mehta, Vaidya, Chaudhary, Ramamrajan and Ranjan (2014) calling for improvements in the institutional framework for innovation. Such findings indicate gaps in the role played by universities in contributing to a culture of innovation and entrepreneurship in Saudi Arabia.
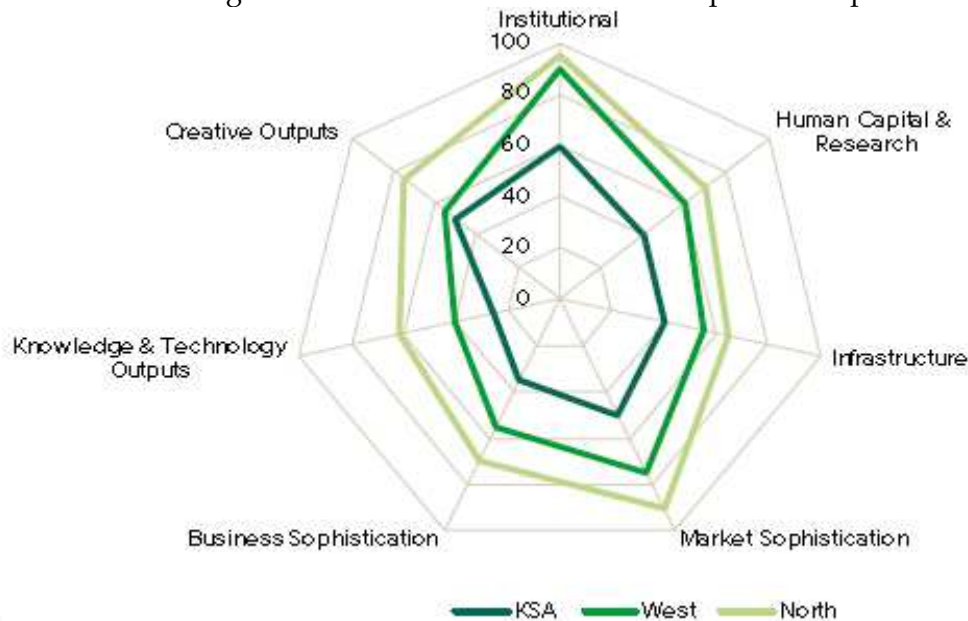

Figure 1: Saudi Arabia's innovation ecosystem, demonstrating room for improvement before the country can catch up with the top performers (Mehta, Vaidya, Chaudhary, Ramamrajan & Ranjan, 2014).

Initiative Model

The discussion indicates that Saudi has already established many universities with the potential to stimulate innovation and entrepreneurship in the country. However, there are gaps in the role played by such universities in promoting an innovative and entrepreneurial culture. The proposed model entails three parts, namely, strategic alignment, collaborating with international universities to establish and meet best practice standards, and formal frameworks for external partnership and networking.

Part 1: Strategic Alignment

This aspect concerns the need to align university innovation and entrepreneurship initiatives with the economy's mission and objectives. In this case, one of the reasons behind the observed gap between establishing universities and gaining from them in sparking entrepreneurship and innovation may arise from the lack of strategic objectives. As a result, a core part of the model should entail linking university innovation and entrepreneurship activities with local and national economy goals, all aimed at transforming Saudi Arabia into a top ten innovator. Such strategic alignment should also involve linking the role of universities with other aspects of the national strategy towards diversifying the economy.

Part 2: International Collaborations to Replicate Best Practices

The initiative model also entails establishing collaborations with international tertiary institutions that provide state-of-the-art examples and proven practices through which universities have been able to stimulate and support entrepreneurship and innovation in communities. For example, Stanford University and Babson College among other higher education institutions drawn from the developed and developing world can offer ideas that Saudi universities then localize to the country to great effect.

Part 3: Formal Frameworks for External Partnership and Networking

The last part of the proposed model entails the establishment of formal frameworks that ease and encourage partnership and networking with external non-academic entities. Formal frameworks will specify channels, provide linkages, and enable support of cooperation and collaboration between universities and external parties such as startups, established business, government agencies, and non-governmental organizations.

Arguments and Counterarguments

The main argument for the initiative model revolves around how it addresses current gaps in how Saudi universities contribute to innovation and entrepreneurship. In this case, pursuing a strategic fit between university efforts and local and national economic ambitions gives direction and strategic goals towards which universities can work. In addition, pulling in the same general direction through the proposed strategic alignment will enable concerted efforts and gains rather than dispersed efforts that contribute less to the desired knowledge economy. Another argument for the model arises from how the proposed partnership with foreign institutions will enables leapfrogging towards current best practices in how universities can contribute to an economy's innovation and entrepreneurship ecosystem. Further, the strategic alignment and formal frameworks for external partnerships will enable the country to benefit from existing resources in Saudi universities, bridging the institutions with the national economy.

One of the major counterarguments to the initiative model arises from the view that establishing formal frameworks and policies for strategic alignment may restrict innovation and entrepreneurship through introducing government bureaucracy in the system. In addition, the measures may result in curtailing of freedom of thought, which is pertinent for the creative process behind innovation and entrepreneurship. At the same time, collaborating with foreign institutions may result in ideas and inventions being exported through partnerships with such international universities, benefitting other economies rather than Saudi Arabia.

Conclusion

In a bid to create a knowledge-based economy, Saudi Arabia has invested in many universities recently. Scholars indicate that universities can help nurture a culture of innovation and entrepreneurship through entrepreneurship education, providing support infrastructure and resources, and establishing partnership models with non-academic institutions. An analysis of the state of Saudi Arabia notes gaps in innovation and entrepreneurship that translate to opportunities for universities to contribute in establishing the desired culture and ecosystem.

The gap analysis undertaken helps generate an initiative model that prescribes strategic alignment between university activities in innovation and entrepreneurship and local and national economic goals, collaborations with international universities to establish and meet best practice standards, and establishment of formal frameworks for external partnership and networking. The following suggestions will help address the counterarguments identified in the initiative model.

- The concerned stakeholders should establish modalities that ensure bureaucracy and other hindrances to creative processes do not accompany the strategic alignment sought between university activities and broader government economic ambitions.
- The stakeholders should strengthen intellectual property practices to protect against loss of ideas and products through the foreign partnerships formed through the initiative model.
- The implementation of the measures proposed to make universities more useful in promoting a culture of innovation and entrepreneurship should be participative and inclusive, enabling the stakeholders to own the process outside the formal structures established.

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Domain identification and stereotypes: representations of scientists among Romanian elementary school students

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The goal of the current study is to investigateelementaryschool students' domain identification andtheir representations of scientists compared to other professions (e.g., teacher, veterinarian).Research shows that students' stereotypes about scientists may affect their science self-efficacy and interest in science (Losh et al., 2008). Studies investigating children's representations of scientists using the Draw a Scientist methods (DAST) indicates that most students hold stereotypes about the role of the scientist and about the identity of a scientist. Findings from such research show that there is a bias regarding the demographics and gender variations in children's representations of scientists (Finson, 2002). A large number of scientists are depicted as white males; Hispanics and Asian scientists are underrepresented and women are depicted mostly as "superwomen". The sources of these misconceptions are various, including media, children's literature, and lack of students' experiences with the work of a scientist.

This proposal is a work in progress; data collection will be completed in October 2015 and data analysis will follow up shortly after all data will be cleaned and organized. Participants (approximate N=200) will be elementary students from Romania enrolled in public and private schools, in both rural and urban areas ranging in age and grade level (i.e., grades 1 to 5). Study findings will be discussed in relationship with research related to gender and cultural stereotypes, as well as research about conceptual change. Additionally, implications for teacher practices, teacher education, and student career preparation will be discussed.

1. Introduction

Recent reform initiatives in various countries around the world aim at preparing a scientifically literate work force that is capable of competing in an increasingly scientifically and technologically oriented global economy. In line with education reform suggestion initiated by the national education agencies, effective teacher practices are described as instructional approaches geared toward students' conceptual understanding (i.e., the use of inquiry-based learning, authentic activities), communication of scientific ideas, assessment-based instruction and the integration of technology in science teaching.

In addition to studying student academic achievements, or their attraction to a science or technology career, educators and national agencies monitor the composition of science and technology students and workers. For example, although US female participation in life and health sciences rose significantly in recent decades, women still lag as physical science or engineering students or professionals; African-Americans and Hispanics are underrepresented

in most science and technology fields. Research comparing science and technology occupational distributions over time suggests some changes in these proportions for women but comparatively few for African- or Hispanic Americans since the 1980s (National Science Board, 2006). Because of common beliefs that youth become psychologically involved with—or disengaged from—science long before they enter college or choose careers, the onus often falls upon early school experiences to stimulate the acquisition and nurturance of science interests among children.

Research (i.e., Losh et al., 2008; Finson, 2002) shows that children and public at large (among them teachers as well) have misconceptions and hold stereotypes about the nature and role of science, about the work of scientists, and about the image of scientists (who are the scientists and what do they do). Among these misconceptions, in the US studies, scientists were depicted as individuals serving greedy corporations, playing God, tempering with nature and misusing technology (Funk, 2003). Other misconceptions were related to scientists' gender and ethnicity; scientists were by large depicted by children as white males; Hispanic and Asian scientists are underrepresented, and female scientists were occasionally depicted, most of the time as "superwoman" (Flicker, 2003). The sources of such misconceptions are often media, children's literature, or students' lack of experience in interacting with scientists. Most teachers rely on limited resources for teaching science oftentimes because of lack of science resources, or use traditional teaching methods versus using authentic activities (i.e., working with a scientist in a lab) and inquiry-based teaching methods. Recent reform calls in the US and UK encourage teachers to think differently about science and mathematics teaching by adopting inquiry-based methods, promoting student critical thinking skills such as "think like a scientist" approaches, and use authentic activities. Because of the difficulties encountered by teachers in "translating" the reform suggestions into their daily classroom practices, teachers tend to adopt traditional ways of teaching (i.e., lecturing, teacher-directed instruction), despite the reform calls for student-centered and inquiry based instruction (Sharp et al., 2011; Smith & Southerland, 2007).

Research show that relatively few elementary teachers are adequately prepared to teach science effectively, and very often, they hold negative attitudes toward teaching science (Bryan, 2003; Lumpe et al., 2012). Additionally, many studies report feelings of low science teaching efficacy among elementary teachers (i.e.,Hayes, 2002; Smith & Southerland, 2007; Sharp et al., 2011). Low science teaching efficacy are related to the lack of preparation in science and mathematics of elementary teachers during their teacher education program, and a weak preparation in using inquiry based teaching strategies (emphasized in the educational reform reports). Also, lack of opportunities to participate in science professional development programs among elementary teachers add to their low confidence in science teaching (Smith &Southerland, 2007; Whitcomb, 2008; Lee, Hart, Cuevas, & Enders, 2004). Research conducted in the US and the UK investigating teachers' personal beliefs find that elementary teachers report a lack of confidence in teaching science due to their lack of science content knowledge, or effective science teaching models. Studies from the UK show the importance of teachers' gaining self-efficacy in science teaching by engaging teachers in collaborative work (i.e., team teaching, school professional teams) and learning from more experienced teachers that can serve as models for them (Sharp et al., 2009, 2011). Oftentimes, increasing teaching confidence is a result

of increasing the pedagogical and content knowledge in a particular area (Dixon &Wilke, 2007), and therefore increasing student science academic achievement.

2. Purpose

The current study aims at investigating Romanian elementary school students' representations of scientists compared to other professions (e.g., teacher, veterinarian). Participants (approximate *N*=200) will be elementary students from Romania ranging in age and grade level (i.e., grades 1 to 5). Additionally, participants will be recruited from different schools for maximum variation (i.e., variations in grade level, rural and urban settings). For instance schools located in both urban and rural settings are targeted, as well as private and public elementary schools. Studies on this topic have been conducted in western countries (i.e., US, UK, Australia), however there is a lack of research in this area in Eastern Europe, especially in Romania.

3. Research Questions

The main research questions addressed by the current study are:
a) How do Romanian elementary school students' pictorial depictions of scientists compare with their depictions of other professionals?
b) How do student demographic and cultural data (e.g., gender, ethnicity and grade level) influence their depictions of the occupational incumbents?

4. Data Sources

The primary data are children's depictions using DAST (Draw a Scientist). In addition to the representations of scientists, other professionals are added in the current proposal and are studied, such as portraits of teachers and veterinarians. The rationale is based on the hypothesis that students are able to distinguish among professionals, but will reveal stereotypes: drawing teachers as most attractive and largely female, and scientists as more often male and less attractive. Other quantitative data used in the current proposal are students' demographics, such as age, gender, ethnic membership, SES, rural or urban setting, private or public school.

5. Proposed Data Analysis

The current proposal is a work in progress. Data collection will be completed in October 2015 and data analysis will follow up shortly after all data will be cleaned and organized. The first step in data analysis consists in data coding. Students' depictions of scientists, teachers and veterinarians are the primary data for coding. A numerical code will be assigned to each drawing based on several categories (i.e., clarity of picture, gender, ethnicity etc). The coding is based on Barman's (1999) list as a base to score the children's drawings. Barman's coding categories included gender, figure color, and physical appearance features that could relate to gender, such as head or facial hair, body shape, cosmetics. Also part of coding will include characteristics related to whether the student's drawing appeared to be some kind of nonhuman rendering, such as a "fantasy" figure or a "monster". Additionally, coding will include the presence or absence of the same occupational details (e.g., animals, syringes, lab coats, head lamps, chalkboards, books) for each professional figure: teachers, veterinarians, or scientists.

After data coding, quantitative analysis will consist in comparative analysis (i.e., ANOVA, MANOVA) to explore variations among depictions with respect to student demographic variables. Findings might show stereotypes in depiction of certain occupations due to school setting (rural versus urban setting) or students' SES status; professional gender preferences/stereotypes among students (i.e., teachers being represented as females and scientists and veterinarians as males); and variations in grade level (i.e., less stereotypes at higher grade levels, such as 4th and 5th). Study findings will be discussed in relationship with teacher practices, implications for teacher education and research regarding conceptual change.

6. Discussions and Conclusions

Findings from prior studies using "Draw a Scientist Test" methods (DAST) suggest that students see scientists as largely white, often unattractive men; one consequence may be that girls and minority students feel a science career is "not like me". However, a major shortcoming in prior research is that scholars have asked children to draw only scientists, thus making interpretations of earlier research findings ambiguous. In the current study, students were asked to draw other professionals to compare how drawings of teachers, scientists, and veterinarians by elementary school children varied by student gender, ethnicity and grade. The current research study is a follow up of another study (Losh, Wilke, & Pop, 2008) in which K-5 students from different grade levels (*N*=206) in the US were assessed in their understanding of domain identification.

Several major contribution of the current study can be discussed. First, the comparison of different professions (i.e., scientist, veterinarian, teacher) allows us to better understand if children have stereotypes only for "scientists", or for other professions as well. Secondly, the current study involves elementary students from Romania. Thus, findings from the current study conducted in Romania could bring contributions to understanding cultural differences related to children's and public understanding of science, the role of science and of scientists, and how this information might be related to the approach used in science teaching. Western countries (i.e., UK, US, Canada) have implemented gradually for almost two decades reforms in STEM education encouraging teachers to use inquiry-based strategies in their teaching. This instructional approach emphasizes features like, promoting student critical thinking (e.g., "think like a scientist"), self-regulated learning and a student-centered instructional style. Some of the Eastern European countries recently started adopting a focus on STEM education, but this is not a nationwide effort.

Teachers' role is significantly important in addressing and correcting students' misconception about the role of science and scientists. Providing students with various instructional modes (i.e., active, inquiry based) and experiences would facilitate students' conceptual changes about the nature of science. Teacher professional development can provide valuable opportunities to teachers to work with a scientist in an authentic environment (e.g., in a lab) and learn knowledge and skills that are consequently transmitted to students. Such programs, like the Research Experience for Teachers (RET) in the US are beginning to gain more support and have been shown that teachers make significant gains when learning in a cognitive apprenticeship model with a scientist (Dixon & Wilke, 2007; Pop et al., 2010). Similar models to

RET can be adapted to Romania where the educational system provides very little support for teachers' professional development in the STEM area, and such models of professional development (based on cognitive apprenticeship with a scientist) are needed.

Additionally, research findings show that teacher' beliefs are at the core of teachers' behaviors, professional identities and classroom decisions (Richardson & Liang, 2008). Understanding the key factors that impact conceptual change and professional learning can help teacher education programs tailor their instruction and provide field experiences that would develop prospective teachers into highly qualified teachers. Additionally, examining cultural aspects related to teacher training variables is crucial for teachers' professional development and could help future research and educators to understand aspects possible related to student achievements.

6. Research Limitations and Future Directions

One limitation of the proposed study could be related to students' demographic data. Participants are all elementary school students and the majority of Romanian students are white (with ethnic membership to Romanian, Hungarian, or Roma). The study is restricted to an age range from 9-11 years old students, and there is very limited ethnic variety among the Romanian student population. Additionally, the type of data collected could impose some limitations on study findings. Students are asked to draw three professions in one sitting (i.e., scientists, veterinarians and teachers). Young children are limited in how many drawings they can produce in one sitting, and also limited with respect to the quality of drawings they produce.

Future studies could address these limitations and focus on including systematic extensions to other jobs to assess where scientists "fit" as occupational incumbents. It will also be helpful to consider other student characteristics and relationship with the type/quality of drawings produced. For example, do high academic achievers depict scientists differently from less achieving students? Or, do students with low SES depict professions, especially scientists differently than high SES students?

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Innovative change in the management education accreditation industry

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Keywords
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Management education accreditation is an industry in need of restructuring. Highly concentrated accreditation organizations in the United States and Europe are preserving decades old criteria. Those decades old criteria reflect the state of the industry in different times. Things have changed and with them the very nature of management education and, in no less measure, the monitoring and accreditation norms. . The industry suffers from conceptual and operational flaws. The need for restructuring is evident.

The article provides a review of the structure of the industry today. This is followed by an analysis of the conceptual and operational weakness of the existing frameworks. A possible substitute based on systems and metrics analysis is then explored. Multiple metric-rooted performance parameters provide an overall assessment and lead to an Accreditation Score Card.

Accreditation Score Cards could have tangible impact on the practice of management program, and institution, accreditation process and the assessment of scope, content, approach and effectiveness of management education efforts.

The problem

Management education accreditation industry is an industry in trouble. Highly concentrated accreditation organizations in the United States and Europe are preserving decades old criteria. Those decades old criteria reflect the state of the industry in different times. Times when capital markets were stable, globalization was mild, technology was slow, WTO was a novelty, China was emerging and Japan was pursuing industrial policies. Things have changed and with them the very nature of management education and, in no less measure, the monitoring and accreditation norms. A development that has not escaped the attention of politics in the United States (WSJ, July 8, 2015) the industry suffers from conceptual and operational flaws and is in need of restructuring.

The following article explores potential future innovation within this industry.
The article starts with a brief survey of current approaches to management education accreditation followed by an analysis of the conceptual flaws of those existing frameworks. A substitute is then explored based on systems and metric analysis. The ultimate outcome is an Accreditation Scorecard or a framework delivering a comprehensive management program and institution accreditation validity picture.
Article conclusions could have tangible impact on the practice of management education accreditation. The substitute, if adopted, could change view of what constitutes accreditation and how accreditation outcome could influence the very process of management education.

The accreditation industry: organizations and concepts.

Business education-related accreditation is an industry with concepts, norms and players. An industry that claims value added in terms of visibility, fund raising, innovation, faculty pride and community service (ACBSP 2013). It is, to all appearances, a highly concentrated industry whether in the United States, the prime player, or Europe, the follower. Though empirical evidence of concentration is difficult to exactly establish on a global scale, one can derive a level for the United States, the market leader. AACSB, the leading accreditation agency in the United States claim, in 2014, 502 accredited members (AACSB, 2014) or an estimated 64% of the domestic market (783 programs).Those figures, though rough, reveal a high measure of concentration.

AACSB, the key player and the market leader, was founded way back in 1919. It places relative emphasis on research with ultimate accreditation made dependent on three standards: strategic management, participant's standards and assurance of learning standards. Strategy considerations include mission, resource utilization, quality standards, stakeholder input and "advancement of knowledge in management education". Participant criteria consider student admission, faculty sufficiency and interaction, faculty academic and professional qualifications, faculty management and educational responsibilities. Learning addresses management of curricula and educational learning goals. Schools must also demonstrate possession of financial means compatible with the mission and goals (AACSB, 2014). All in all the processs that could extend over a five year period, is divided into a pre accreditation phase, an initial accreditation phase and a maintenance accreditation phase

ACBSP, the other dominant operator, is less than three decades old and offers another approach to accreditation. It focuses on "teaching excellence and educational outcomes". ACBSP resorts to peer evaluation in order to address issues that include leadership, strategic planning, student and stakeholders' focus, student learning and performance, faculty and staff focus and educational and business process management. ACBSP mission stresses ".....The importance of scholarly research and inquiry and ...... reasonable mutually beneficial balance between teaching and research" Also "encourages faculty involvement within the contemporary business world to enhance the quality of classroom instruction and to contribute to student learning." (ACPSB, 2014)

Europe has a number of accreditation agencies too. Some have strategic alliance with the American operators. The European market leader is EQUIS. It relies on a set of assessment criteria extending over a wide front. They include the environment, institutional status, governance, mission, vision and values, strategic positioning, strategic direction and objectives, strategic planning, quality assurance, internationalization, ethics, responsibility and sustainability and corporate connections. (EFMD, 2014)

A common thread throughout the entire accreditation structure is emphasis on strategy aspects of the operation followed by student and faculty admission and conduct issues. Also a preoccupation with the institution as a whole especially in the case of AACSB and EQUIS.

The flaws.

Current accreditation concepts and criteria are comprehensive and functional. Yet comprehensive as they may seem, accreditation frameworks described above suffer from serious

conceptual (and operational) flaws undermining the very purpose of the effort. This is taking place at a time when legitimate concerns about the quality of business education have long been expressed (The Fiscal Times, November 2, 2011, HBR May, 2005).

- **Seeing events rather than systems.**

Accreditation of a management education effort can best be viewed as a system with inputs, transformation mechanisms, outputs and a feedback loop. For the accreditation process to be effective those elements should be there and should fit within a consequential flow. Yet this is not always the case today.

To illustrate let us consider AACSB's three cluster criteria: strategic management, participant's standards and assurance of learning standards. Careful examination of cluster components would trace elements of input and, to a certain measure, process. Outcome and feedback are barely represented. Market relevance and term performance of the product, a key output and feedback parameter, could, for example, be barely traced. Participant career flow, a key input, cannot be traced either.

- **Creating closed rather than open systems.**

Critical feedback and consequent corrective action are inherent in every system and belong to fundamental system efficacy. Critical feedback could be painful and, more significantly, influence brands and market shares. And is frequently kept at bay.

To illustrate let us recall that current accreditation practices rely on peer review, a practice that is laced with "camaraderie", murkiness and an assumption of responsible self-interest (Fortune, Nov 23, 2015). Critical findings as lack of qualified faculty are not always revealed to client groups under the pretext that critical disclosures could prevent some schools from being candid in self-assessments or undermine their competitive disadvantage. Or, worse still, exacerbate the problem (The Fiscal Times, November 2, 2011).

- **Building barriers rather than bridges.**

Existing accreditation frameworks give the strong impression that they are entry barriers or measures introduced in order to   limit the number of players, discourage new entrants and enhance the concentration pattern of the global management education industry.

To illustrate, again, let us consider AACSB's criteria requiring the "possession of financial means compatible with the mission and goal" and faculty creation of a "portfolio of intellectual contributions". Those are overly blurred criteria that are difficult to measure and place within an objective context. They could justifiably viewed as entry barriers preserving a global industry leadership by certain institutions in the United States and imposing American standards on new comers sizable and strategically significant markets as China.

Projecting a dark tunnel rather than a mirror.

Today's accreditation processes of management programs, and institutions, operate with a maze of terms, concepts, events, actions and functions, some defined and others are not. The result is confusion in projecting the requirements and assessing the outcomes.

Let us take the very term "accreditation" or the act of granting credit or recognition. This term is not uniformly defined by all those involved in the process. There is accreditation and

there is validation and there is certification etc. Shadow terms also abound. Institution mission, faculty research, and institutional strategy are all viewed in different lights and given different connotation by different players. Even faculty research is subject to a wide variety of interpretations. This obviously undermines the accreditation effort making it a jump in the dark instead of an enlightened search for of a better way to do things.

- **Producing clones rather than innovators**

Projection of business schools and business programs against rigid standards could undermine innovative differentiation in products and markets.   Schools striving for differentiation in program structure, coverage, culture, functional specialization etc. could find themselves undermined and outcast.

AACSB has been criticized, for decades, for being monolithic in its development and implementation of standards for achieving accreditation (Andrews and Tat, 1994). Most accredited MBA adhere to a near standard course coverage, subject flow and ultimate program completion (Benis et al, May 2005). Attempts at innovation are few with bias towards worn out issues as leadership (the Economist,   ) Today accreditation processes run the genuine risk of creating clones.

MBA functional subject coverage, sequence and balance provide an illustration. Differentiation in terms other than specialization is seldom the case. The outcome is bland uniformity and institutional submissiveness.

The future: innovative change.

Restructuring is overdue in the management education accreditation industry. This could follow different venues but all will have to congrue with the changing environment of the industry and the very product that it makes. It is the author's contention that a strong measure of innovation is essential. This innovation should be based on a number of premises. Prime among those is the fact that accreditation is a continuous flow and not an intermittent event. Also that accreditation should never constitute an entry barrier to the management education industry.   Output and market congruence should lie at the heart of the process. And accreditation is not the monopoly of the academic community, industry, government and politics are partners in the process.

Accreditation of a management education effort can best be viewed as a system with inputs, transformation mechanisms, outputs and a self-regulating feedback loop. It is a flow where inputs go through the transformation in order to deliver the output. And it is a self-regulating event where a feedback flow would adjust inputs and eventually the transformation mechanism to conditions surrounding the output.

Translating this conceptual framework into an accreditation process would bring us to the following graphic model. It contains all four elements of a system i.e. inputs, transformations, outputs and feedback. Element attributes are contained into a metric or a framework of parameters that constitute, taken together, the ultimate texture of the process.

The accreditation system works with four metrics each dealing with a system component. And all four of them, taken together, lead to a score card. A metric would contain

key performance variables within the system component and a scale of performance of this variable. Metric parameter attributes should lead to the Accreditation Score Card.

It goes without saying that the roots of the score card concept lie into earlier writing and practice by Harvard's Kaplan (Kaplan, 1992)

Figure (1)
Accreditation system model
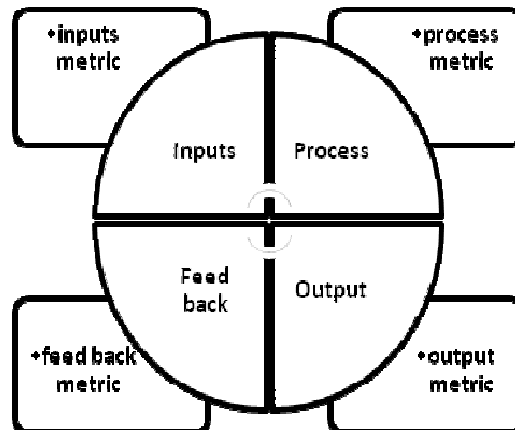
Summary and conclusions.

Management education accreditation is an industry in need of restructuring. Highly concentrated accreditation organizations in the United States and Europe are preserving decades old criteria. Those criteria reflect the state of the industry in different times. Things have changed and with them the very nature of management education and, in no less measure, the monitoring and accreditation norms. . The industry suffers from conceptual and operational flaws. The need for restructuring is evident.

The article provides a review of the structure of the industry today. This is followed by an analysis of the conceptual and operational weakness of the existing frameworks. This leads to a possible substitute based on systems and metrics analysis. Multiple metric-rooted performance parameters should lead to an overall assessment contained within an Accreditation Score Card.

Accreditation Score Cards could have tangible impact on the practice of management program accreditation and the assessment of scope, content, approach and effectiveness of management education programs.

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Capacity building in local government: an analysis for application of competency-based training in South Africa

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Keywords
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Local Government

The purpose of this paper is to provide a conceptual account on the applicability of Competency-Based Training as a model for capacity building in the South African local government. The South African Local government has since the transition into democracy in 1994, invested on workforce development, aimed at improving municipalities' capacity to deliver their mandates as described by the Constitution of the Republic of South Africa, 1996. These efforts are shadowed by the ever increasing levels of service delivery protests, supplemented by unpleasing audit outcomes over the past two decades of democracy. The paper argues therefore that among other challenges of local government in South Africa, is the lack of conceptuality of capacity building as critical aspect of local government strategy. This challenge of the context of local government capacity therefore result in local government being unable to measure the account of capacity interventions in the municipalities. The paper in its purpose will use literature to back-up a hypotheses that using Competency-Based Training as a model in capacity building can be fruitful in the South African local government. On the basis of such a conceptual account the paper concludes that Competency-Based Training can be a driving force behind a professional, competent and self-driven local government workforce, where capacity intervention can be clearly measured.

1. Introduction

At the turn of democracy in 1994, the South African government was tasked with transformation of the government system, to rewrite the apartheid system with a democratic, inclusive and non-racial governing system. The government was thus envisaged to deliver services to all citizens equitably and proactively. This was to be done simultaneously with dealing effectively with the imbalances of the apartheid system (Abedian & Biggs, 1998 in Pycroft, 2000; Nyalunga, 2006). This transformation has found expression in the Constitution of the Republic of South Africa, 1996 (hereafter to be referred to as the Constitution of 1996). The Constitution of 1996 paradoxically mandates the local government to provide the most comprehensive response to the complex developmental challenges of the local communities covering the whole territory of the Republic. This was to be done with the clear consideration of the past imbalances, where municipalities are expected to cater for a black society which was previously deprived of local government services (Zegeye & Maxted, 2002; Makobe, 2002). This history marks therefore a complex footing of the concept of a democratic and developmental

local government, where the municipalities have to champion clearly the democratisation and development of a historically fragmented society.

In South Africa, while institutional arrangements are often deeply flawed, local government has to be transformed from passive service providers to proactive facilitator's of democratic and developmental local government as purported by its founding mandates in the Constitution of South Africa (1996). Local government in South Africa, however has proved to be lacking the strength to live up to such prescripts by the Constitution of 1996. This has manifested in the continuing service delivery protests that swept across the country, and the unpleasing audit opinions by auditor general indicating unhealthy financial immune in the municipalities (Ndletyana, 2007; South African Auditor General Reports, 2013/14). A vital component of strengthening local government is through development of a capable workforce that imparts authority, responsibility and competency over the demanding local government practices. A concept of capacity building contextualises the context in which government in South Africa, design interventions to support and improve their organ's ability to perform a strategic aspect of governance.

The purpose of this paper is to provide a conceptual account of the capacity building in the South African local government, providing analysis for application of Competency-Based Training (CBT, hereafter) as a model for workforce skills development (capacity building). The paper argues that among other challenges of local government in South Africa, is the nature of capacity building offering by skills service provides, lack of conceptuality (conceptual tools) of capacity building as an aspect critical to local government strategy and management. The paper begins by providing the context of local government in South African, local government capacity building, and CBT as a model for capacity building in local government.

2.   Local Government in South Africa

The basis for local government and its role is backed by its crucial aspect of democratisation that manifests in the mass participation of communities on the decision making process about their local affairs. Local government is thus a localised political system that offers services and governing decisions for local people (Faguet, 2005; Watt, 2008; Benhabid, 2006). This means that local government embraces a character of policy priorities that are derived from direct participation by local people. As a political system local government is a product of decentralisation which intends to devolve public responsibilities from centralised government systems to a localised governing body or institutions, giving local people direct influence on the functions and control of such a delivery body or institution (Pauw, 2012; Peters & van Nieuwehuyzen, 2013). Therefore in essence local government is constituted of people, institutions, markets, social groups, and legislatures within a locally defined boundary. These bodies are jointly engaged in the establishment of a local democracy that is beneficial to all members of a given locality.

This system of government is normally referred to as municipalities which collectively forms a single local government sphere covering a given nation (Constitutions of 1996, section 151 (1)). Despite being independent statutory bodies, local government are normally accountable and interdependent to provincial and national governments. Furthermore the extent to which a

local government is local, depends on the context of decentralisation in a given territory, for instance in South Africa, the national and provincial government are charged with supervisory roles on local government with limitation for intrusion on their functioning and exercise of power (Adami, 2002; Holland, 2006; Pretula, 2011). Local government is also required to align its strategies with nationally prescribed policy directions, therefore the policy prioritisation does not depend on local people but to national objectives (Gomme, 1987:1-2; as sighted in ul Haque, 2012). The unavoidable financial dependence of municipalities on national and provincial government limits further the policy preferences and autonomy of local government.

The composition of local government in South Africa, has a long history marked by discrepancies of the apartheid system from which local government is recovering today. Hence recognising the unpleasing past of government in South Africa, the focus of this paper is on the composition of local government in the post 1994 (democratic) period. This is done in order to establish the functions and powers of local government so as to analyse the applicability of CBT in training for competency on current local government trends in South Africa. The Constitution of 1996, creates a multi-sphere system of government, described as a national, provincial and local spheres of government. Each sphere is allocated a status of being distinct, with legislative and executive autonomy. However based on the formation of a unitary government, the spheres are despite being distinct, interdependent and interrelated with each other (Pratchett, 2004; Ledwith, 2005). They thus do not exist in isolation but coevolve with each other as sub-systems of a large government system covering the whole of the Republic. These interdependencies and interrelations manifest in the supervisory and supportiveness of the national and provincial government to the local sphere (Shuman, 2000; Boone, 2003; Craig, 2007). The local government sphere in South Africa serves as a policy implementation platform for a wider framework of the government, where the national and provincial government are for a strong support and supervisory service.

The local government in South Africa is practiced through an array of legislation that structures the operations, functions and powers, taking from the Constitution of 1996. Local government as stated by its objects in the Constitution of 1996, should provide sound local service that promotes economic and social welfare of the local communities. This objects are supplemented by the mandate that local government should be developmental in the administration of its fiscal resources. A developmental local government, can manifest where communities are able to strive economically and socially with minor state intervention (Wibbels, 2003; Watt, 2008). The role played by local government in this developmental capacity of local areas is the establishment of an enabling environment where society learn developmental appetite and explore their potential to develop with minor state intervention.

There are two positions in which the functions of local government can be based in South Africa. Firstly, the scope of local government, is for municipalities and local sphere organs to strive to deliver competently the objects described by the Constitution of the Republic of South Africa, 1996 (Section 151 (1) a-e). This first position of local government can be described by the following as per the objects:

- Local government should provide a democratic and accountable government for local communities. This object indicates constitutional strength of democracy by promoting

that municipalities should be democratic and accountable to the society they serve. It promotes that local government as a political institution should follow the democratic principle as provided for in section 195 (1) of the Constitution of 1996.

- The local government should ensure the provision of services to communities in a sustainable manner. This provision imply that local government should strive to provide services sustainably to the communities, this should be done within the limitations of resources and every increasing challenges communities are faced with.

- Local Government should to promote social and economic development. This is found in the reason that people's quality of life can be enhanced when their economic can social state is improved. Local government is thus charged with the development of economic and social prosperity of its localities, this includes institutionalisation and planning for this development.

- Local government should is to promote a safe and healthy environment for their localities. Local government is therefore increasingly required to deal directly with management of health and environmental related hazards to in the respective communities.

- Local government in South Africa is required to encourage the involvement of communities and community organisation in matters of local government. Thus local government should promote public participation in the matters of the development and services to the community. This practically manifest in the processes of public consultation during IDPs, budgeting and elections.

The constitution clearly stipulates that municipalities must strive, within their financial and administrative capacity, to achieve the objects as set out by the section. The second position in which local government can be grounded in South Africa is that which is provided in the developmental role of local government as purported in the section 153 of the Constitution of 1996. Section 153(a) stipulates that municipalities must structure and manage its administration and budgeting and planning processes to give priority to the basic needs of the community, and to promote the social and economic development of the community. Paragraph (b) of the same section, requires municipalities to participate in national and provincial development programmes. These development related provision are continued in Schedule 4B and 5B of the Constitution of the Republic of South Africa 1996.

3.   Capacity Building in the South African Local Government

Capacity building are frameworks adopted by government as organisational development and human resource tools for responding to the dynamic changes in the emerging trends of service delivery and governance. The delivery of services in the South African local government has shifted from a racially based to a more complex and demanding inclusive democratic dispensation since the 1994 transition. Local government therefore in the democratic dispensation exist in a political sphere, where it has to deliver a constitutional mandate, under guidelines of policy frameworks and direct demands or influence by society (Abedian & Biggs, 1998 in Pycroft, 2000; Nyalunga, 2006). The varieties of competencies require municipal practitioners to deliver services under such complex environment, which ranges from industry

knowledge to catch-ups with new technology and need for innovative, and reflexive thinking. This practitioners are required to integrate politics and administration practices under a complex web of legislation, intergovernmental relations and international standards and competitiveness. In this light challenges of capacity in the South African local government are highlighted by the spring of public service protests, demonstrating the inability of municipalities to meet the emerging trends of society and their needs (Sebola, 2014; Bowman & Kearney, 2011). Lack of specific industry expertise is confirmed by the bad audit results and a high pool of service outsourcing. Noting that financial management skills in the South African municipalities are highly required to rescue local government from such financial dismay, there is a need for professionalization of local government services in the whole of the territory to ensure sustainability of municipalities for service delivery and development.

a. Defining Capacity

The term capacity in Morgan (2006) is viewed as part of development in an institutional practice, owing its existence from individual, organisational, and environmental development. The use of the term capacity in local government is to describe initiatives to improve efficiency arising from institutional economics. Capacity building therefore describes the practice, rules and inputs that shapes effectiveness of any development intervention (Peters, & van Nieuwenhuyzen, 2013). This description is however wide to could possibly cause confusion or misconception, because local government capacity is a multi-dimensional subject consisting of human capacity (individual), institutional capacity, and environmental capacity which can be integrated to produce optimal local government capacity to deliver its purposes and mandates. Such dimensions are comprehensively described as follows;

Individual Capacity

It refers to the potential and competency or lack thereof of a member of an institutions reflected through specific technical and generic skills, knowledge, attitudes and behaviours, acquired through forms of education, training, experience, network and values. In confusion with this Peters and van Nieuwenhuyzen (2013), argues that in the context of local government in South Africa capacity means the appointment of an individual to the post in which their specific capacity can be used to the maximum benefit of the community served. Though this may be another definition of capacity, in the paper the focus is on the former, as the latter is more of gab or post filling than improving the ability to do required work in municipal organisations (see also, CoGTA, 2009). Capacity therefore in this instance refers to the extent to which an individual is able to use skills to produce required work where intervention needs emanates from individuals skills gaps to maximise delivery of their specific performance area.

Institutional Capacity

It refers to potential competency or lack of capacity found within an institution. This include human resource, leadership, partnership, institutional orientation, institutional memory, internal confidence, intergovernmental relations, powers and functions, resources and support system. This refers to the ability of an organisation to apply its existing assets (or acquire new), powers and functions to deliver valued service to the public. This means that municipalities as institutions are able to provide effectively and sustainably services and challenges of the communities they serve.

Environmental Capacity

Environmental capacity is found outside an organisation and as such it is beyond the control of such an organisation. This includes socio-economic and demographic composition, politics, legislation and social capital within communities. Challenges of environmental capacity in local government are mostly found in rural municipalities where municipalities are unable to exercise their duties due to uncollectable revenues. Such Challenges emanated from poverty and unemployment of communities in municipal areas. In this instance the municipality depends greatly on national and provincial government grants which are mainly for capital projects than operational. These environmental challenges are a detriment to developmental local government. Hence self-organisation of municipalities, to find opportunity in this challenges may be a turn to prosperity.

Capacity therefore refers to a performance based concept that inquires and act on the basis of organisations ability to use its resources to deliver its objectives. In the context of local government capacity building is an action based concept that encompasses the interventions by internal and invitation of external factors aimed at improving the abilities of a municipality to deliver its expected mandate (Voorhees, 2001). In essence capacity building is an applied concept in that changes in the effectiveness and efficiency of a municipality should be experienced where capacity is applied effectively (see also: UNDP, 1998: X; CAFRAD, 2004; Sebola, 2014: 636). Capacity building however remain to be defined, in the context of its application by individual organisations in local government to suit their productivity deficiencies and possible improvements.

b. Capacity Building

In the context of the UNDP (1998: X) the concept of capacity building is broader than organisational development, given the three dimensions of understanding capacity. Conceptualisation of capacity building should thus inform a holistic approach. This should be where capacity building is viewed as the intervention structured to facilitate a production of particular outcomes or outputs and where capacity of each dimension supports the ability of local government to be productive. This in essence is an emphasises on the use of complexity theory made. This is to advocate a local government system's ability to coevolve with its environment and constantly change. Therefore interaction and interdependences are critical for such changes (Kuyeza, nd: 5; South Africa, 2012; South Africa, 2008). This underpinning theory argues that capacity building should not only happen in local government, but should include other stakeholders such as provincial and national government in which capacity building may also mean the improving national and provincial governments to constantly improve local government (UN, 2014). In South Africa the national and provincial governments are mandated by an array of legislative frameworks including the Constitution of 1996 that they should ensure capacity building in local government where needed. Thus far local government is facing greater challenges which requires capacity building to be a holistic intervention. National and provincial governments therefore should be capacitated to be able to constantly fit in the capacity needs of local government as the most sensitive sector to change and thus spontaneous.

4.   Policy Framework for Capacity Building in the South African Local Government

The transition of South Africa into democratic state came with many challenges to be addressed accounting for the apartheid government. Developing a defined South African workforce required legislation to be put in place to guide both public and private sector (Pycrof, 2000). Capacity building in South Africa is developed taking guided by an array of legislation promoting the values prescribed by the Constitution of 1996. Capacity building in the South African local government is intended to develop the abilities of local government to deliver expectations of the public guided by nationwide policy and legislation. Section 195 (1)(a) of the Constitution of 1996, states that a high standard of professional ethics should be maintained throughout the government's system. Professionalisation of local government requires formulation of a combination of training methods that would equip local government skills market, capable and competitive personal pool (Lewis, 1994; Klijin, 2008). This professionalisation should develop local government to be an employer of choice, to graduates and experienced professionals. In this principle the Constitution is promoting that local government should be capable of providing effective and efficient government to its local communities.

The Local Government Municipal Systems Act, 2000 (32 of 2000) requires that the employment of municipal managers as administrative heads or accounting officers, or managers reporting directly to the municipal manager must have the skills, expertise, competencies and qualifications as prescribed by the job description. In many cases local government skills demand change due to the emergent nature of trends in the sector, therefore local government skills market will change as influenced by the trends of the sector. In 1999 the Skills Development Act, 1998 (97 of 1998) was introduced to provide and instituted a framework to advice and implement a national sector and workplace strategies to develop and improve skills in the South African workforce. This act was established to operate within the provisions of the South African Qualifications Framework contemplated in the South African Qualifications Authority Act, 1995. Such national frameworks are supplemented by the Skills Development Levies Act, 1999 (9 of 1999), which prescribes a framework for contribution o femployers to the skills development of their workforce as well as how the proceeds from the levies would be distributed to the organs of its purpose. Further affirmative action also promotes training of designated groups in order to eliminate unfair discrimination and promote inclusion. The notion of capacity building in local government was introduced by the Green Paper on Local Government (1997:20), following government's interest on municipal employees' performance. This groundings of capacity building in the green paper outline the contexts in which other spheres of government should intervene in local government capacity matters.

5.   Competency-Based Training

Human resource development for every organisation is critical. Conducting workplace education introduces workforce to various level changes in the industry they serve. Local government has over the past twenty years in South Africa become complex, emergent and situational in such that administering local government now needs a equipped professional body of workers (Naidoo, 2003; Sebola; 2013).Though local government employees may possess

prior-learning in the respective sector qualifications (Finance, Human Resource, Business, Accounting. just to mention a few), the ever changing needs of communities invite a requirement for continuous improvement of local government systems and learning is ultimately a requirement not to be avoided.

Understanding that problem solving in local government is emergent and situational there is a need for workplace training to focus on individuals and organisational competencies that could allow reflexive practices in the emergent trends of local government. Initiating capacity building programmes in this case can be credited, however, there is a need for modelling such programmes to ensure probability and effectiveness (Lankard, 1996; Morgan, 2014). The focus of this paper is to defend a proposition that Competency-Based Training (CBT) can serve as an effective tool for capacity building in the South African local government. Local government workplace education can benefit from CBT as it allows employees to move with training efficiently while maintaining an emphasis of the quality of the work in which trainees are charged with. Therefore progress occurs as the worker-trainees attain competence rather than by serving time on theory that can't be tested on their inherent performance requirements.

In order to understand the concept of Competency-Based Training there is a need to provide a definitional analysis for a South African perspective. CBT has come to dominate industry training and performance practices (Sueivises, 2009). A trend of employing Competency-based approaches in education and training, assessment and development of workforce and retirement have been seen as unavoidable. CBT has been used for succession planning, in which most of South African municipalities remain without quality personnel to replace people who leave the sector, and therefore their organograms remain with some major positions being vacant (Bergin, 2013). Employers and training administrators have turned to competency models for determining the need for business and employers as well as required skilled workers (Bengcheng, 2009; Quick & Nelson, 2009). This models, however, fall within the private sector borrowed models to inform transformation in the public sector. Private sector models are employed for improving efficiency in the public sector. Therefore application of CBT in local government capacity building would assist evaluation and conceptualising the purpose, functions and powers of local government and thereby effectively develop training needs based on the required productivity of local government in the Republic.

CBT finds its expression in the Vocational Education and Training (VET) literature, known as the "Competency Movement", whereby learning is driven by development of a specific competencies for dealing with needs and challenges for a specific industry (Recciardi, 2005; Chang, Wang, Yang, Kinshuk & Peng, 2011). CBT is widely used by organisations to drive workplace learning activities which enable employees to respond urgently and adaptively to work needs. CBT focuses then on enhancing what is expected of an employee in the workplace and embodies the ability to transfer and apply skills and knowledge to new situations (Brownie, Thomas & Bahnisch, 2011). This element of application of knowledge on new situations is critical for local government as an emergent setting by society. The concept of CBT depends on a fundamental principle of demonstrating capacity to perform specified tasks in a given career. It usually requires employees to demonstrate production of a particular task in line with their jobs and therefore identifying gaps to be developed (Naquin & Holton, 2003; Le Deist &

Winterton, 2005; Holton, Coco, Lowe & Dutsch, 2006). CBT can thus be defined as a system for organising, evaluating and instructing aimed at improving knowledge, skills and behaviours for an individual to compete in completion of a specified task. CBT is thus an educative system that emphasises on specification, learning and demonstration of competences that are central for production of a task in a given environment. This concept can be broadly applied in organisation as the exercise that focus on an organisations ability to produce a given objective, and therefore where there are capacity deficiencies, these must be interventions to improve competency for competitiveness and productivity.

a. CBT Practice in Local Government: Lessons from other Countries

CBT has been practiced in local government, mainly in the developed countries. Though there is no evidence that suggest CBT as the only or most effective model to deal with skills development in both public and private sector, it parades a convincing system of training that can be used to improve various levels of technical knowledge required in the local government sphere. For instance in a strategy that is based on emotional intelligence and transformational leadership, CBT may not be sustainably effective when used for training. However it may remain employable for measuring the effects of other method used in the skillsdevelopment of such emotional and transformational leadership skills (Billet, 2001; Blanchard, 2014:1). In the progressive local government of the world, CBTbased framework for professional development is a preferred method for development and assessment. This is due to the complexity of social drivers impacting on local government trends, which requires continual fluctuation of improvement on local government leadership, management and delivery.

While the core of local government practitioner's competencies are managing the job, interpersonal relations, developing people, self-management in the United Kingdom (UK), a national management competence tool is implemented with emphasis on specific industry and sector competencies (UK Employee Organisation for Local Government, 2003). This approach could not really vary from what is branded Sector Education and Training Authorities (SETA) in South Africa, and Local Government Sector Education and Training for the municipalities and local government related workforce. However in the UK, the UK Employees Organisation for Local Government (2003) introduced a concept of "meta-competencies" such as decision-making, communication, impact and influence, personal management, drive and strategic focus. Local government practitioners are tested under a specific template that indicate competencies required for a specific career in the local government system which enables practitioners to take self-assessment boosted by peer reviews to identity professional development need and use CBT for development of such needs.

The New Zealand (NZ) government introduced a public services leadership profile system, following the increase in demand for skilled leaders and senior managers in their public sector including their local government. The profile focused on building a pool of talented managers of the required quality, quantity and diversity to meet the future needs of their dynamic public service (NZ State Services Commission, 2003). A central element of this strategy was making clearly the qualities expected of future leaders of their public sector based on competence assessment, and therefore introduced a CBT approach to develop their skills. A

decade ago Canada was faced with seventy percent (70%) of its public sector workforce exiting after a decade. CBT was thus introduced to recruit and develop a new generation of public service workforce including local government practitioners. In their view CBT and Competency-Based Assessment (CBA) was important to develop a workplace of choice that nurture strong managerial and professional rigor, values all individuals, diversity of ideas and styles, supports risk and foster open communication. CBT was then basically viewed as an instrument that promoted innovation, empowering individuals, challenge creativity, value contribution, manage the local government workload issues and resources while staying focused on a principal mission of delivering to their public's expectations at a global elegance (Aucoin, 2013).

A similar experience was experience in Australia, where a competency framework for local government chief executives and senior manager were established. The strategy focused on developing specific competencies required for the local government officials to compete specific tasks related to the ever changing trends in local government service delivery (Australian Public Service Commission, 2004). These experiences cannot solely make a direct contribution to the application of CBT in the South African local government skills development gaps. There is a need for continuous analysis of the characters of CBT that are relevant to development assessment of skills in the sphere.

6.   Conclusion

CBT as a model for skills development in the workplace specifically emphasis on the requirement for employees to demonstrate ability to perform required work. Worth noting is that CBT should be applied, with the intention of improving the technical know-how of the required work of local government. Other methods should be establish to tackle issues of creativity and innovation in local government. Local government trends have shown characters of complexity, and thus requires researchers and practitioners to design methods that fits the emergent nature of local government trends. The concluding position of this paper is that Competency-Based Training can be a driving force behind a professional, competent and self-driven local government workforce, where capacity intervention can be clearly measured.

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How to Excel in Analytical Decision Modeling

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This paper outlines a course in business analytics that provides a rigorous, logical, analytical, yet intuitive and practical approach to business problem solving using Microsoft Excel. The course concept, methodology and pedagogy are illustrated through a variety of business applications. The course primarily addresses problems involving optimal resource allocation (how to best utilize given resources) and risk analysis (how to analyze decisions involving uncertainty), although some Excel tools for data analysis (how to estimate model parameters) and forecasting (how to extrapolate past observations into the future) are also covered. In each area, we consider specific problems in operations, finance and marketing, build models to set them up on Excel spreadsheets, analyze and solve them using the available Excel commands, tools and add-ins, and study their economic interpretations. In this sense, the course also integrates various functional areas of business management on a common Excel platform. This practical approach to problem solving in Excel has proved to be readily accessible to managers, who usually find spreadsheets natural, intuitive, and user friendly medium for organizing information and performing "what if" analyses, which has made them indispensable tools of modern business analysis.

1. Introduction

Business decisions are challenging because (a) the decision maker has only limited amount of resources (materials, equipment, personnel, time, space, capital), which have to be allocated among several competing activities, (b) outcomes of decisions depend upon uncertain economic environment (raw material costs, product prices, customer demand, competition) that is beyond decision maker's control, (c) decisions are often made sequentially over time, so current decisions should take into account their impact on future decisions and their outcomes, and (d) decisions often have to be based on imperfect information about the environment. The Analytical Decision Modeling (ADM) course, developed over the past 15 years, addresses each of these four areas, illustrated by applications primarily in operations and finance, but also some in marketing.

In general, the problem solving process involves (a) collecting relevant data, (b) building a model to capture the essence of the situation at hand, (c) analyzing the model to yield a solution, and (d) performing sensitivity analysis of the solution. Data collection and data analysis are of course essential to all business activity that emphasizes "management by fact", which the central theme of the business analytics approach to problem is solving. A model is a simplified view of the real world that abstracts away inessential details, identifies patterns and makes simplifying assumptions in order to facilitate its analysis bytoolsand methods of economics, mathematics, statistics, and spreadsheet analysis. The process of modeling involves

tradeoffs: if we simplify too much, the model and its conclusions will not be relevant to reality, but if we do not simplify the enough, the model its analysis will become intractable. As statistician George Box famously said "All models are wrong, but some are useful… ... the practical question is how wrong do they have to be to not be useful. "Finally, given that a model is only an imperfect representation of the real world, it is important that we verify its robustness through sensitivity analysis of model parameters.

The objectives of this course are to learn how to model, analyze, and solve business decision problems involving (a) allocation and valuation of the available resources using mathematical optimization methods, (b) uncertainty in model parameters using probabilistic and simulation methods, (c) sequential decision analysis by decision trees and Bayesian methods, and (d) data analysis and forecasting through time series analysis. We do all this in Excel, with its powerful, yet intuitive, graphic interface.

However, the main emphasis of this course is not on *learning* Excel, but on systematic, logical, analytical thinking and problem solving *using* Excel. Working knowledge of basic Excel is assumed so that we can focus on analytical modeling and problem solving aspects of the course. However, a typical Excel user may not be familiar with more advanced tools, techniques and add-ins that have significantly increased the power of spreadsheet analysis. In this course we introduce and apply these advanced Excel skills, thereby furthering the spreadsheet knowledge base of even an expert Excel user. In particular, we employ Excel's **Solver** tool for decision optimization, **Simtools**and **@Risk** add-ins for Monte Carlo simulation, and **Precision Tree** software for analyzing sequential decisions over time. We also learn Excel's simple, yet powerful tools for data analysis, including **Pivot tables** and **Filters** that synthesize and summarize the available data, and **time series analysis** for forecasting. Thus the experience in spreadsheet modeling and analysis gained in this course help enhance students 'problem solving capabilities as well as Excel skills. And, hopefully, we all have fun doing so!

This course involves hands-on, in-class learning, so attending each class with a laptop, and coming to class well-prepared for active participation in problem solving are essential. Course requirements consist of building, analyzing, and solving models of assigned cases, creating a term project that illustrates a new application of the course material to a business problem of students' choice, and taking a final examination. Homework assignments and the term project may be completed in groups of three members.

The rest of this paper briefly outlines the main topics, along with business applications covered in the course.

2. Excel in Modeling

In this introductory module of three hours, we briefly review basic (and not so basic) Excel. Starting with the basics of developing formulas with relative and absolute cell referencing, and drawing and editing charts, we learn Excel tools such as *Goal seek* and *Solver*, as well as Excel's powerful *Data Tables* for sensitivity analysis. We do this through three applications: break even analysis, monopoly pricing, and buy versus lease decisions, learning along the way few financial functions such as NPV and PMT. Homework consists of two financial applications.

3. Optimal Resource Allocation

In this major course module of nine hours, we cover optimal allocation and valuation of limited resources as *the* fundamental problem of economics and management. Although the underlying methods of optimization are mathematical in nature, we do everything in Excel, which consultant Sam Savage calls as "tearing down the algebraic curtain". We start with linear optimization for a product mix problem set up in Excel, and use Solver to get the optimal solutions well as the sensitivity report. We learn the important concept of a shadow price and study its economic interpretation. We illustrate these concepts further with a blending problem. Binary optimization is illustrated by a project selection and product promotion problems, while bond portfolio selection and workforce planning problems illustrate integer optimization, and production planning involves mixed integer optimization. The module concludes with nonlinear optimization to construct risk-reward tradeoffs in portfolio selection. We also cover more advanced "array functions" in Excel including matrix multiplication. Homework consists of three cases involving product mix, blending, and production-inventory planning.

4. Risk Analysis

In this major module of 12 hours, we introduce uncertainty into decision models. After briefly reviewing basic probability and Bayes rule through a performance evaluation example, we introduce Monte Carlo simulation as a natural method of analysis through sampling from a given distribution. We then introduce single period inventory problem, and solve it three different ways, based on economic, probabilistic and simulation methods. We then develop binomial, Poisson, and normal distributions as models of uncertainty, and illustrate their applications to problems of revenue management, cash flow analysis, and competitive bidding. We also develop and analyze some advanced models of pricing stocks and options, and optimal stopping. The goal is to illustrate how such mathematically advanced models can be analyzed much more easily and intuitively through simulation in Excel. Finally, we consider sequential Bayesian decision analysis with information, with application to real options.

5. Data Analysis and Forecasting

In this short module of three hours, we illustrate Excel's simple but useful *Pivot tables* and (*Auto and* Advanced) *filters* for data analysis and develop forecasts by *Exponential smoothing* with trend and seasonality. This illustrates again the power of Excel in performing these computations with ease and intuition.

6. Course Materials

Although we do not follow any book closely, the recommended text for the course is *Practical Management Science*, by Wayne Winston and Chris Albright, which is in its 5th edition, published by Cengage Learning, 2016. The main required course packet consists of cases for classroom discussion, homework assignments, and supplementary readings. Although we use few Harvard Business School cases, most of the material is developed by myself and my co-authors.

Creation of better template models of strategic planning and leadership control aided by business simulation games based on real-life case studies and analysis tools

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The business simulation games, which expose the players/managers to a broad range of learning objectives, on many occasions fail to provide a template model that can govern the desirable actions. Hence, these games are not always effectively linked to the repetitive cycles of arriving at decisions or confronting results in the long-term interest of business. The current research paper foresees an incremental improvement that can be allowed to occur during the product life-cycle of a business simulation game and how such a process can lead to an appropriate methodology with enabling framework of application and validation as a form of typology.

Introduction

To simulate real-world systems to arrive at a better planning on the drawing board is the aim of business simulation games. It is true both for scenario-based or numeric-based business simulation games. Today, a much diversified product-range of business simulation games has been conceived by Association for Business Simulation and Experiential Learning (ABSEL), Japanese Association of Simulation and Gaming (JASAG), North American Simulation and Gaming Association (NASAGA), International Simulation and Gaming Association (ISAGA), and more note worthily, European Social Simulation Association (ESSA), which runs a popular blog as a part of its special interest group on Social Simulation and Serious Games (SSSG).

The games expose someone to a broad range of learning objectives such as strategic thinking, decision making, problem solving, risk analysis, production, financial, resource and market analysis, operations, group thinking and teamwork and leadership.

Aims of the Research:

The business simulation games available in many forms of humanly controlled actions that are interrelated and have a bearing upon the stakeholders and upon the environment, but such game actions are not always effectively linked to repetitive cycles of arriving at decisions or confronting a result. Thus, the research paper foresees on an incremental improvement that can be allowed to occur as the product life-cycle progresses in a business simulation game and how such a process can lead to ways of theorising through appropriate methodology, application and validation as a form of typology.

Discourse (includes literature review)

The research sources from Tsuchiya and Tsuchiya (1999), Wolfe and Crookal (1982), Greenlaw *et al* (1962) identified difficulties to characterise the nature of business simulation gaming as a sequential decision-making exercise structure around a model of a business operation, in which participants assume the role of managing the simulated operation.

Greenlaw *et al* trace the business simulation games to an outgrowth of earlier developments in disciplines such as military war gaming, operations research, and educational role-playing.

The research aims to discover the underlying patterns in various simulated experiential environment that contains enough verisimilitude, or illusion of reality, to include real world-like responses by those participating in the exercise as Keys and Wolfe aver. The discovery of the patterns in experiential simulations can be progressed to the next level aided by Gredler's identified categories such as data management simulations, diagnostic simulations, crisis management simulations, and social-process simulations.

The endeavour is to interpret different types of symbols and classify according to types of the business simulation games and identify the underlying core approaches towards 'problem solving' of various business simulation games available on the platform of standalone desktops, game consoles, internet simulation, etc. The research aims to examine a host of educational and training games sourcing from the catalogue of ESSA:e-games, internet games, video games, simulations on policy and planning exercises and day-in-the-life, debriefing, analytic discussion, post-experience analysis, modeling, virtual reality, game theory, role-play, role-playing, active learning, experiential learning, learning from experience, augmented reality, playthings, structured exercises, education games, alternative purpose games, edutainment, digital game-based learning, immersive learning, brain games, social impact games, games for change, synthetic learning environments, synthetic task environments, etc.

It is an endearing exercise to the design, implementation, and evaluation of games and simulations to improve learning results that can be seen to aiding the business simulation games and subsequent business decision process. The objectives of business simulation games are to create effective solutions considering multiple perspectives, provide a slew of tools for effective project management, improve efficiency and reduce waste and create a better control over processes through documentation.

To measure the return on investment (ROI) on any proposed project and to have an estimate of cost and time overrun through proper assessment of various project and opportunity costs a proper product development cycle can be sourced from business simulation games.

Senge and Lannon-Kim (1991) in their discourse of managerial micro-worlds articulate how the corporate head honchos learn about their long-term, systemic consequences of their actions through business simulation games' crated virtual worlds, which enable them to think systemically if they can uncover the subtle interactions that thwart their efforts.

The current endeavour goes beyond Naylor's (1971) pioneer work of providing the contents, structure, and operating of management games where business decisions concern price, output, advertising, marketing, raw material acquisition, changes in plant capacity, and wage rate. Hence, it is a plausible idea to refer to the neo-Naylor revisionists such as Horn and Cleaves(1980), Dickinson and Faria (1995), Larsen and Lomi (1999), who build set of mathematical models establishing the connection between the operating results and operating decisions of the individual enterprises, as well as the external environment (the market and suppliers).

The is always worth to reengage with the neo-Naylor's identified basis of (a) a set of behavioural equations, for example the demand and cost functions, and a set of accounting formulas that have been embedded into the system, and (b) the individual decisions of each organisation, operating results are engendered by the system as reports of profit and loss statements, abbreviated accounts, balance sheets, cost and production reports, sales reports, etc.– at the end of each operating period.

The companies must make effort to see if the identified environment can be changed by the system administrator of the game by altering the parameters of the operating characteristics of the business simulation game and record the changes to understand the patterns of variations.

In each business simulation case, the organisations will find it incumbent upon them to respond according to the magnitude and the nature of the change imposed by the external environment, such a phenomenon can provide a better insight into reading the patterns of change. The findings can be collated in order to note points of disagreement with Naylor, in case in case such things occur, as the latter mentions that a few complicated and realistic games permit multiple products, plants, and marketing areas, stochastic production periods, stochastic demand, labour negotiations, and the sale of common stock Lainema (2003).

The business simulation games, conventionally conceived as a sub-genre of the social simulations that aim to reproduce real-life settings in order to obtain a better understanding of the social world (Gilbert & Troitzsch, 2005), can be ranged from macro to micro-scale models. In the current research it is considered to be a representative of a social system or a constituent of multiple actors.

The micro-model of business simulation games, often considered as form of agent-based models, need a particular engagement with regard to a specific context. The serious games, on the other hand, focus on imparting players/managers certain information or skills while retaining the 'fun element' in the game (Djaouti et al., 2011). These applications may need a different level of engagement as compared to the earlier ones.

As these business simulation games use metaphors to put their messages across, and not always necessarily simulate (real-life) situations but transport these simulations to fictitious realms in which the same general principles hold the control, the perceived differences between real-life simulated games and fictitious realms are created on the basis of same underlying principles.

The distinction between simulations and serious games -- the latter provide abstractions and include game mechanics to entice players and let them learn or practice – always needs to be underlined. Predictably the learning goals can evolve as the players/managers to become aware of how social situations may play out when certain actions are carried out and how certain serious games pursue to 'gamify' social simulations, such as negotiation training systems (Swartout 2010) or role-play that enable to simulate and experiment with social situations otherwise difficult to reproduce in real life, thus allowing them to study human behaviour little more intricately (van Ments 1999).

It is always a good idea to define and clarify a stream of issues emerging from business simulation games. Would it warrant action? If so, how? Does the matter call for immediate attention, or can be deferred to a future time? Can the business simulation game be chosen to be

viewed through Pareto Principle (80/20 Rule)? If so, how it could pave the way for assessing and prioritizing choices in all sorts of situations?

As many possible courses of action may emerge competing for attention in a business simulation game the subsequent upgrading of the system can be based on the problem-solver estimating of the benefit obtained by each action, then selection of a slew of the most effective actions that can deliver a total benefit reasonably close to the maximal possible one. The application of Pareto analysis in a business simulation game does enable a creative engagement of reflection on the causes of problems because it facilitates stimulate thinking and organize the thoughts accordingly.

At the initial development stage of business simulation game, the causes of problems can be limited by their exclusion of possible key problems, which may appear insignificant initially, but that threaten to acquire masses with time-consumption leading to paralyze the entire system.

The business game simulation must also consider all the sub-disciplines of business analysis known as requirements engineering focusing on ensuring the changes made to an organisation that are aligned to its strategic goals. These changes include changes to strategies, structures, policies, business rules, processes, and information systems.

As a part of sub-disciplines the organisation analysis (business simulation game needs to be modeled on this) the focus must be on apprehending the requirements of the organisation as a whole, its strategic direction, and identifying initiatives. This will allow an organisation to meet its strategic goals: building and sustaining a business architecture, undertaking feasibility studies, exploring, identifying and defining new business opportunities, configuring the business case studies, undertaking the initial risk assessment.

Better designing of business game simulation also needs to be mapped on to planning the requirements development process and requirement elicitation (focus group, brainstorming, document and interface analysis, reverse engineering, user task analysis, process mapping, job shadowing, design thinking, etc.).

If the major forms of requirements analysis and documentation can be built into the business simulation games such as architecture analysis, business process analysis, object-oriented analysis, structured analysis and data warehouse analysis, storage and databases analysis it would lead to perform correctness of a proposed solution, and support the implementation of a solution, and assess possible shortcomings in the implementation in a particular business scenario.

The documentation as a part of requirement analysis that needs to bear on a business simulation game may take multiple forms such as textual (business cases that summarize specific information), matrix (listing the table of requirements with priorities), diagrams (depicting how data flows from one structure to the other in a business scenario), wireframe (how elements are needed to populate a portal), etc.

Ethical Consideration

The business gaming system address the ethical questions such as how to prepare the managers/players to avoid the gaming system that also teaches to manipulate the system. Gaming the system allows to bend rules or to manipulate the system for a desired outcome that

is not in the larger interest of society. The vested interest in abusing the gaming system can be termed as an error is the essence of gaming the system, not at all desirable in the larger interest of the society, in which a gap in protocol invites for errant practices leading to unintended results. However, the business simulation games can create a reporting system in which the players exposed to choices of gaming the system can have the counter choices to convert them to work in the larger interest of business and society.

Evidently it is not always a good idea to rely on simulating all real-life situations for business simulation games as there can always be new revelations and perspectives as the complexities of the businesses emerge in future. The gamified simulation in the management of natural resources with relation to the behaviour of stakeholders, when faced with new fishing regulations, can always be underscored as an area of serious consideration.

Methodology

If the pursuit of proper investigation into business conditions is built into business simulation games, it would engender data enabling contextualize the problem areas and finding solution. The business simulation games must always consider different perspectives varying across business areas as each domain enforces its conditions of customers, regulators, suppliers, financials, etc.

The business simulation game can innovatively combine the above with a host of analytical tools as following:

Heptalysis (Kathleen B. Hass et al 2008): In-depth analysis of early stage businesses on a clutch of categories such as Market opportunity, Product/Service solution, Execution plan, Financials, Human Capital, Potential return, Margin of safety);

CATWOE (Ramirez, Rafael et al (eds.) 2008): Goads the thinking process leading to achievement), de Bono's Six Thinking Hats (brainstorming process to create and analyse ideas and options;

VPEC-T (Russell, Jesse and Cohn, Ronald 2012): Employed in situation when analysing the expectations of multiple stakeholders differ in their views of a system, though all believe the enforcement of such a system on a common ground of interest, but have varying priorities and responsibilities;

SCRS (www.business-analysis.co.nz/ Business Analysis (BA) in New Zealand): A bottom-down approach business analysis should percolate from the high-level business strategy to the solution, through the current state and the requirements;

MoSCoW (Weese, Susan and Wagner, Terri, 2011): Prioritize needs by allocating an appropriate priority, estimating it against the validity of the need itself and its priority against other needs;

MOST (Cadle, James et al, 2010): The project is aligned to its mission, objectives, strategies, tactics);

Failure mode and effects analysis (Stamatis, D. H., 2013)**:** Reviewing as many components, assemblies, and subsystems as possible to identify failure modes, and their causes and effects);

Fault tree analysis (Roberts et al, 1987) (a top down, deductive failure analysis model in which an undesired state of a system is analysed deploying the Boolean logic in order to combine a series of lower-level events in order to comprehend how systems can fail, to identify the optimal ways to reduce risk or to figure out the event rates of a safety accident or a particular system level (functional) failure; and

Ishikawa's fishbone diagrams (Munro, Roderick A, 2003): Useful for product design and quality defect prevention as this cause-and-effect diagrams identify potential factors causing the overall effect. Each cause or reason for imperfection, thus identified as a source of variation, enable to group the causes into major categories to identify as distinctly identified sources of variation).

Research limitations and direction for further research:

It would be huge value-addition to business simulation games to have known the technique enabling to identify the 'lead or top portion causes' that call forth to be addressed to resolve the majority of problems in a business scenario. The preponderance of these 'top portion causes' once identified in the business simulation games, the analysis tools such as Ishikawa diagram or Fish-bone Analysis can be used to identify the root causes of the problems.

The Pareto's "80/20" rule, under the assumption that, in all business situations some 20 percent of causes determine 80 percent of problems, employs this ratio as a rule of thumb. However, this is not nor should it be considered immutable law of nature, but certainly this can have a bearing the way business simulation games segregate its 'causes' and 'effects' and the ways the analysis can be linked to risk management allowing companies to focus on those risks that have the most devastating impact on their project.

The business simulation games must aim to enhance the development and application of business simulations and experiential methodologies, encourage a wider use of simulations and experiential methodologies, particularly with regard to effective business education, augment techniques used for the assessment of education and the development of learning theory and to facilitate communication on a global scale among specialists designing and using business simulations and experiential methodologies.

However, it is extremely difficult to imagine a world where in which each player is assumed to know the equilibrium strategies of the other players, and no player has anything to gain by changing only their own strategy, as Nash equilibrium (Shapley, Lloyd S. and Yao, Shuntian, 1996) provides solution concept of a non-cooperative game involving two or more players. If each player has chosen a strategy and no player can benefit by changing strategies while the other players keep their unchanged, then the current set of strategy choices and the corresponding payoffs constitutes a Nash equilibrium.

Conclusion

An ideal business game simulation must consider involving strategy analysis of the internal capabilities of an organisation and how the business can respond to any real/perceived changes in the external environment. The result of the internal and external environmental analysis needs to be sourced heavily from the real-life examples, aggregated and effectively

summarized, and appropriately consolidated to analyse the business situation that the enterprise confronts and subsequently decides possible courses of action.

To investigate the business conditions, which must be a pursuit of a business simulation game, the input information into the simulation game must be set out to source from a choice of organisations that effectively deliberated on addressing their issues, problems, or gaps using methods such as activity sampling, document analysis, business logs, etc.

Finally, it can be concluded that the business simulation games merely based on real-life examples put a limitation on such an undertaking, hence, the developers of the game must anticipate the future or the way product life-cycle would evolve in near future, thus here forth must incorporate these cases into business simulation games.

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