Research Paper

Interdisciplinary Application: Motivational Education Model in a Post-COVID World of Digitalization

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- That the topic or parts of it are not already the object of any work or examination of another course unless this has been explicitly agreed on with the faculty member in advance;
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First of all, I want to say that we are living in such an amazing age where convenience and accessibility is at our fingertips, and on the Internet where mountains of long lost knowledge are available for free. For that, I cannot express my gratitude enough.

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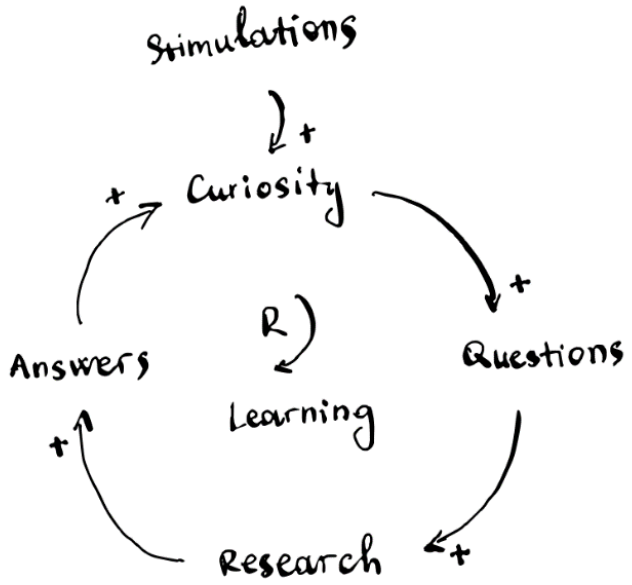

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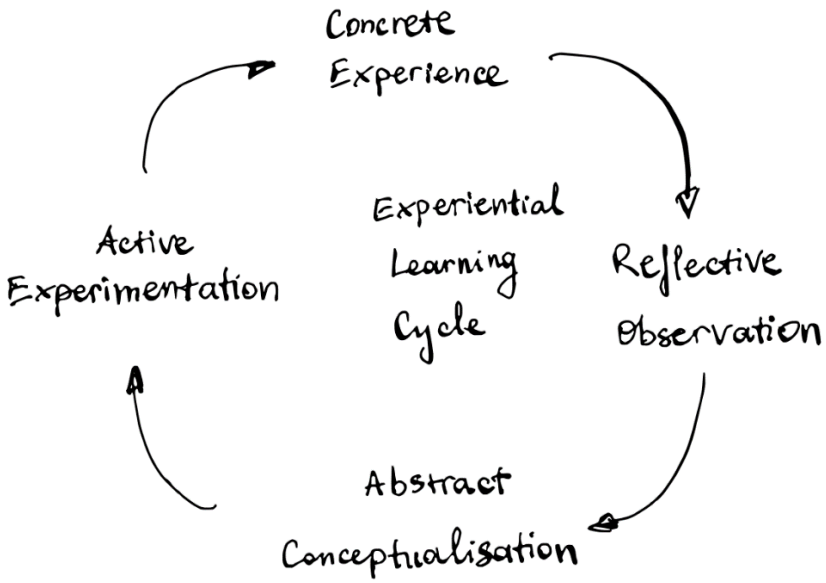

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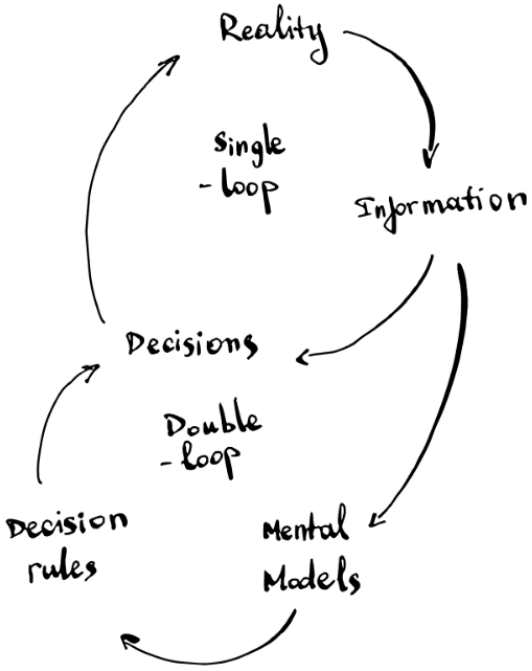

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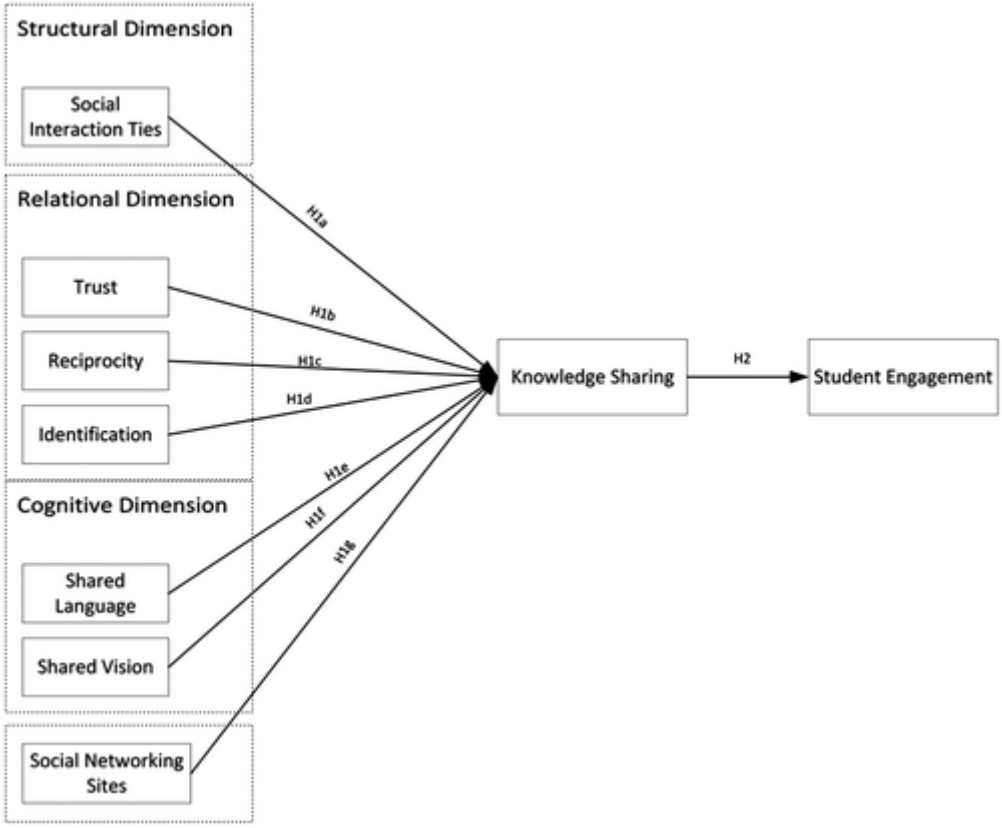

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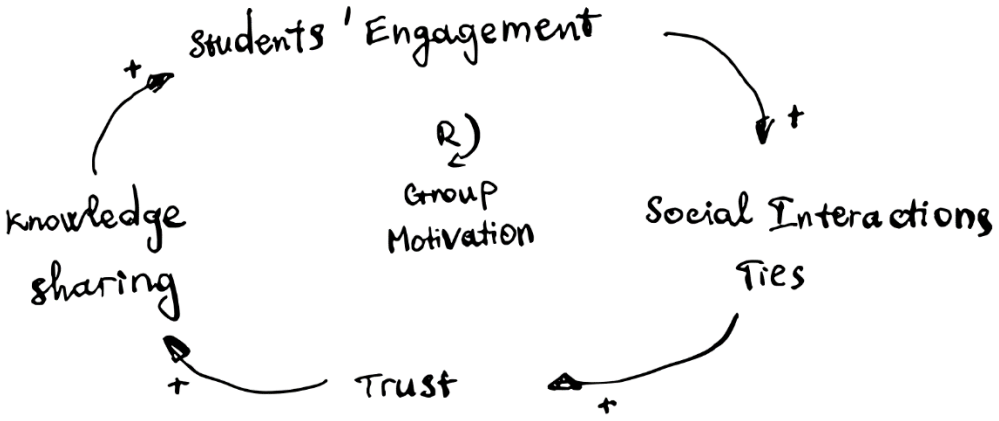

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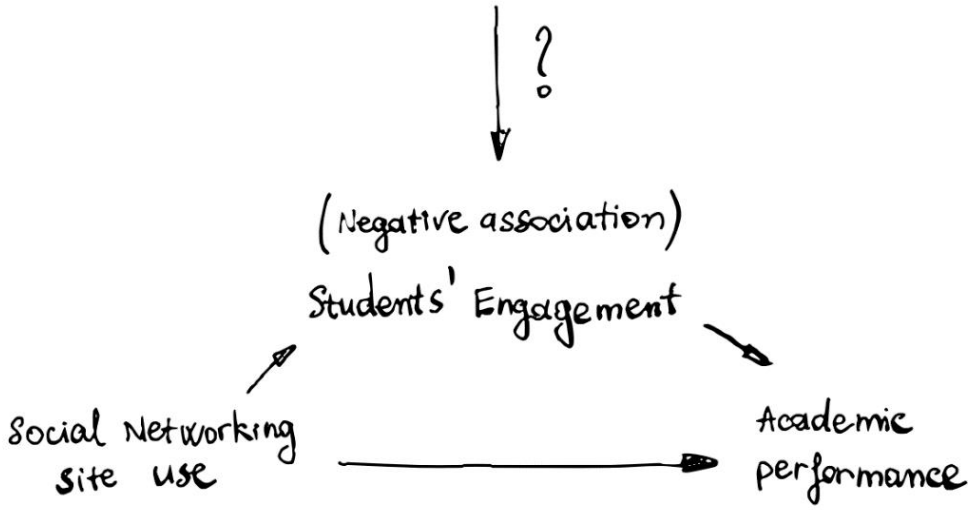

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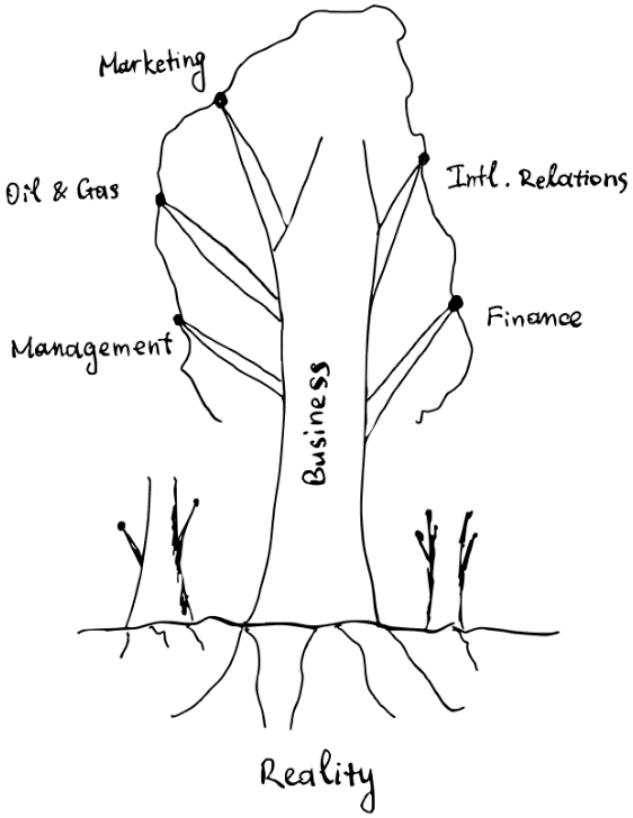

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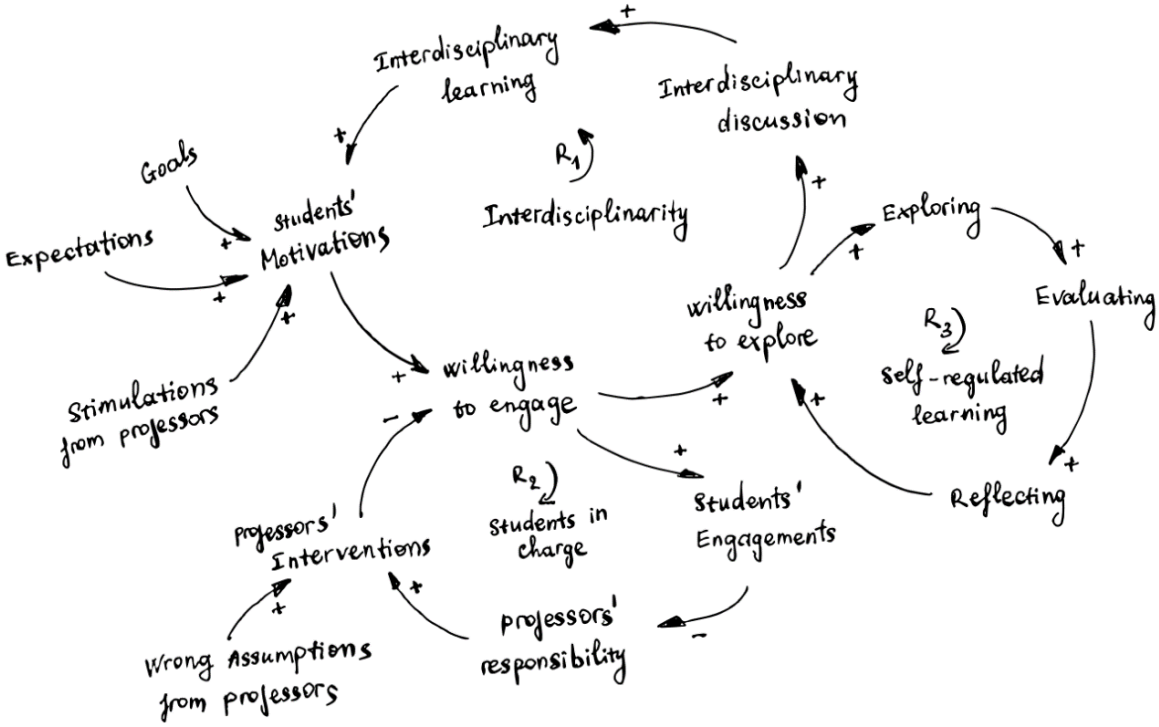

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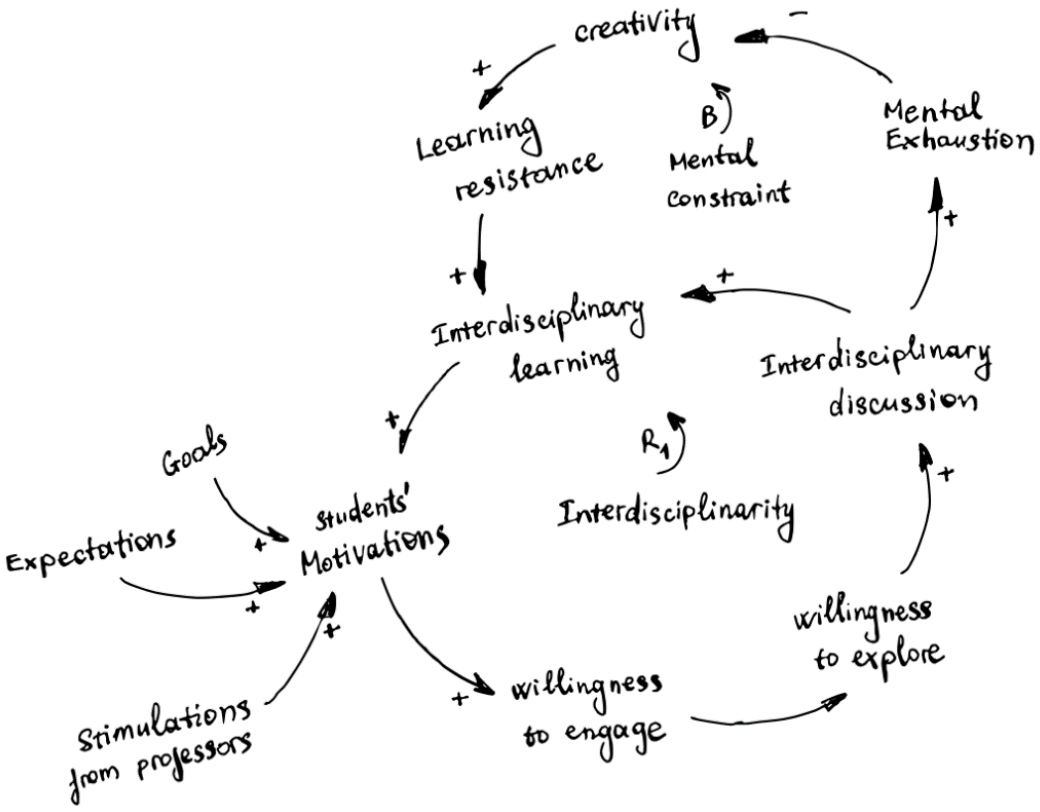

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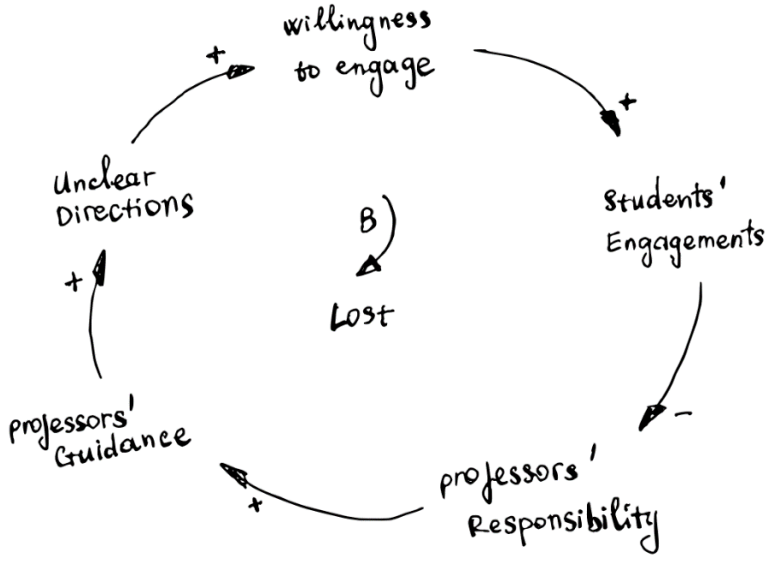

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Abstract

Author's Motivation

As a Finance student learning and interacting with other students from different majors, a common question I come across is "why do I need to take this class?" If you bring that question to an academic advisor, chances are they don't even know the answer to it, and that was what happened during my Bachelor years. At school, we are taught to follow a specific discipline; Mathematics, Arts, or Literature in Highschool, Finance, Marketing, Human Resources, or Management in College. The higher education we get, the more specific the disciplines become. Unfortunately, an observable symptom is that the more specific disciplines become, the more fragmented and disconnected they are from one another.

Literature Influences

In fact, having reviewed literatures between Late-20th and 21st century, it was concerned and proven that the more education evolved, the more detached Universities became from reality. In an online survey involving more than one hundred students around the world, more than 80% expressed that they were self-motivated toward interdisciplinary learning; however, a majority of those students need an adequate learning environment that enables and motivates them to do so. In fact, having reviewed two empirical studies with regards to student engagement and academic performance, I found both studies fail to identify and emphasize the underlying factor of students' motivation.

Focuses of Study

In this study, we first pursue the idea of motivational education to define "adequate" learning environments. Next, we will explore the connections between motivation and interdisciplinarity. Last but not least, after drawing from my own and other students' experiences at Geneva Business School, I came up with a framework for these dimensions of education. Subsequently, this framework is used to challenge the current educational practices, and to propose future applications for online as well as hybrid educational models.

Research Methods

The research methods employed in this study will primarily be in-depth interviews in the form of contextual inquiries, online survey, and a physical experimentation designed with specific contexts.

Keywords: Research, education model, design, interdisciplinary education, motivation, Post-COVID, online learning.

1. Introduction

A little bit about myself, I am Master student of Science in Finance at Geneva Business School (GBS). My esteemed readers and educators, that single sentence must have got you wondering "why in the world is a Finance student writing about the education system?" Before I answer, a better question you can think about is "why not?"

To me, learning is something very fundamental. It is a bridge that connects who I become, or will become, to who I meant to be. There is a very powerful quote by Peter Senge in his book *"The Fifth Discipline"* (2006) as follow:

> *"Real learning gets to the heart of what it means to be human. Through learning we re-create ourselves. Through learning we become able to do something we never were able to do. Through learning we reperceive the world and our relationship to it. Through learning we extend our capacity to create, to be part of the generative process of life. There is within each of us a deep hunger for this type of learning (p.14)"*

Through my learning, I became aware of the struggles of students within the current education system by paying attention to little and abstract details and patterns from the classroom models. These details gave rise to the idea and initiatives of this thesis, evoking a different lens that challenges the current system, bringing forth a new model that shifts educators' mental models (see appendix A1) and enhances classroom learning outcomes.

There is an age old quote by Anne Isabella Thackeray Ritchie, an English writer in the late 19th century, in her novel "*Mrs. Dymond"* (1886) that goes:

> *"[…] if you give a man a fish he is hungry again in an hour. If you teach him to catch a fish you do him a good turn (p.342)"*

If you feed someone, that person will depend on you for the supplies; but if you teach him how to feed himself, he will, ideally, learn how to take care of himself and thrive on it. That is the core of sustainability. Learning works the same way. Instead of feeding students with topics presented on PowerPoint slides and, in the process, make a chore and boredom out of it, educators should strive to provide students with ideas and questions that evoke their curiosity, encouraging and motivating them to go and seek the answers by themselves. Dr. Russell L. Ackoff, an amazing systems thinker and educator in my opinion, said this in his speech:

> *"The principal purpose of an institution of higher learning ought to have two prongs to it. First, to enable students to learn how to learn; and secondly, to motivate them to want to do so. You see 50% of what you learnt in the University is irrelevant to what you're going to do later […] and the other 50% will be obsolete within a couple of years (Awal, 2015)."*

At GBS, there is a common pattern that Business electives choices outnumber the major courses, leading to a Finance major student having to enroll in Management, Marketing, or Communication courses and vice versa. This could and should have been a great opportunity for students to connect and put together what they had learnt in their respective major courses to create a holistic view of businesses. Unfortunately, what happened in reality is often discouraging. In fact, instead of using elective subjects as bridges to connect different aspects of reality, these courses are designed in a way that is disconnected from one another. As a result, students often find themselves trapped within the scope of the class without being able to connect what they are learning to what they would like to learn. If anything, it actually reduces the students' learning outcomes by demotivating them (CEP, 2012).

Most professors may argue that the students' reviews, ratings, or evaluations are very high at the end of the course. That would bring us back to the question which I assume all of us, at some point, have come across: "do the results justify the means?"

One of the greatest privileges of being students is that students open up to each other as they go through the same experiences at the University. This allows interpersonal conversations outside the boundary of a classroom and the influence of faculties, giving truthful and honest insights into how they perceive their experiences. To develop an understanding of the "means", throughout my time at the University, I have been keeping close conversations and exchanges with numerous students from all over majors about their experiences and personal values when it comes to the education they received. With the data I gathered, I took it on myself to experience those classroom models both objectively and subjectively, meaning I would attend the classroom sessions, observe the interactions, and design further contextual inquiries on students' behaviors and performance tendencies. That was how I gathered my data.

The current education system fails at one critical aspect, and that is interdisciplinarity, the failure to visualize and express the connections between disciplines which represent a holistic view of reality. For Master students, most, if not all, of them either had working experiences in prior to enrollment or are currently working, meaning they have a sense and an understanding of how reality works. Classrooms, on the other hand, are just models that are designed to represent the reality. If the designs are inadequate, it will have counterintuitive consequences on the students' learning capabilities as well as their enjoyment in exploring the connections with reality (Bear and Skorton, 2019).

After all that has been said, it comes down to the big question, "What do we do about it?" The lack of interdisciplinarity is surprisingly not something new. In fact, in the recent years, there have been research and experiment projects addressing this issue in countries around Europe and America (Cvijovic et. al., 2016; Santos et. al., 2017; Bear et. al., 2019; Santaolalla et. al., 2020). Unfortunately, my suspect and assumption is that it is not quite widely known

and discussed due to the fact that throughout my 24 years of learning – mostly in Vietnam, 4 years in the U.S., 1 month in Australia, and 2 years in Switzerland – I have not once heard of the concept of “interdisciplinary education”.

Throughout my learning, one thing that I vividly remember and have taken to heart is that students’ motivations, most of the time, dictate their own learning outcomes. This statement has also been discussed and proven by other educational research as well (Chang et. al., 2012; CEP, 2012; Awal, 2015; Bergendahl et. al., 2015). In the age of digitalization, students’ responsibility toward learning is the success factor for any online education models; but how educators can facilitate such awareness and encourage such responsibility is a never-ending question in such dynamic environments of classrooms. Thus, by exploring the global views and practices in educations by students and professionals, this paper hopes to contribute to this discussion for a better future education environment.

2. Literature Review

In this section, I would like to introduce a number of ideas and insights in the forms of speeches, research journals, books, articles, … that would help the audience understand and appreciate the forms and reasonings of the designs and experimentations presented in the next section.

System and Systems Thinking

The first thing I want to write about is the concept of "system" and "systems thinking". Dr. Russell L. Ackoff mentioned this in his speech:

> *"A system is a whole that contains two or more parts, each of which can affect the properties or the behavior of the whole. […] The second requirement of the parts of a system is that none of them has an independent effect on the whole. How any part affects the whole depends on what other parts are doing. […] They are all interconnected. […] And finally, if you group two parts of a system in the sub-groups, no matter how you sub-group them, each sub-group will have an effect on the properties and the behavior of the whole and none will have an independent effect. […] a simple statement, a system is a whole that cannot be divided into independent parts (Awal, 2015)."*

This is important because whenever the word "system" is mentioned in this paper, this is the kind of system being referred to, a whole with multiple elements embedded inside. What can we do with this? Let us look at a course as an example. A course is system – or a sub-system within a larger system known as Geneva Business School – inside which has the professor, the students as the core elements[1]. Another crucial factor of a system that Dr. Ackoff did not mention is the system's purpose. What is the purpose of a course? Just like "beauty is in the eye of the beholder[2] (Hungerford, 1878)," there are absolutely no definite answers to this question. Thus, the concept of "purpose" in this paper will be simplified by assumptions.

To build on this, "systems thinking" refers to the way of thinking in terms of a whole including its overall structure and patterns of behavior. With that said, we do not just look at what the professors, or the students, are doing, we need to look at both sides simultaneously. Moreover, one class is only one system; within a bigger system like GBS, each class becomes a sub-system that may interact and have an effect on one another as well as the whole.

Here is a story, during Spring 2020 semester, mid-June, I was taking seven Finance-focused courses with several other students from Finance and Management majors. There was a financial formula which, apparently, was so

[1] It is also helpful to note that each student on its own is one part of the system.
[2] Quoted from "Molly Bawn" (1878) by Margaret W. Hungerford.

popular that four out of seven courses decided to teach it; it was the Weighted Average Cost of Capital (WACC) formula. Despite being in different classes, the way the formula was presented was absolutely similar, which was to look at the formula and plug in the numbers. From a student's point of view, I sure asked myself, "why are we duplicating our efforts like this?" I talked with my peers and found some of them just gave in and went with the flows. I paid special attention to them because this type of students is very likely to have a very low motivation level.

Learning from Motivations and Motivations to Learn

In his book, "The Fifth Discipline" (2006), Peter Senge wrote:

> *"Reality is made up of circles but we see straight lines. Herein lie the beginnings of our limitations as systems thinkers (p.58)."*

> *"In systems thinking, it [feedback] is an axiom that every influence is both cause and effect. Nothing is ever influenced in just one direction (p.60)."*

By circles, Senge meant the concept of causality. In system dynamics, everything is interrelated and interconnected to one another, they influence, and therefore are influenced by one another. Thus, we can look at systems in the form of loops of "feedback". To demonstrate, I created a simple diagram of a loop named "Motivation" as follow:

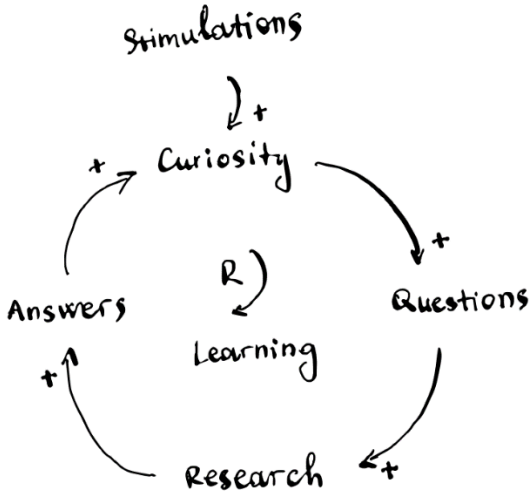

Figure 1: Simplified 'Learning' feedback loop

If we refer back to Senge's quote in the Introduction, each of us has a deep hunger for the type of learning that moves and inspires us, almost like a part of basic human needs. I call this variable curiosity (1). When we are curious about something, we come up with questions that require researching (2). With that need, we are then more motivated to do the research to find the answer and to

expand our knowledge base (3). As our knowledge base expands, we come up with more questions to accommodate what we have learnt; from here the cycle continues. We call this a reinforcing feedback loop (R) because it doesn't end, and each variable has a positive link to one another[3]. In my opinion, this is the core of learning, a natural never-ending and self-generative process fueled by motivations that resonate with personal values, interests, and beliefs. I call it 'learning from motivations.'

On the other hand, to trigger curiosity, there is often a need for stimulations coming from outside of the loop. In the diagram above, these stimulations are presented as an influencing-only variable. In this model, this should be the task for educators, and I believe it is critical to distinguish between control and facilitate. By facilitate, I mean professors should play the role of a middle-man who connects students with the materials which they deem necessary and important enough for the students to know. Not just about taking control of the class, a facilitator injects doses of stimulations in the forms of questions, materials, etc … to provoke the students' curiosity. I believe this is one way to create the fire [curiosity] that is going to be all-consuming.

As an example, there is a powerful story that Dr. Ackoff shared, about a self-development project done in an all-black community in Virginia, America, where 80% of Highschool-graduated students cannot read. The team conducted research and found out that it was not because those kids could not learn how to read, but rather because they didn't want to. Thus, they came up with the idea to put up a complete set of Charlie Chaplin silent films in the auditorium of the neighborhood schools and play them for the entire school day, allowing any child to come and sit and watch without any excuses from their teachers. By the end of the semester, every kid in the schools could read due to the fact that they wanted to read the subtitles, and so they learnt without being taught. "Education has to focus on motivation, what excites people," concluded by Dr. Ackoff (Awal, 2015).

Fragmented Education Structure

My assumption is that students can't enjoy, at least not to the fullest, learning without being able to connect what they learn to what they want to learn, which drastically influences students' capability to remember and retain the subjects outside the classroom. What does it mean exactly to be fragmented? Santos et. al. (2017) wrote this in their paper:

> *"In an attempt to make students learn, teachers give importance to the content itself and not to its relation with the situation from which it emerges,*

[3] These links represent causal relationships, and they should not be confused with correlations. For more details on causal feedback loops diagram, see "Business Dynamics: Systems Thinking and Modeling for a Complex World" (2000) by John D. Sterman, Chapter 5: Causal Loop Diagrams (p.137).

generating the classic dissociation between theory and practice: what is learnt does not correspond to the reality (p. 72)."

To couple on this, Dr. Ackoff mentioned:

"[…] the essential properties of any system derived out of how its parts interact, not on how they act taken separately. […] and therefore, when the whole is dissembled, it loses its essential properties and so do all of its parts (Awal, 2015)."

Last but not least, John D. Sterman explicitly wrote in his paper, "All Models are Wrong: Reflections on Becoming a Systems Scientist" (2002):

"[…] a model is a simplification, an abstraction, a selection, because our models are inevitably incomplete, incorrect – wrong (p.525)."

To put the three together, I would dare say what we are teaching at schools are essentially wrong, because we don't teach reality, we only teach fragments of reality. Nevertheless, they can be useful, and what make them useful are the ways we teach. In his book, "Managers not MBAs: A Hard Look at the Soft Practice of Managing and Management Development" (2004), Henry Mintzberg wrote:

"[…] The danger of breaking things apart … is that it may not be possible to put them back together. Business schools have not been able to put things back together again because that has to happen in context – in specific situations (p.36)."

If we refer back to the WACC story above, the first thing professors did was to take the formula out of context. Despite being in four different classes, the formula along with its components were taught in the same way, being presented on a PowerPoint slide accompanied by exercises for students to practice. This method addresses two things, the "what" and the "how". However, the most important one, in my opinion, is left untouched, which is the "why". It has never occurred to us students, and possibly the professors as well, that the formula itself is questionable, because we are taught with such convictions that there is always an absolute answer – quizzes, exercises, exams whose answers are predetermined and expected in certain ways – which is absolutely not true (Awal, 2015).

In July 2020, I had a conversation with a group of five classmates over lunch where I found out they were confused about the reason of doing calculating exercises such as WACC, because most financial tools nowadays provide clients with detail calculations and analysis of WACC and many other financial ratios. One student in Management field particularly dropped a sentence, "I will just hire a financial person to do this for me." Even though there is a finance aspect in the managerial studies, this student failed to see the connection between finance and management, and there were no reasons for him/her to

explore it. Why? Because the course was set up in a way that would not let him/her see the probability that the connection exists.

As for the "what" and "how", students could have learnt the formula and how to use it on their own without the professors making it an assignment and turning it into a chore. As a matter of fact, I estimated around 85%, if not more, of my classmates who do not remember the WACC formula, and they openly admit using Excel templates, or look up Google, such Investopedia, every time doing the calculation for assignments or homework. Nevertheless, to motivate students to want to do so on their own requires a different approach rather than just handing out assignments and homework. If we can do that, not only we can reduce the professors' effort but also engage students' individuality.

Interdisciplinarity in Global Educational Practices … or Was It?

In developing countries such as India, Gautam et. al., in their study about "Education System in Modern India" (2016), traced the Indian Higher Education back to its root starting with the Scientific approach advocated by the country's first Prime Minister who stated:

> *"Search, inquiry and applying your mind to it … and search by experience and reasoning … It is a way of training the mind to look at life and the whole social structure (p. 4876)."*

The view on Indian education started out with such a novel idea of promoting the application of holistic and interdisciplinary approach to reality by questioning a person's beliefs and values. However, as time passed, in 2016 by the time the study was conducted, massive funds and efforts have been cut and diverted from such education system, slowly but surely deteriorating it. By the end of 2019, a statistic report in India shows an increasing number of children not attending elementary to high, and a staggeringly low number of high education graduates (Gupta, 2019).

What happened exactly? In the same study, Gautam et. al. mentioned there was increasing merit requirements from public Universities as well as Economic and Social needs and influences whose forces drive students to give up on their personal beliefs, values, and dreams. In turn, these factors greatly diminished any intrinsic motivations for learning from these students, leading them to be poorly developed and underperformed in education and employment (Gautam, 2016: p.4878). This created a downward spiral where the education system went from bad to worse.

On the other hand, I also look at developed countries like the United Kingdom and the United States of America. I found books and Journals from the late twentieth century reveal that the concept of interdisciplinarity was one of the most prominent concerns in the more developed countries as early as 1970s in both the United Kingdom and the United States of America (Squires,

1992: p.201; Kockelmans, 1979). At the same time, there was also increasing evidence that the more education evolved, the less attention people paid to, and even seemed to reject and avoid, interdisciplinarity. Carl R. Hausman even went as far as suggesting that experts who exerted themselves with intense focus on and pursuit of one single field of study often ignore and forget the constrains and limited boundaries of their own field (Kockelmans, 1979: p.3).

In their work, “Practising Interdisciplinarity” (2000), Peter Weingart and Nico Stehr discovered that by the beginner of the twenty-first century, interdisciplinarity has lost its essential meaning despite the fact that this term was over-abused in funding programs and education reforms in America; and it was used as description in organizations and educational institutions whose structures were defined by separated departments and faculties (p. 25-27). This is the very same structure we can find in almost any schools or educational institutions in any parts of the world today, and that is two decades later, in 2020-2021 – the department of Finance, of Marketing, of Human Resources, of Management etc …

In a report issues in Science and Technology done by Ashley Bear and David Skorton, titled “The World Needs Students with Interdisciplinary Education” (2019), I found more concrete evidence that graduate students in the America suffered from taking fragmented and seemingly disconnected courses whose disciplines are deemed irrelevant to their declared major. These sufferings are defined using not just external but also internal factors; external in a sense that students being questioned by employers about their programs’ relevance, and internal in a sense that these students don’t even know why they need to take certain courses.

In another study done by Karseth and Solbrekke, titled “Curriculum Trends in European Higher Education: The Pursuit of the Humboldtian University Ideas” (2016), which examined the European curriculum layouts in University to identify the applications of interdisciplinarity in higher education. As it turned out, the processes of curriculum making were heavily influenced by policy makers whose goals completely contradicted the view of interdisciplinarity. It is also mentioned that said curriculums had negative consequences on the functions of educational staffs, as well as learning outcomes for the students.

Different Learning Environments

Despite the assumably negative movements of educational practices pointed out above, some study fields have been showing positive results for learning and application outcomes; these fields require hands-on experiences and systematic approaches in both learning and applying processes.

One prime example is the medical field, especially in surgery. In 2013, Seymour et. al. contributed to a journal dedicated to surgical practices using their experiences from American College of Surgeons-Accredited Education

Institutes, they called it “Best Practices in Interprofessional Education and Training in Surgery” (2013). The study presented five perspectives on interprofessional education around which trainings were designed. Among these five, two of them focused on simulation-based activities, two others focused on interdisciplinary aspects of having interprofessional collaboration, and the last perspective was to incorporate both interdisciplinarity and simulation-based trainings. As they concluded, this model subsequently created a new level of standards in surgical practices and training to accommodate the ever-expanding ranges of knowledges, greater knowledges, and expertise.

Two years later, in 2015, Gardner et. al. researched and recorded in the same journal at the same Institute, titled “Best Practices Across Surgical Specialties Relating to Simulation-based Training” (2015). The study proposed a training program with the participation from four different fields of surgery; and subsequently, came to the same conclusion as Seymour et. al. (2013). One thing we can see clearly here is that in an effort of specialization devoted only to surgery, they did not segregate surgery from other related fields. As a matter of facts, surgeons in trainings are required to go through lab trainings where they practice on animals with thorough understanding of the human body; this educational movement embeds in the practitioners the practice of systems thinking.

Furthermore, another important aspect we ought to consider is the learning environment employed by the educators. David A. Kolb, in his book “Experiential Learning: Experience as the Source of Learning and Development” (1984), suggested four types of learning environments through the experiential learning cycle (p.33-44):

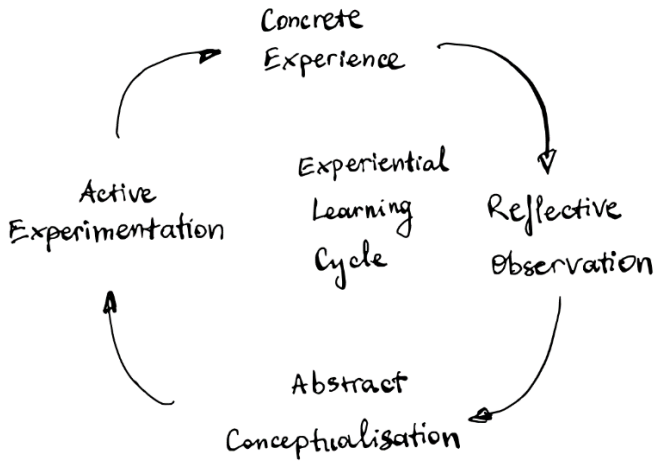

Figure 2: Kolb’s experiential learning cycle (Kolb 1984: p.33)

1. Diverging = Concrete Experience (feel) + Reflective Observation (watch)
2. Assimilating = Reflective Observation (watch) + Abstract Conceptualisation (think)

3. Converging = Abstract Conceptualisation (think) + Active Experimentation (do)
4. Accommodating = Active Experimentation (do) + Concrete Experience (feel)

Additional studies and observations suggest that students find themselves comfortable with different, or a mix of, learning environments. However, not all classroom models are designed in a way that accommodates the diversity of learning styles.

In the case of India, Assimilating is the dominant one where observations and theories crafting are most encouraged, and application is treated as secondary concerns. As a result, University graduates, including the highest achievers, found themselves unable to meet the job market standards (Gautam, 2016: p.4878-4879).

In 2011, Mughal et. al. contributed a research work to the International Journal of Learning & Development, titled "Experiential Learning from a Constructivist Perspective: Reconceptualizing the Kolbian Cycle" (2011), in which he mentioned two types of learning environments (p.28):

1. Learning occurs when students directly participate in events which are parts of their lives. Essentially, this statement is the embodiment of the theoretic Kolb's cycle.
2. Learning occurs when students are 'encouraged' to "acquire and apply knowledge, skills, and feelings in an immediate and relevant settings." However, the definition and methods of 'encouragement' remained unclear.

In 1999, Alexander W. Astin published a work called "Student Involvement: A Developmental Theory for Higher Education" in which the term "involve" can be defined and associated with all four learning activities in the Kolb's cycle – the Feel, Watch, Think, and Do. This is considered the optimal environment that enables the highest learning possible (p.518-522).

Additionally, refer to the report by Bear and Skorton in 2019, in their experiment to improve interdisciplinarity in students' learning, they design multiple courses with each course combines at least three different Kolbian learning environments; and the result as reported was tremendously positive.

The Shift of Time and Mindset

In May-June 1991 issue of Harvard Business Review, titling "Teaching Smart People How to Learn", Chris Argyris wrote:

> *"[…] most people define learning too narrowly as mere "problem solving," so they focus on identifying and correcting errors in the external environment.*

Solving problems is important. But if learning is to persist, managers and employees must also look inward. They need to reflect critically on their own behavior, identify the ways they often inadvertently contribute to the organization's problems, and then change how they act. In particular, they must learn how the very way they go about defining and solving problems can be a source of problems in its own right."

This insight laid the foundation of what later would be described as 'single-loop' vs. 'double-loop' learning by John D. Sterman in his work, "Learning in and about Complex Systems" (1994). Sterman wrote:

"Information feedback about the real world is not the only input to our decisions. Decisions are the result of applying a decision rule or policy to information about the world as we perceive it. The policies are themselves conditioned by constitutional structures, organizational strategies, and cultural norms. These, in turn, are governed by our mental models (p. 16)."

"[…] single-loop learning, a process whereby we learn to reach our current goals in the context of our existing mental models (p.16)."

Something I have experienced and internalized over the year of learning about system dynamics is that double-loop learning happens only when we have a shift of mind. I replicated the double-loop learning diagram below based on Argyris' and Sterman's idea.

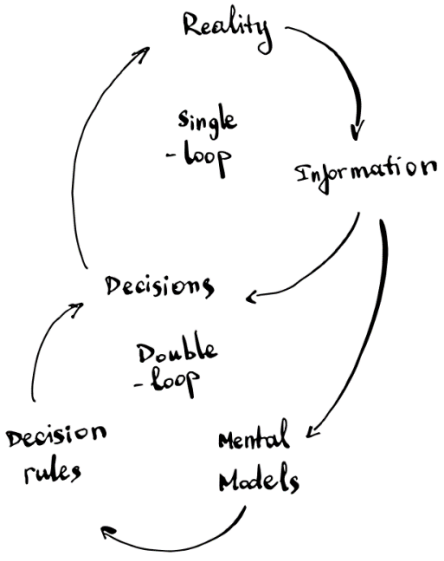

Figure 3: Single-loop vs. Double-loop Learning

What happens here is that when reality provides us with information, we make decisions in response to it, these decisions then affect the reality which we see, creating even more information. This is a classic single-loop learning. On the other hand, we have a double-loop learning where information from the real world doesn't affect our decision making directly, but rather *the way* we

think and perceive the world – Why do we do the way we do? Why do we think the way we think? – which then changes the way we make decisions.

According to Santaolalla et. al. (2020) in their research project to enhance teacher trainings, they mentioned that it is a challenge for both teachers and teacher educators to apply and implement an interdisciplinary approach, and this is especially true when the education systems compartmentalize the school curriculum into disconnected subjects (p.17). One factor that the authors mistakenly and accidentally overlooked was that these teachers after training viewed interdisciplinarity as a topic to be taught rather than a skill, or a process, that can be developed and guided over time.

Not only that, while we are still struggling with the application of old knowledge, a new age has already been upon us. With the spread of COVID-19 pandemic, educational institutions around the world are being forced to close, giving ways to increasing transitions to online platforms and digitalization for education.

According to statistical reports, online education is not a new idea. By 2010, numbers of American pursing online education had been growing at a much faster rate than total enrollments into higher educational institutions (Drake, Drake, & Ewing, 2010). In 2012, online learning was indicated as a critical element to strategic long-term learning; and out of 20.6 million students who enrolled in higher education, 6.7 million were pursing an online degree (Allen & Seaman, 2013).

Nevertheless, being old does not mean the full-scale transitions would be easy. Considering the case of India, Joshi et. al., in their study “Impact of Coronavirus Pandemic on the Indian Education Sector: Perspective of Teachers on Online Teaching and Assessments” (2020), pointed out that it is extremely difficult to adapt with the shift in environment and mindsets. For one thing, India lacks the technological infrastructures to provide students and teachers with tools – such as Internet, laptops, etc … – that allow a smooth transition. Not to mention, teachers do not have the skills, or the interests and awareness, necessary to conduct online classes, leading them to actually resist the idea and produce counterintuitive results. Overall, their experiences were exhausting and demotivating.

Not just in India, in an international journal related to modern education published in 2016, Dr. Aithal listed out some constraints and disadvantages of an online education model in which there was: “students have to be responsible for their own learning (p.230).” In my opinion, this is not just a concern for online learning, it is a concern for any types and any environments of learning.

Empirical Evidence Between Online Tools and Students' Engagements

In 2018, Koranteng et. al. proposed "An Empirical Study of the Relationship Between Social Networking Sites and Students' Engagements in Higher Education" which separated, hypothesized and investigated two prongs of the matter:

1. The relationship between online social networking sites and knowledge sharing; and
2. How the intensity of knowledge sharing affect students' engagement

With a rather large sample size of nearly 600 students, the study was concluded with, to my surprises, both hypotheses rejected, saying that students did not perceive social networking sites as an effective tool for learning, and there was no relationship between knowledge sharing and engagement. A weak point of the study reflected by the authors was the definition of "social networking sites" and thus, they suggested that a narrowed investigation on one specific site can produce different results.

After a deeper examination of the research model proposed by Koranteng et. al. (2018), I found some fascinating explanations for why these hypotheses were rejected, and the reasons were more fundamental than you would think. First of all, we will have a look at the research model.

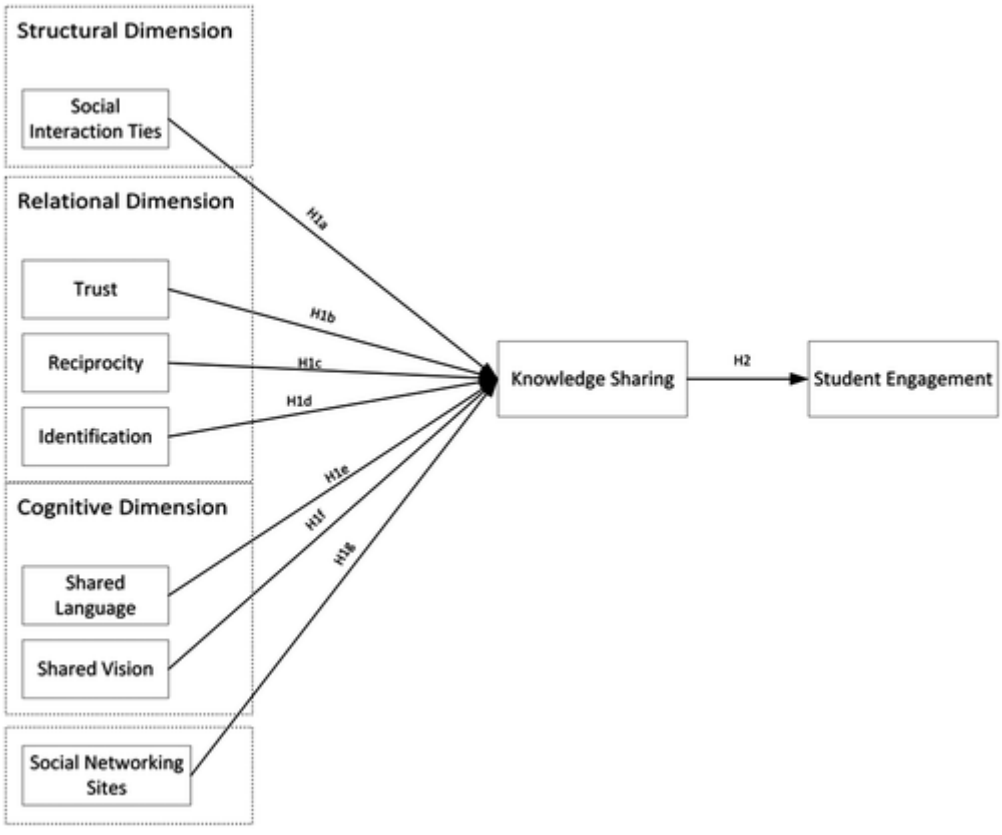

Figure 4: Research model adopted by Koranteng et. al. (2018)

For one thing, this model heavily reflected the linear thinking which Senge (2006) warned us about. From this model, there is one thing that the authors failed to account for, and that is the interconnectedness of each of the elements presented. For example, one feedback loop we can think about is Students' Engagement will have an effect on Social Interaction Ties, which then affect the level of Trust between students. In turns, the level of Trust affects the willingness to share knowledge, leading to an increase in Student's Engagement (Figure 5).

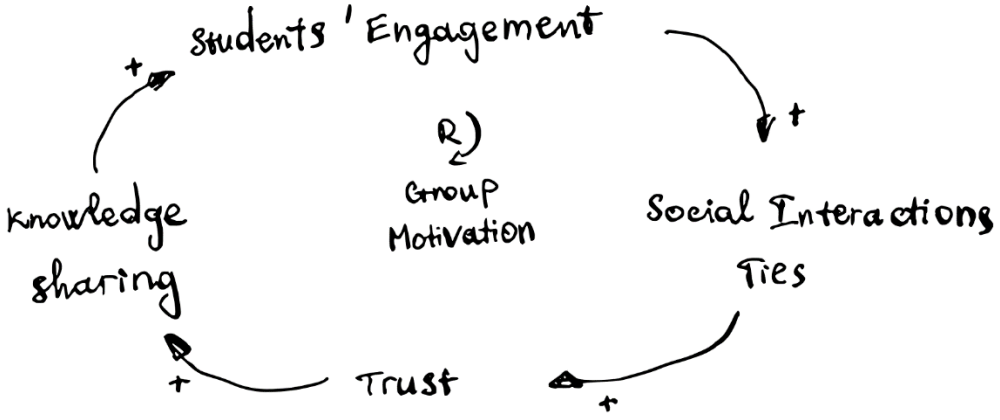

Figure 5: Reinforcing feedback loop of Group Motivation for learning

Imagine if we can have one loop out of four variables, with nine different variables from at least four dimensions, the possibilities are literally endless. Unfortunately, and secondly, the failure to identify feedback loops subsequently led to the authors' failures to see connections and knock-on effects between seemingly distant variables. As a matter of fact, the underlying assumptions were made based on an inadequate view of systems dynamics, those which they saw were only direct relationships.

In one of the more recent studies by Wondwesen Tafesse, titled "The Effect of Social Networking Site Use on College Students' Academic Performance: The Mediating Role of Student Engagement" (2020), the author pointed out that there had been many studies over the years around the topics of social networking sites and academic learning, and criticized them for their main focuses on the direct relationships between the two. Tafesse then introduced his empirical study with which he concluded that Students' Engagement can be the mediator that turn the usages of social networking site into positive influences for academic performance.

To my experiences, in Early- to Mid- 2020, I was part of the Systems Thinking and Advanced Systems Thinking online training courses. For these courses, we were using a social networking site called "Edmodo" on which we received notifications of tasks, updates, etc …; and it is also the main location for participants' interactions – and there were nine of us. Throughout the entire duration of these courses – roughly more than six months – there would only be six posts, and less than five comments from the participants. Despite this

lack of online interactions, the observable in-class engagement level actually increased a lot by the end of the courses.

What happened there was that despite the lack of engagement in online materials, participants still read and went through the posts, then they internalized it and brought the discussion to class. In turns, these discussions created a positive feedback to the group as a whole. Thus, there were indirect psychological effects that took place and reinforced the learning process. Such effects are often overlooked in the modeling process. Reflecting on Tafesse's conclusion, one fundamental aspect we still ought to consider; and that is what affects the Students' Engagement variable so that it can be the connecting bridge in a bigger system (Figure 6).

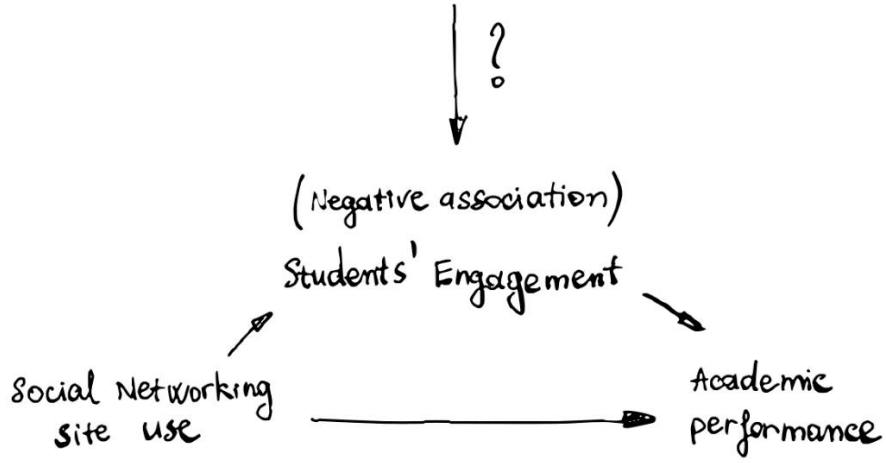

Figure 6: Fundamental challenge to Tafesse's empirical conclusion (2020)

Hypotheses Formulation

Following the literature reviews and analyzing the empirical studies, I assume the view of Dr. Ackoff that education has to resolves around motivation; supposedly speaking, if the fundamental source of Tafesse's empirical study comes from motivation, how can we encourage that motivation to be the driving factor? With consideration of the question, three hypotheses are presented.

H1: Given the "right" environment and stimulation, students can self-generate motivations on their own.

H2: When students have motivations that move in the same direction, an interdisciplinary learning environment can be formulated.

H3: At Geneva Business School, we currently do not have the adequate learning environments that enable interdisciplinary thinking despite our strive toward responsibility.

At this point, the definitions of “right” environment and motivation remain broad. However, I believe that as I conduct research to test the hypotheses, I could narrow down, or at least provide an example to what “right” means. Thus, the purpose of the study is not only restricted to validating hypotheses but also to define the terms.

In the next sections, I will present the data gathering methods through contextual inquiries and surveys with students and professors. Then, these data will be evaluated to become information from which theories will be crafted. Using the theories as the foundation, an experiment is then designed to transform theories into concepts. Subsequently, these concepts will lay the foundation for hypothesis testing and constructing framework for future applications.

3. Methods

Contextual Inquiries: How Professors See Motivation

The first thing I did was to gain an understanding of how professors motivate students in their learning environments. For this study, I decided to use contextual inquiries in email form as the interview technique for a number of reasons:

- To develop an in-depth understanding of the interviewee's persona.
- To account for the fact that each interviewee has different environmental circumstances and thus, adapt the questions to each interviewee.
- Email form allows for more flexible correspondence considering the fact that these interviewees come from different parts of the world.

In total, there were eight professors from six different majors – namely, Management, Accounting, Architecture, Mathematics, English, and Finance. In exchange for in-depth and interpersonal exchanges, these professors wished to remain anonymous with mutual consensus on what can be disclosed. Strictly speaking, I place focus on the practices driven by personal beliefs of each professor.

How would you go about motivating students?

All the professors agreed that encouraging and complimenting students sometimes do wonder. For Mathematics and English professors, this method is especially needed for younger kids who seek and require more attentions from adults. For other majors whose target students range between late-teenagers and professional adults, compliments held more weights and were given to students who demonstrated good thinking and could provide valuable insights to the class.

For the Finance professors, she mentioned that she frequently encouraged students in her class because she knew some of the Finance formulas and models could be a bit too difficult for new students to follow and thus, encouragements could give them the push to try and practice on their own.

In a sense, the acts of encouraging and complimenting give incentives for students to receive rewards when they try harder, creating a mutual goal. However, almost no one ever mentioned the penalties, or the punishment side. For Mathematics and English professors, they believe that the punishments will demotivate students, and have a negative effect on students' learning as they perceived their students to be more sensitive; "English is such a basic subject to learn, imagine what the students would think about him/herself if he/she was told the performance was bad!" For professors of Accounting, Architecture and Finance, they held firm beliefs that punishment system will not do anything to

the students, because of two reasons, 1. their students are adults, and 2. they know what is best for them.

On another hand, the professor of Management had an opposing view. He mentioned that in his company, the practice of reward and punishment on the management level is quite common. Thus, he had a thought to implement the same system to the classroom. As it turned out, it only worked occasionally depending on the group of students and their failures/mistakes.

Are there any other practices that you would use occasionally?

One professor mentioned there was one time he invited a group of students out for dinner in an attempt to develop a better relationship between students and professor. His observation and assessment were that the class was mostly quiet and passive during the session; “maybe they were shy”, he thought. He believed that by having funs and talking with one another, they could get to be more active in class. As it turned out, those students were not shy at all. That night, students and professor alike, they were having a blast. However, the inactive situation in class did not improve at all.

On another hand, there was one professor who said something fascinating. She said she often played games with her students during class hours. She was the professor of Mathematics, and she said, “Mathematics can be challenging at times, and I can imagine not everyone likes Math.” Fortunately for her, there were resources and games that turned Math into something mutually accepted as fun. Thus, she embraced this idea and took it to classes, and students loved it. They learnt while they played, and they played alongside their teacher.

How did the COVID-19 pandemic change your classes?

Five out of eight professors said their classes remained unchanged. To them, the digitalization aspects only change one thing, that they couldn’t see their students’ faces all the time as some students didn’t have cameras. Furthermore, it would be unfair to require them to purchase additional equipment for no apparent reasons. Nevertheless, one professor proudly shared, “Despite the lack of visuals, when I asked them if they were there, and all of them answered, that’s good enough for me!”

For other professors, classes have become a lot more centralized due to the fact that students couldn’t whisper with one another like they would in physical class. “They might be texting each other behind the screens, but it had become the case where teacher is the most talkative, sometimes, it is quite lonely,” one professor shared.

How did you assess the students' motivation in your class?

Some noteworthy responses include:

"Quality is important, but I was more looking for quantity, […]."

"There was a time I would drop a class session; instead, I had some reflective conversations with my students, see if they have any concerns or feedbacks."

"It is difficult. Before I could tell somehow on their faces and behaviors in class, but after moving online, it is no longer applicable as I can't see all my students' faces, and they don't really talk that much."

"As long as they finish the assignments and tasks with thoughtfulness, and contribute to class discussion, I can consider that as being motivated."

"I would say it is a matter of willingness. There were times when I needed to pause and asked if they had questions; other times, they just asked on their own. That partially gave me a feedback if they students liked the topic or not."

[…]

Online Survey: Students' Motivation Factors

After gaining insights from the professors' point of view, I then move to understand the students' motivation factors. I designed a questionnaire consisting of six questions and sent it to different groups of students in four countries, namely Vietnam, Australia, Switzerland, and America (a sample of the survey is included Appendix A2). All six questions are multiple choices so that not to discourage students from taking them. In total, there were one hundred and eight anonymous participants mainly from University levels (estimated age group around twenty-three to twenty-six)

One of the first question in the survey was directed toward students' self-assessment on their own motivation toward learning. The results showed, 22% are very motivated, a majority of 61% said they are motivated enough to go the extra miles if it is worthwhile, the rest 17% said motivated enough to earn the degrees.

Next, I paid attention to the participants' preferred activities compared to their most memorable classroom activities. For their preferred activities, I presented the participants with six choices, four of which represent the four learning phases from the Kolb's cycle, and the last two choices are either all or none of them. As a result, 16% chose the Feel activities, 22% chose the Watch activities, 18% chose the Think activities, 24% chose the Do activities, and the last 20% chose all of them.

Despite this diverse range of interests, when asked about the most memorable experiences from classes, participants revealed a, what appears to be, trend among classroom models. In fact, 11% chose the “Diverging” environments, 14% chose “Assimilating” environments, only 8% chose “Converging” environments, 36% chose “Accommodating” environments, no one chose all of them, and the last 31% chose none of them.

By the end of the survey, there is a question that required the participants to assess their moods between before and after they had reflected on their past/current experiences at schools. As the result shows, after the reflection, 2% found themselves significantly happier, 59% have a slightly better mood, 38% have slightly worse mood, and the last 1% have a significantly worse mood.

By themselves, these numbers might not mean anything. However, an interesting find is that these numbers correspond perfectly with the results for amount of knowledge students retain from classes. In fact, 2% said that they learnt a lot from classes, 59% said they remember enough to cover their Resumes, 38% said they did not retain much knowledge, and the last 1% said they did not retain anything.

Experimentation: Students’ Motivation in Specific Contexts

In addition to data gathering by interviews and online surveys, I also designed a physical experiment to test the theoretic structure of students’ motivation. The aim of the experimentation is to observe how students behave in specific contexts of different learning environments. After the experiment was over, another set of in-depth interviews with all six participants were conducted in which opinions about environmental factors and motivational drives were given.

The experiment consists of three non-academic activities and I invited a group of six students from different majors – namely, Management, Finance, Marketing, Oil and Gas, and International Relations – to participate along myself.

Activity 1. Movie Interpretation

The first activity I thought about is to watch movies together as it is mutually considered and accepted as a fun activity. The most important question was what movie to watch as we had seven individuals with different tastes.

As the first rule, we agreed to do rounds of Rock, Paper, Scissors to decide whose movie idea we are going to watch.

The second and final rule is, that one person whose idea got picked would have to try his/her best to “enlighten” and “educate” the rest on why his/her

movie choice was constructive and meaningful after everyone had watched together.

Essentially, what we were doing was to watch a movie chosen by one of the members, then we listened to his/her explanation or presentation about why and how said movie was significant and meaningful. Dr. Ackoff said that "teaching is the best way to learn (Awal, 2015)," and this activity wonderfully demonstrated how accurate that statement was.

Here is what happened to the members whose movie choice was picked, for them to explain the meaning of the movie to other members, they first needed to thoroughly understand that movie for themselves first. It was no secret that some members even went the extra mile to research additional information about their movies. As the result, our group had the opportunities to experience, in my opinion, some of the best presentations about symbolisms and metaphors interpretation in movies.

The second prong to this activity is the formulation of a learning environment. Refer back to the role of the teach as a facilitator in a classroom, and their primary role was to help students learn. This was the kind of environment I was trying to create during my turn of movie interpretation. The first thing I did after the movie was to ask a question that made them think and reflect on themselves. Then, we followed up with a series of "why" questions – "Why do you think the character behaved this/that way?" These questions are the easiest to ask, because as answers popped up, we could almost immediately continue with another "why"; yet the answers to these questions are often rich with insights about a person's mental model, if given enough careful attention, the self-directed shift of mind[4] could become a very powerful experience.

Among other members, I was probably one of the less prepared, because clearly, I did not do any external research to understand the movie as thoroughly as others did. In fact, I did not present anything at all. Most of my effort was to ask questions and ask more questions based on the answers I received, and to also direct the flow of conversations in our group so that they did not stray away from the main topic. This actually created a very engaging atmosphere where students actively interacted with one another. Overall, I did a lot less work, but in exchange for a very favorable result.

Activity 2. Cashflow 101

For the second activity, I picked a board game called "Cashflow 101" designed by Robert Kiyosaki, and apparently, it is quite a popular educational game that teaches players about strategic money management[5].

[4] The person answering the questions becomes aware of how he/she is answering, and in turn questions him/herself; this is what makes double-loop learning possible.
[5] Sourced from the product homepage at Richdad.com and product page on Amazon.com

The way I see it, every game has a specific systemic structure that is built upon a set of predefined principles, some games which are more complex require interrelationships between multiple sets of principles. For Cashflow 101, the core idea of the game is for players to earn as much cash as possible and achieve their desired dream jobs, the “how” is up to the players to decide. Each game would last around one and a half to a full two hours.

As the only rule in this activity, we consent that no one would interfere with and influence another member’s decision under any circumstances. For me, on the other hand, I would occasionally take note of certain members’ decisions.

The learning opportunities could be found when we were playing with each other. In game design, there is a common term which has been the center of debates for decades, and it is called “the magic circle.” According to what Salen and Zimmerman wrote in their book, “Rules of Play: Game Design Fundamentals” (2004), the magic circle is created by the boundaries set by the game rules where players engage in the game with respect to harmony (p. 95). This means that players are likely to change their behaviors from their normal to those that match the atmosphere created and intended by the game. Furthermore, Cashflow 101 is an educational game that teaches money management and financial investment, making it an incredible opportunity to learn about what type of investors the members were.

What happened after was quite similar to the questioning session in activity no.1. I would ask members why they chose to invest in certain ways, and why not other ways. Aside from the Finance major members, there was one student from Marketing major demonstrated a very strong skillset in investment rationale whose reasonings were grounded in logics and interdisciplinarity without any prior knowledge related to Finance.

Activity 3. Case Study

Between July and August 2020, GBS students started receiving notifications about a case study competition for real life companies to win cash prizes. It coincided perfectly with this activity as participants could also practice and hone their thinking for the competition.

Due to restricted access on professional academic case studies, what we did was to gather and re-use the case studies we had from Winter 2019 and Spring 2020 Semesters. As it turned out, we had a bundle of fifteen case studies from Operation, Management, Finance, and Oil and Gas majors. We settled with choosing four best cases from the respective major.

For this activity, instead of participating like the previous two, I would play the role of the judge to create a more realistic competitive environment. In fact, psychologists and studies suggest that students, or humans in general, may be able to perform in a manner that exceeds beyond expectations and self-limitations if required by circumstances (Kohn, 2017; Ötting et. al.; 2020). The

group is subsequently divided into two sub-groups of three participants working on the same case to which they tried to provide the optimal solution; my responsibility was to observe the interactions and to take notes of areas that needed improvements.

By far, this activity is still my favorite learning experience. In his speech, Dr. Ackoff said:

> *"Experience involves physical problems, chemical problems, psychological problems, social problems, economic problems, philosophical problems, religious problems, and so on. There are different kinds of problems, and so we organize around these different kinds of problems. We take reality apart into disciplines, and we think disciplines represent reality. There is no such thing as […] problems. […] It's a problem, those adjectives describe the point of view of the person looking at the problem. They don't tell you anything about the problem, they tell you about the person looking at them (Awal, 2015)."*

For me, this is such an eye-opening insight as I recalled how case studies are organized at the Universities. Most of the time, students participating in case studies are trapped within the boundaries of the class perspectives, meaning students in Marketing class will be more likely to look for Marketing problems within the case studies; and the same goes for Finance, Human Resources, Management, etc … Why? Because professors have expectations, and for us students to get good grades, we need to match our result with the predefined expectations.

In the first session, it was an open case study, meaning there was no boundary around it, and it was completely different compared to when the members were doing them in class. In order to find a starting point, the group members immediately assumed the point of view under their major. Thus, it didn't matter what case study it was, a Marketing student would focus on Marketing aspects, a Management student would look at Management aspects, and so on. It was not long before the members within a sub-group started quarreling with one another with regards to the so-called 'correct' point of view. This is an illusion; there is no such thing as a correct point of view. Thus, having taken notes of this, I switched things up from the second session onward.

Again, what I did was mainly asking questions as members presented their points of view, guiding and helping them see the connections between different points of view; and according to Dr. Ackoff, this is what interdisciplinarity all about:

> *"[…] it means exploring the different points of view around the problem to find which one or combination our points of view will give the best solution. Nobody owns a problem, every problem is universal (Awal, 2015)."*

As a result, some of the more aggressive members started to calm down about holding their opinions and started venturing into others' points of view,

which may be completely foreign to them. For example, an Oil and Gas student was carefully listening to the explanation from a Marketing point of view, taking notes, and later was able to successfully establish a connection between the Petroleum consumption habit in America to a farmer's life in India, and it was much more than just the Greenhouse effect. It may sound unusual to you, but this is probably the most exciting thing I have heard in months.

4. Findings

Results from Experimentation and Hypotheses Validations

Hypothesis No.1:

First of all, in the interviews, three out of eight professors expressed their opinions that students are self-motivated by nature. This is further supported by the results from the online surveys which showed an overwhelming of 83% (ninety out of a hundred and eight students) who are motivated toward learning. Nevertheless, out of these ninety students, about 73% expressed their needs for the "right" learning environments that stimulate their self-motivations.

In this hypothesis, I mentioned the "right" environment, but how to define "right" remains at large. After reviewing Kolb's experiential learning cycle (1984), I decided to incorporate them in my research including interviews, online surveys, and experimentation.

In the interview, the Mathematics professor revealed her method of gamification in her lessons. It turned out that this method provided two learning environments which are "Accommodating" and "Diverging". While playing the games, students learnt to work with existing mathematical concepts, giving them concrete experiences. Afterward, the professor held a reflection session where students reflected on their experiences from which applications of concepts were derived. This testimony is closely related to activity no.2 in the experiment where members also participated in a boardgame. In both cases, students were observed to be engaging and motivated by the fact that they were having fun.

After activity no.1 was over, I held another series of in-depth interviews with each member. As a result, there were four members who expressed that their movie choices reflected personal and cultural values. Thus, to them, the activities were not just about doing, learning and having fun, it was also about challenging themselves in presenting and demonstrating such values to the group members. Thus, these four members were motivated not only by the learning opportunities, but also from being challenged on personal levels.

On another hand, one member confessed that he did not plan to engage seriously with the activities. However, after spending time watching and listening to other members' presentations, he felt responsible for contributing at least equal effort. Thus, for him, his motivation came mainly from his peers.

Exceptionally, there was a member who, at first, insisted that schools were a waste of time because, according to her, the professors did not teach her anything new or provide her with new and exciting thought-provoking ideas. According to Argyris (1991), this is the same behavior of blaming the environmental, or external, factors; for Senge (2006), this is a prime example of one of the seven "Learning Disabilities", called "The Enemy is Out There"

which states “there is in each of us a propensity to find someone or something outside ourselves to blame when things go wrong (p.18).” Thus, in an attempt to divert her attention, I suggest that “it could also possibly mean that you are not actively seeking those exciting thoughts yourself;” to which she asked, “how do I know if something exciting even exists to look for?” That was a very valid point. My best suggestion at that time was to give it a chance and seek help from the professors. In fact, she later did, that student approached a professor outside the classroom and asked for some pointers toward Finance in abstract form; and one of the possible fields she was advised with was behavioral finance. This subsequently led that student to the idea of, what Adam Carroll referred to as “Financial Abstraction” in a TEDx Talks in 2015: “When Money Isn’t Real – The $10,000 Experiment” which had become all the more relevant and powerful considering the technology age and pandemic situation we are currently in in 2020-2021. Thus, unintentionally, activity no.1 gave her a full cycle of “Diverging” – “Assimilating” – “Converging” – “Accommodating” where she was motivated to pursue new knowledge on her own.

Taking everything into consideration, not only I could prove my hypothesis no.1 to be correct, but I also could narrow down the definition for the “right” environments. As Astin (1991) and Mughal et. al. (2011) put it, students’ self-motivations manifested when they became a part of the learning process in which they are engaged and challenged.

On another hand, although there were visible factors that stimulated the learning environment, it is inappropriate to extract them for future applications. For one thing, human dynamics is a complex system, and under different contexts, it may render the studied assumptions irrelevant (Seagal &Horne, 2017).

Hypothesis No.2:

In the interview with the professor of Architecture, there were some interesting exchanges:

How do you briefly explain your work process as a professional Architect?

> *Architect: “[…] Well, the first thing would be to meet the clients and find out their needs […] then, we have a process called site investigation. Depending on how large, a team will be sent to the site to gather data […] Then, we have the development process of the blueprint […]”*

I had a look at the Department of Architect faculty in the University, almost everyone has a different specialized field, do you know if the work process will be different?

Architect: "[…] I would say not quite. In our training to become architects, we all go through the same process in a sense […] It is about the holistic view in general, the site, the sceneries, the neighborhood, the building, the rooms, … we have to consider everything, and not just one part […] If you see a specialist in architecture and design, that doesn't mean he/she only focuses on the blueprint designs, because he/she can't, and shouldn't design a blueprint without other inputs."

These exchanges were fascinating in a way that they view interdisciplinarity as something natural to their job. Despite having specializations in Interior Designs, Exterior Designs, Urban Designs, Structural Designs, etc …, they don't lose focus of the big picture of how the house would look like. For them, the house is the final goal that they have to reach. This is very different from how Business courses are designed. In fact, in the interview with the professor of Accounting and Finance, they mentioned their programs were designed around these specializations instead of Business as the whole.

I have seen the curriculum of the Finance/Accounting major, and I found it very Finance/Accounting centered. Do students have chance to review other aspects of business?

Finance: "[…] Essentially, the program offers other electives which may have other business aspects, students may choose to take them per their interest."

Accounting: "[…] I'm actually not sure about it, but for Accounting, we move in a logical order starting with basic, then intermediate I, II & III, then we have advanced accounting before going deeper into tax, cost and managerial."

Management is in the same position. Some University curriculums have very specific specializations for Management field – International Relations, Supply Chain, Operation, Marketing, Finance, etc … yet very few classes actually go beyond the boundaries of the respective fields and establish connections that link them together. In the interview with the professor of Management:

Were there any discussions about how International Relations and Supply Chain Management link together in your class?

Management: "[…] There is a connection for sure, but we avoid talking about it. I teach International Relations Management, and in our University, Supply Chain Management is a separate program. To save time, we would avoid the overlapping topics."

From these exchanges, I realized that interdisciplinarity is less practiced and encouraged than I thought it would be. However, from the online surveys, 61% of students said they would be willing to go the extra miles outside their respective majors if they find it worthwhile to do so.

Furthermore, in the personal interviews with members after activities no.2, all members reported to direct their focuses and energy toward the same goal. As per the game's rule, all the members were given a choice of their interested end-game career at the beginning. If they manage to get rich quick and clear the game for themselves, they can get their dream job. Thus, despite the diversity in backgrounds, interests, and majors, they were looking forward to win the game. This conformed movement toward the same goal disregarded and overcame the boundaries and barriers set by specialized knowledge.

As mentioned before, out of all the members, there was one Marketing member performed very well in the financial game despite having no prior knowledge related to Finance. In fact, after having learnt the results and significance of his decision makings, this member gained the courage and was self-motivated to participate and engaged in real life trading activities. By stepping out of his comfort zone, he self-learnt some of the trading techniques that allow himself to navigate and make decisions on the stock exchanges. In turn, this person joined the Financial Investments group of students to exchange and to further his own trading strategies.

In activity no.3, the mutual goal was to provide solutions to the case study despite the clash in points of view. However, as guidance and directions were given, members turned to appreciate the interdisciplinary thinking which extends their prior knowledge. In a span of half a month, we have spent a solid amount of nine hours in total just talking about one single case study, and all the participants including myself were thrilled to be immersed in the conversations. In an all-member post-experiment reflection session, we all expressed a mutual feeling that our point of views, and opinions were appreciated and critically evaluated as well as considered. Furthermore, these points of views and opinions were used as the foundations from which different branches of disciplines were formed; and subsequently, these branches of knowledge assisted us in tracing these disciplines back to the root of reality (Figure 7).

Having reviewed the research result, I can validate the hypothesis no.2 which states that interdisciplinary learning can be formulated by directing students' motivation toward the same positive direction.

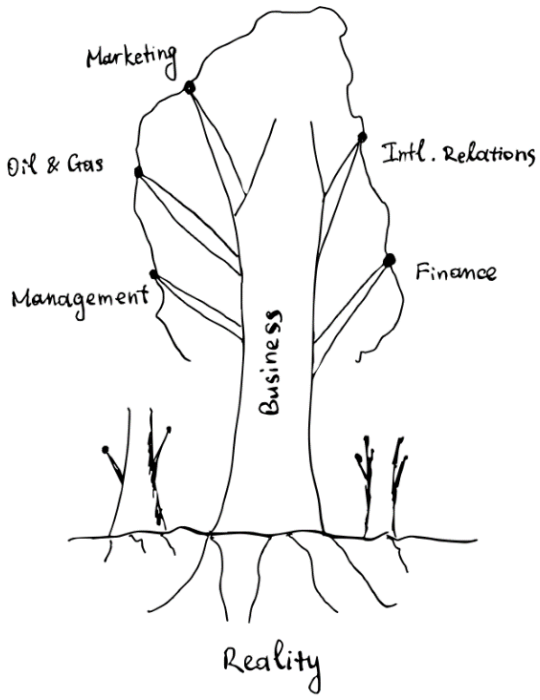

Figure 7: Reality

Hypothesis No.3:

To validate hypothesis no.3, a critical reassessment and reflection on my own experiences at Geneva Business School is required. In addition, I also include insights and opinions from professors and students at the University.

First of all, it is a common practice for professors to hand out reading assignments in form of slides, articles, books, journals, … to students; yet one assumption that critically changes everything, and that is professors assume, for the best scenario, that students will read those assignments. In 2007, Nicol et. al. argued in their article, "Formative Assessment and Self-regulated Learning: A Model and Seven Principles of Good Feedback Practice" (2007), that "students are already assessing their own work and generating their own feedback." They further pointed out that high education model should take advantage of this ability as the foundation to assess and evaluate students' ability to learn on their own.

The way I see it, there is a fundamental flaw to this argument and to the assumption practiced by educators, that is the lack of considerations for students' motivations. "Will the students be interested enough to read these assignments?" is, in my opinion, a worthwhile question to ponder.

Among twenty classes I took between 2019 and 2020 at Geneva Business School, there were eight classes with weekly intensive and extensive readings; and among these eight classes, only one of them implemented a reward-

punishment system that, in a way, forced the students to read the assignments. Through in-class observations and contextual inquiries, the seven classes that operated on the students' willingness to participate revealed that around 85% of the students did not read the assignments. On the other hand, interestingly, the one class that implemented the force system revealed that approximately 90% of the students were satisfied with their learning outcomes even though more than 10% of them did not pass the class.

In that one special class, students were required to read a wide array of works related to different fields. Some students had argued that they considered the materials to be irrelevant to the scope of the class, and they found themselves asking questions like "why do I need to read this?" As it turned out, in addition to reading, students were forced to engage in many rounds of asking and answering questions with the professor. For them to do that, they needed to at least read or, in some cases, skim through the assignments at least once to have an idea of what it was about. Through these rounds of challenges, connections between seemingly disconnected fields were suggested to the students. In doing so, the students feel their personal values and knowledge were being put to the test; and in fact, as the Semester progressed, the students spent more efforts in challenging themselves and the professor, drastically increasing their excitement.

When I told this story to the professor of Management in the interview, he replied:

> *Management: "[…] I would agree with the reward-punishment approach in this case, and I can see why it worked also. The same goes in my company, when a manager wants his/her employees to do something which misaligns with their interests or willingness, one approach is to win against them in a challenge. If the employees can't prove to their manager that they are on the right, then they have to follow the instructions as the punishment […] Of course, a good manager doesn't stop there, he/she needs to follow through with the instructions, helping the employees see their added-values over time […] the same principles apply in this class."*

On the other hand, for the other seven classes, the professors did not motivate or create any incentives for the students to read. For those who decided to read, the professors also did not extend, expand, or elaborate on the topic that was going on in the assignments, which actually produced counter-intuitive results as students then had absolutely no *external* reasons to engage in the materials. As for their *internal* reasons, it depended on whether they found the materials interesting enough. As suspected, in some interviews with the students from these classes, they reported that the professors "almost never" explained what the texts were about beforehand. In class, they only asked if anyone had read them. One student explicitly said: "Mr. Y keeps saying that the articles are interesting, but I don't see how they are interesting at all!"

Refer back to the topic of behavioral finance, in eleven Finance focused courses I took between 2019 and 2020, I would occasionally have some

professors mentioning behavioral finance with one professor explicitly said, “psychology matters, and behavioral finance is the future.” Despite this, what came after was inadequate teaching techniques and understandings of the field following the failure to capture the interests of students.

Another experience I want to refer to is the professors’ unwillingness to venture out of their comfort zone. In an interview with graduates about their experiences at the University, I found one student with a thought about how racism impact the behaviors of inflation rates. For me, that was interesting, so I asked him what the professor said. He replied:

> *“I didn’t say it to the professor, he looked like he wouldn’t want to pursue the topic. Actually, from the beginning of the semester, he made it very clear about the scope of his class in the syllabus.”*

In order to test the willingness of a Finance professor’, I once suggested the idea of interprofessional guest speaker where the speaker has a different professional career than the class’ focus. My suggestion was to invite an Artist as a guest speaker in a Finance class. The response I received back was very brief and explicitly mentioned that such activity was outside the “scope of the class”. Reflecting on Senge (2006)’s seven “Learning Disabilities”, there is clearly another disability that took place in this line of thought; and that is “I Am My Position (p.17).” The thought “I am a Finance professor, and so I should focus on teaching Finance” is dangerous in a sense that it obstructs and prevents learning opportunities not only for the educators, but also for the students. This also demonstrated the professors’ unwillingness to break the boundary around their own thinking.

In an in-depth interview with one student after the Winter 2020 Semester, I received some of the meaningful responses as follows:

So, 2020 is ending, what are you going to do during the break?

> *T: Not sure yet, man. Probably just stay in Geneva for a while.*

Did you learn something nice during the Semester?

> *T: I would say so, I mean I learnt some stuffs which were not intended by the professors, you know? I think all of us did, for example J was very excited about learning and understanding options trading.*

Did something interesting happen in any of your class?

> *T: Actually yeah. Remember A? We were in the same class […], and during introduction, he said he wanted to do […] which was rejected right away because it was outside the scope of the class. Imagine having your expectation crushed on the first day of class. Got to be tough.*

How about class […]? Are you taking it this semester?

T: Yeah, it is one of the required. But it is different compared to last semester, now there are more students from management and marketing majors in the class. But imagine having almost the same powerpoint slides and topics taught to them. Poor people, they don't understand the […] model at all.

[…]

Taking all into consideration, it was quite hard to validate the hypothesis no.3, because there were both positive and negative educational practices. However, in 2020, the professor who made positive impacts in the students' learning retired from Geneva Business School. For that, I would conclude that the University currently does not have the adequate learning environments that enable and encourage an interdisciplinary approach for students.

A Framework for Interdisciplinarity through Motivation

After validating the hypotheses, I now move on to develop a framework to identify areas for improvements. This framework is an extension of the Learning reinforcing feedback loop at the beginning in which interdisciplinarity is considered a process whose main driver is the students' motivations.

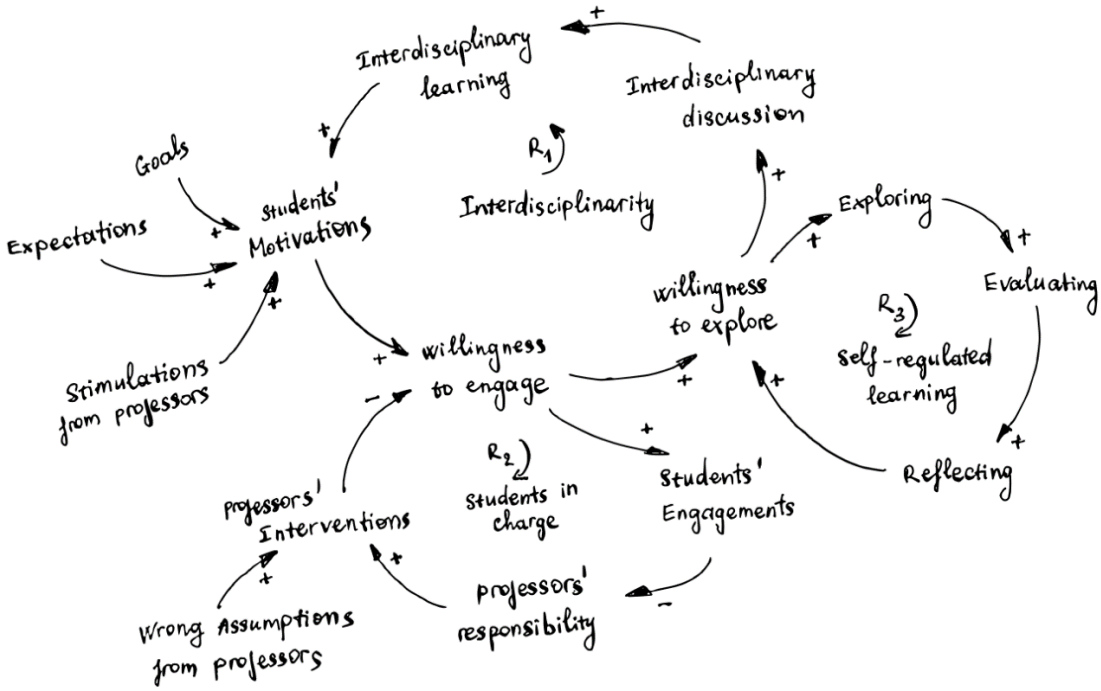

Figure 8: Process of interdisciplinarity

Reinforcing loop of Interdisciplinarity

For the process, I chose the students' motivations as the starting point which is fueled by the students' goals and expectations. When students are motivated, they have more willingness the engage with class contents and materials. In

turns, these engagements motivate students to explore and venture out of their majors, making ways for interdisciplinary discussions and learning. As students' learning build on and extend their prior knowledge, they gain more motivations for learning and the cycle repeats.

Reinforcing loop of Students in Charge

When students are willing to engage, they will engage not only with professors, but even more than so with other students. A Spanish philosopher by the name of Jose Ortega y Gasset, in his book "Mission of the University" (1944), suggested a concept of a "mobilizing idea"; ideas that excite people and push them to act with conformity. One thing that is seemingly obvious but often overlooked is that the relationships between students and students are, most of the time, much better than those between students and professors. Thus, once some students are motivated and willing to engage, the feelings and energies will rub off on other students as well. Furthermore, as students engage with one another with regards to class materials, professors' responsibilities will reduce, lessening the efforts required to intervene with the students. A negative relationship between professors' interventions and students' willingness to engage means that the more professors intervene, the less willing students become[6].

Another thing we need to consider here is the influencing-only variable of Wrong Assumptions. In his speech Dr. Ackoff pointed out:

> *"[…] the faculty operates on the assumption that it knows what the students need to know (Awal, 2015)."*

This happened not only many years ago, but also even now. In fact, in a series of emails exchange with some professors, I found that professors prepared their syllabus schedule way before they started teaching a specific class. This means that professors have made two assumptions, and they are 1. Students need to know a certain set of concepts or ideas which the professors think important enough, and 2. The students have yet known these concepts or ideas.

Subsequently, these assumptions educators had made for the students contributed to their inflexibility. As a matter of fact, some professors were found unwilling to adjust their pre-determined schedules. Recently during Winter 2020 Semester, I emailed a professor regarding the teaching of WACC formula, mentioning that this had been covered by so many other professors in the previous Semesters. In the reply email I received, the professor mentioned that it was part of the syllabus, so we need to go through it eventually. To me, this is a prime example of being imprisoned by the planning whose primary purpose was to only guide us. This way of thinking obstructed students' engagements

[6] This statement is a contextual and observational assumption

when professors acted on their assumptions that they knew what best for the students.

Reinforcing loop of Self-regulated Learning

When students are willing to explore and venture out of their comfort zones defined by their specialized knowledge, they will trigger a self-regulated learning process by and for themselves. As suggested by Nico et. al. (2007), this process happens with students exploring the ideas by researching, followed by data/information evaluation in which students apply their skillsets and prior knowledge. From there, students reflect on the results and process they had been through, laying another layer of foundation for inquiries and explorations.

Balancing Loop: An Obstruction to Interdisciplinary Learning

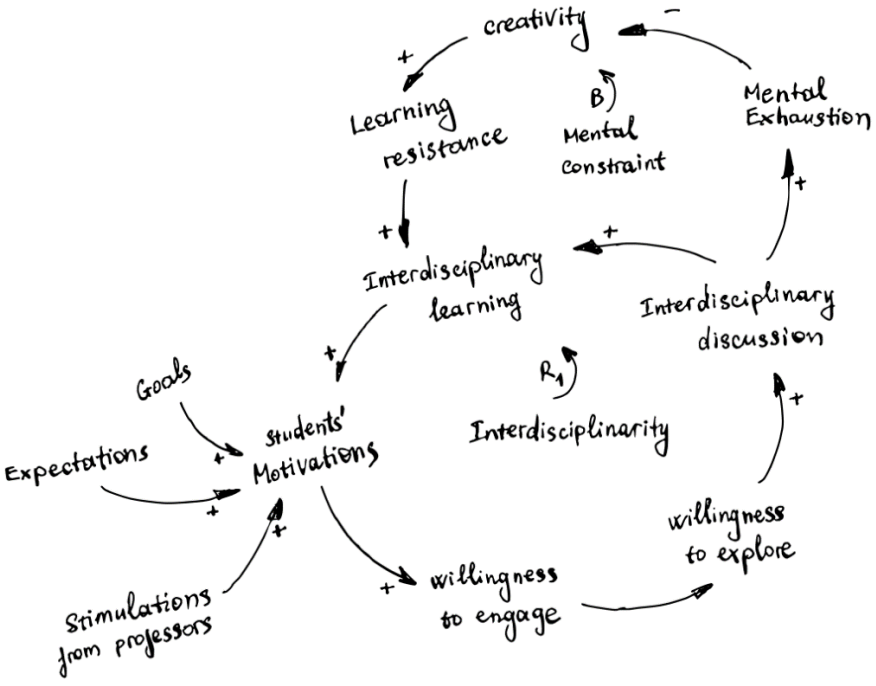

Figure 9: Balancing loop of Mental Constraint

So far, the causal loop structure in Figure 5 shows three reinforcing loops which is unrealistic. In reality, nothing can go on forever, and it is the role of balancing loops to keep the reinforcing loops in check (Senge, 2006). In Figure 6, the balancing loop here is Mental Constraint. Very few human beings have

the mental capacity and drive to consistently pursue knowledge in a field they are often unfamiliar with; and this is expressed as Mental Exhaustion, students become unable to think straight and effectively. In turns, this exhaustion reduces creativity and creates learning resistance where students become demotivated to, and eventually give up on pursuing the topics.

Challenges and Future Applications: A Proposal for Online Learning

Challenges

Reflecting on recent studies done by Santos et. al. (2017), Bear & Skorton (2019), and Santaolalla et. al. (2020), there are incredible needs to acknowledge the flaws and to reassess the current educational practices. Under system lens, each classroom may be a distinctive system, yet they are interrelated systems as they share the same parts who are the students; such is reality, everything is connected, yet we don't always see it because we are not encouraged to behave in such ways. Hence, one of the biggest challenges, in my opinion, lies within the teachers and educators, and their ability to shift their own mindsets.

Next, it is worth pointing out that the causal loop structures proposed above are merely a conceptual framework that needs to be challenged and developed in accordance with reality. Thus, another challenge for teachers and educators is their ability to critically reflect on the learning environments that happen in their own classes, and from there, to identify the leverage points – the "points of power" where small changes could lead to huge shift in behaviors[7] – inside the systems.

Applications: Proposals toward Online Learning

In their conclusion, Santos et. al. (2017) wrote:

> *"[…] the University as mediation to learn to formulate ways of thinking/feeling/acting, not to replace them, but to transform them (p.76)."*

This can be interpreted as Universities should be the place that encourages and allows transformation of the mind in which we change our worldview from one to another; yet we do not disregard our prior knowledge for they provide valuable insights and opportunities for reconstructions of practices (Santos et. al, 2017); and the best method to do that is through interdisciplinary approach. Through interdisciplinarity, we re-establish the severed link between ourselves

[7] "Thinking in System" by Donella H. Meadows (2009), Part 3 – Chapter 6: Leverage Points – Places to Intervene in a System, p.145

– where we came from, what we do, what we think we know – and the reality that we perceive.

After putting together the insights from professors' interviews and experiment results, my first thought is to decentralize the classroom model. The way students perceive the role of teachers can also create obstructions for their own learning. In fact, teachers are thought to be the one in charge and control the flow inside the classroom. This needs to change, teachers should be willing to step down and delegate parts of their responsibilities to the students. In doing so, they *"involve"* the students in the teaching-learning processes (Astin, 1991). There is a very old set of Chinese proverbs that go like this:

"Tell me and I will forget,

show me and I will remember,

involve me and I will understand."

- *Confucius, 450 B.C.*

An important aspect of learning is applying, and application is a by-product of understanding. It is good if the students can learn, but it will be even better if students can apply what they learn in their daily lives; and educators hold the power to let it happen. This is a skill-based learning approach where students will develop skillsets by being parts of the teaching process, rather than the receivers of the teaching results (Brackett et. al., 2009: p.329-333)

Next, my second proposal is to bring our thinking back to the root of specialization, and to *establish the whole, before we move to the parts*. Business schools should have a course on holistic views of Business where students from different knowledge branches of business get together and present their learning. In doing so, their ideals may clash against one another, but that is part of the learning process that creates values and significances.

In the age of digitalization where distance and online learning have become dominant, new and even better opportunities have been made available to us. One of which is the possibility of interprofessional collaboration between Universities of specialization, and between countries. In an attempt to search for scholarly records and articles, I found only one field that regularly publishes this kind of records and articles, and that is the Medical Training records relating to Nursing and Doctor practices. Nevertheless, none of the search results were about Business.

Thus, my third proposal is to make interprofessional collaboration between Universities or Organizations possible. The collaboration can be between two business schools to compare the teaching-learning processes, or to have students from one school cross-teach students from another school. To expand the possibilities, a collaboration between business schools and psychology institutes would no doubt create some dynamics.

As mentioned before, in Finance, we have the behavioral aspects, yet Finance professors often don't know enough about the topics to engage and challenge students. Furthermore, business is all about people, yet students are not taught in such way; for us, it is the idea of money and profit-making that is engraved. Thus, that's where interprofessional collaborations come in with new perspectives.

Limitations

One of the main limitations in this paper is that we did not touch on the main source of motivations, not only students' motivations but also professors' motivations, questions such as "why do students go to school?", "why do professor teach?" These are important and powerful variables that can completely render any models irrelevant. However, to research about students' and professors' core motivations requires an in-depth understanding of human dynamics and psychological studies which, under different circumstances, can be heavily influenced by the surrounding environments. Thus, this paper made a simplified and ideal assumption that students, deep down, have desires to learn, they are just not exposed to the appropriate approach; and the same can be said for professors who do not have the appropriate teaching model.

Next, the lack of definition for the "right" environment and the "right" stimulation remain at large. There is simply no possible way to define the terms as consideration and identification have to happen with specific context.

Thirdly, the causal loop structures proposed above are highly subjective and thus, under different perspectives and circumstances, can drastically modified. For example:

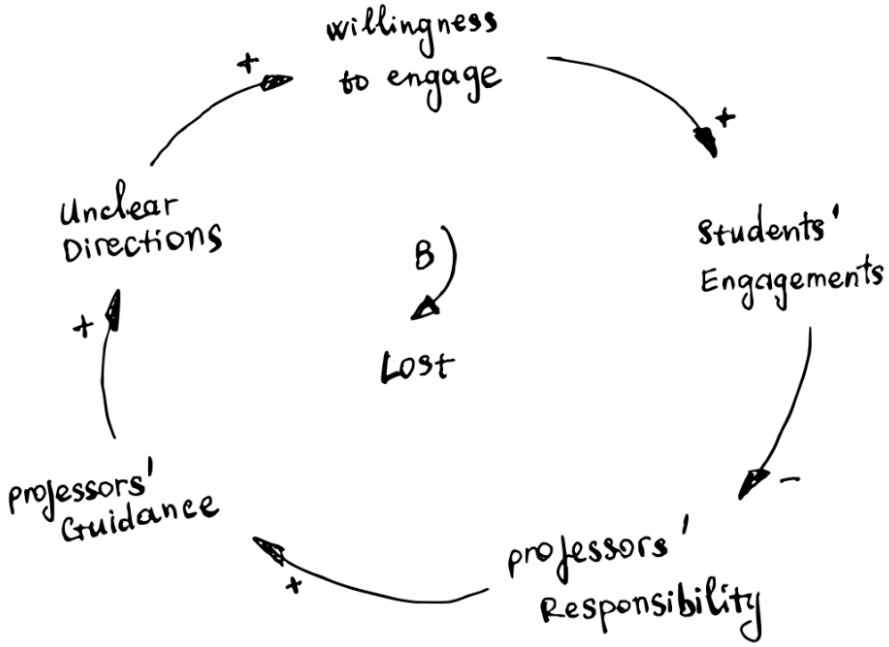

Figure 10: A different perspective to professors' interventions

In Figure 7, I took the reinforcing feedback loop of Students in Charge and applied a rework for it. In the old version, Professors' Interventions variable was considered a bad influence on the students' willingness. However, here in this case, this variable is changed to Professors' Guidance and is considered a

good influence. What happens here is that when students' engagements overshadow the role of professors, the lack of guidance will create unclear directions for the students, which negatively affects their engagements. Thus, this is also an example of how professors can take advantage of causal loop diagrams to direct the learning environments behind the scenes.

Last but not least, from the survey results, it was shown that students did not find their online learning environments align with their interests. I did not propose a solution for this – in fact, I could not – because the answer can, and has to, be formulated based on a specific context.

Recommendations for Further Development

For further studies, my suggestion is to express some variables, such as Motivations, in the stocks and flows structure[8]. This is an advanced system dynamics modeling technique; and as of right now, due to time constraint and inadequate understanding, my proposal was based on causal loop diagrams instead.

Another point that is worth considered is to expand the boundaries of the proposed framework. For example, we have influencing-only variables such as "Goals" and "Expectations," one thing we can do is to explore different feedback loops which embed these variables. In fact, this could be a fantastic opportunity and topic to be pursued in a collaboration with Psychology and Web Designing – how designs of online platforms create incentives for students to engage in online classes?

Conclusions

Reaffirmation

Revisiting the hypotheses, I first conclude that given the right environment and stimulation, students can self-generate positive motivations toward learning. Secondly, through interviews and experimentation, I found concrete evidence that the process of interdisciplinarity can be driven by the students' motivations. What educators need are the ability and the skills to direct students' motivations toward the same goal. As mentioned by the professor of Architecture in the interview, professional architects don't just see their own products, they see their products *and* the relationships their products have with respect to the surroundings. However, this is not how current Business education is taught.

[8] For more information on this type of model, the audience can refer to "Business Dynamics: Systems Thinking and Modeling for a Complex World" (2000) by John D. Sterman, Chapter 6: Stocks and Flows, p.191.

Educational Practices and Aims

From the interviews, there are common chain reactions among students and professors. For professors, some voiced their concerns that students didn't talk or interact in classes. For students, they said they were bored and too unmotivated to catch up. This is not a good sign, because by the end of the course, students may pass by overnight cramming, but they will retain almost nothing of the contents outside of class. This is a waste of efforts and resources for both students and the University.

From the experimentation, all activities have two similarities which contradict the practices in Universities, and that is 1. The lack of a centralized figure, and 2. The lack of a boundary, or a predefined topic. Firstly, as the designer of the experimentation, I did not control the group in any way. In fact, I was participating alongside the members, and it was clear that students were very willing to take charge of their learning and align it with their interests without anyone telling them what to do. Secondly, one element that can influence our thinking in major ways, but often overlooked, is the title. In University, we have class names and titles which give students' specific expectations even before attending classes. In the experiment, however, there were no titles, no expectations in prior, allowing the possibilities of creativity.

Thus, essentially, we are looking at a motivation-driven education model where students and professors can talk and explore the connections of their respective interests and how such connections can benefit their professionalisms. If we can implement such approach, not only the students can become more involved in their own learning, but also the professors could reduce their workloads of detail class planning and presenting. Furthermore, as demonstrated in the experimentation and agreed by other professors, by being involved, students have the opportunities to learn in the process of doing, and that is one of the most powerful types of experiences (Awal, 2015).

Proposals

One way of involving students is through relevant learning activities. As demonstrated by the two professors in the interviews, contradicting the counter-intuitive results of out-of-context activity, gamification had a direct impact on the students' learning outcomes because it was relevant. However, a challenge for educators is their ability to connect two seemingly distant ideas to make them relevant for the students. In my experiences of experimenting, Cashflow 101 and Monopoly are two fantastic games that teach the principles of money management and investment, suitable to grab the interest of non-Finance students. Moreover, these games are also available for online participations. Additionally, stimulation-based activities with weekly reports are also highly relevant, an example is "The Business Strategy Game[9]" where students are

[9] Sourced from their web page: bsg-online.com

competing against each other in teams in an online business that produces periodically results.

Another proposal that Geneva Business School can consider is a new perspective on the Conference course. At its core, the Conference involves a guest speaker giving industry insights to the students. To make it more students-centered, the University can consider encouraging the students, or group of students, who have interesting insights that they want to share with other students as well as the faculties. Essentially, students will be informally presenting to and defending their ideas against the student body and faculties. As observed, those who participate are often the one serious about their learning and learn the most throughout the process.

With online platforms being developed for educational purposes, cross-institution collaborations are made available. One of the proposed future strategies is to take advantage of this opportunity. An excellent example is Harvard Business School whose elective subjects are delivered by other educational institutions in partners. Further in the process, the University can also delegate the responsibilities of researching educational partners and establishing connections to students of interests. With this, not only students can benefit diverse styles of learning, but also the University can gain insights into the structures of programs and curriculums of other educational institutions.

Author's Final Thoughts

Ultimately, someone may challenge the need for interdisciplinarity. One possible answer I can provide is to see the weight of our decision makings. After activity no.3 in the experiment, members had expressed their realizations of how impactful their actions were. "I didn't solve the problems, I pushed it to the other guys," one member shared. In addition, Senge (2006) mentioned a powerful quote cited by many, "today's problems come from yesterday's solutions", which accurately paints the reality of where we are today.

With the online education industry turning more and more competitive over the years (Allen, 2013), interdisciplinary approach in education can and will become the competitive advantage for Universities offering online and hybrid programs. Not only it is verifiable as proven by Argyris (1991), Senge (2006), and Dr. Ackoff (Awal, 2015), but it also is a critical element to sustainable learning through hypotheses validations and experimentation. Thus, with all considered, I am advocating for the encouragements and practices of interdisciplinarity in education, hoping we can be better prepared for what to come.

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Appendices

A1: Mental model

Mental model is a term commonly used in the field of psychology and systems thinking. To give a general and simplified definition, it is a person's worldview, the way how each of us perceives the world exclusively around us.

A2: A sample of the survey on motivation:

1. Working vs. Learning, Job vs. School, which side do you prefer?
    a. Working at Job
    b. Learning at School
    c. I haven't had any working experiences yet
    d. I have never gone to school
2. In terms of effort, finance, and emotion, how invested are you in learning?
    a. Very invested (learning is my calling)
    b. Normally invested (willing to go outside the Majors if they are interesting enough)
    c. Just enough to earn a degree
3. Which of the following activities are you MOST interested in? (choose e. or f. only when they are on the same level)
    a. Involvement on individual level (i.e.: experiencing class planning, leading conversations, …)
    b. Observing demonstrations (i.e.: watching a banker check stock markets and make trading decisions, …)
    c. Critical thinking (i.e.: explore and connect an unfamiliar field of study with your own interest, …)
    d. Practical exercises (i.e.: doing assignments, case studies, …)
    e. All of them
    f. None of them
4. What was your most memorable set of activities from classes? (If you experience one activity and not a set, choose none of them)
    a. Experiencing and Reflecting (Watching)
    b. Reflecting (Watching) and Generating Ideas
    c. Generating Ideas and Working with Ideas
    d. Working with Ideas and Experiencing
    e. All of them
    f. None of them
5. Which choice would you use to describe the AMOUNT of knowledge you retain from classes?
    a. Abundant
    b. Enough to cover my CV
    c. Not much
    d. Not at all

6. Compared to before, how did your mood change after reflecting on your experiences at school?
    a. Best day ever
    b. Better
    c. The same
    d. Worse
    e. My day is ruined