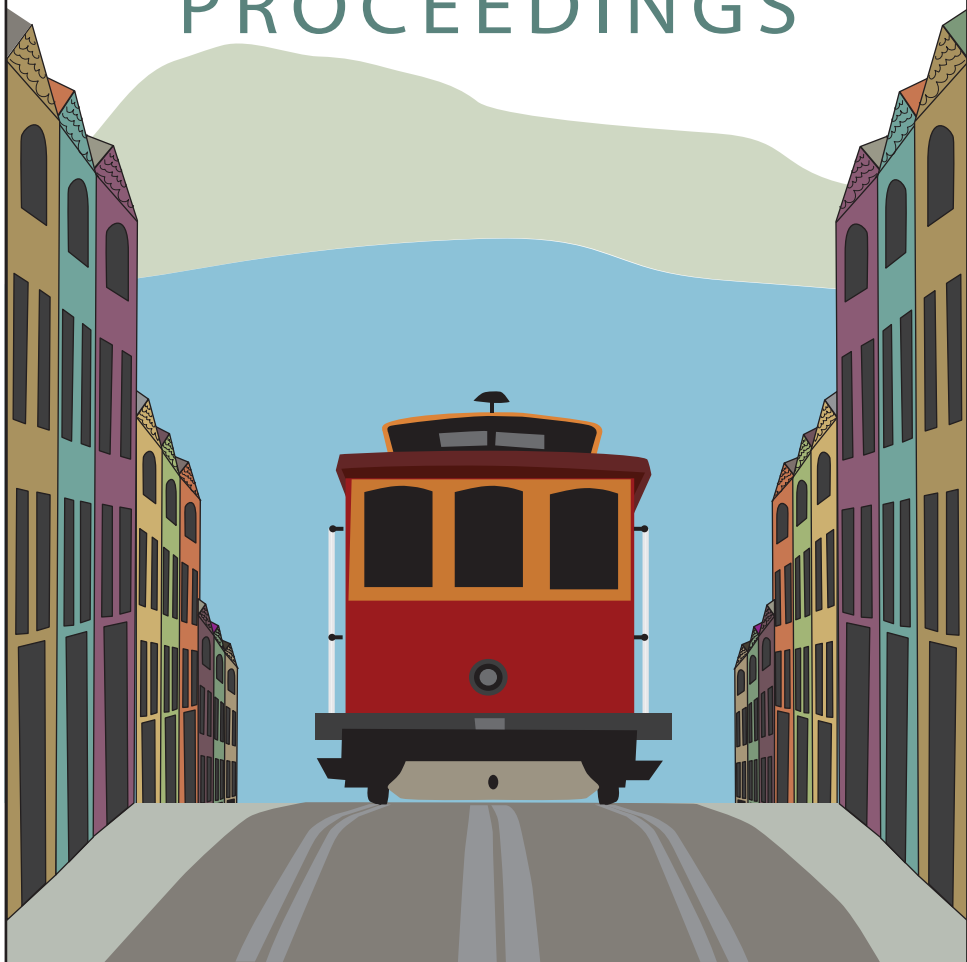


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# Videos As A Learner Scaffolding Tool

Marit Rismark, The Norwegian University of Science and Technology, Norway  
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## ABSTRACT

*Mobile and portable technologies have spread at an enormously pace in the last few years. Mobile technologies have allowed for new possibilities when it comes to the use of video for educational purposes. The ambition is that videos used for educational purposes should have a supportive, scaffolding structure or outline that assist student learning efforts. Understanding how to embed videos in teaching practice and knowledge about how videos may come to function as a support for learners is perhaps one of the more pressing needs of university faculty members. There is a need for further research on how videos may support and scaffold student learning behavior. We have explored and analyzed how university teachers use videos in teaching. The research focus is: How can videos, that are introduced into the teaching practice, support and scaffold student learning behavior? The research base is analysis of data-material from four studies of how videos can support teaching practices within disciplines such as sociology (1), biology (2) within engineering (3) and teacher education (4).*

*The purpose of the videos were to strengthen the existing practice according to specified pedagogical needs in the four studies. The idea was not for the videos to change the existing practice. Following this, the teachers incorporated videos into the existing practice. For example, students in some university courses used the videos according to planned and communicated procedures. Such line of action is a quite common approach in innovative educational work involving the use of technology. In the four research projects, we also see that use of videos supported the actual teaching practices in ways not accounted for. This illustrates that learning tools, such as videos, can influence teaching and learning, sometimes in unforeseen ways.*

*In the CLUTE presentation, we describe how videos functioned as a scaffolding provider in teaching practices, both in planned and in unforeseen ways. Findings show that videos supported and scaffolded learning behavior according to learning activities before, during and after class. The recurring descriptions in the data material cover the overarching category "Scaffolded study behavior". Three sub-categories describe the overarching category: Scaffolded preparation, Scaffolded participation, Scaffolded post-class activities.*

# The Effects Of Reminders On Vocabulary Use In L2 English Writing Tasks

Aeric Wong, Konan University, Japan

## ABSTRACT

*For language learning, the purpose of studying grammar and vocabulary is to be able to use that knowledge in a wide variety of contexts. Therefore, it is of interest to language instructors to determine what can be done to influence this.*

*The aim of this study was to examine the effects of minimal reminders on target vocabulary use in L2 English Writing Tasks. 26 participants from two intact classes were assigned to a reminder condition (N=17) and a non-reminder condition (N = 9). All participants studied the target vocabulary in one course and had to perform four writing tasks in another course. The writing samples were examined for use of the target vocabulary and were analyzed by (a) writing genre (recount, procedure, narrative, and report), and (b) individual participants' first and last texts (recount and procedure). The Wilcoxon signed-rank test (non-parametric equivalent of the paired-samples t-test) showed that the reminder group used more of the target vocabulary than the non-reminder group ( $p = 0.17$ ).*

# Promoting An Integrated Curriculum Across School Districts

Lauren Lunsford, Belmont University, USA

## ABSTRACT

*This project involves professors who are working together across colleges and departments to deliver interdisciplinary professional development to teachers across four very different school districts. The university's dedication to general education and an integrated curriculum is a critical underpinning to the work that has been embraced across the districts.*

*This project shows how the mission of our university's general education program has influenced the curriculum that we deliver and the partnerships that we formed. The general education curriculum that is part of a liberal arts institution is often the backbone of the institution, providing the avenue through which all students travel while at their university. At our university, our general education program is dedicated to promoting cross-disciplinary experiences for students in order to improve their academic competencies as well as their skills in the community and working with others. This project was developed from these same principles that we embrace as part of our undergraduate education program. This presentation will highlight the work of eight professors across five disciplines and two colleges to develop and implement professional development that promotes an integrated curriculum for middle and high school students. This project has been funded for two years and is in the midst of planning their second summer of professional development and ongoing support for school partners. Our partners have embraced the elements of an integrated curriculum, particularly as a means to integrate the Literacy for Science and Literacy for Social Studies CC State Standards. Davis, Choppin, McDuffie, & Drake (2013) have noted how the CCSS have required teachers to do more work to find activities that align with the standards and the goal of this project was to help teachers work together to identify synergistic activities to facilitate student learning.*

*This poster will begin with a brief overview of the university's general education program and how those components influenced the professional development developed for the teachers. A summary of the project's goals and outcomes will also be shared. A panel of professors with testimonials and video conferencing with participants will also provide participants the opportunity to ask questions about how an integrated curriculum can be successful in a K-12 classroom as well as how they might build on their own strengths as an institution to share expertise with K-12 teachers. An integrated curriculum is an approach that was introduced decades ago, with research dating back to the 1990s that support the use of this approach (Kleiman, 1991), and specific support for doing so at the secondary level (Beane, 1991). Despite this, many teachers struggle to find ways to collaborate across disciplines and a major aspect of this work is to model and facilitate these practices.*

*The goal of this presentation is to encourage university professors to examine their strengths and what is working at their university when promoting professional development for their school partners. This project was built upon the ideals of our general education program and translated into processes for schools to help them work together to facilitate learning for their students. Data will be shared that demonstrates how valuable this approach was for participating teachers. This has been an important way for us to motivate and engage teachers as well as to communicate our own strengths with them. Participants in our project have benefited from the professional development we've delivered as well as become stronger members of our community because they understand what our institution stands for on a deeper level now. Sharing this vision with our school partners is critical to capitalizing on the investments we make with them and communicating our value to the community as a whole.*

# Bridging the Americas One Teacher at a Time

Melissa Reed, Immaculata University, USA  
Annette Pelletier, Immaculata University, USA

## ABSTRACT

*This Bridging the Americas standard presentation provides attendees with a comprehensive vision for implementation of an international student teaching experience in Peru and its impact on international education and teacher development. The two perspectives presented are by the Chair of the Education Division who will focus on the international student teaching program design and the Program Coordinator in South America who will explore the socio-cultural context. This North/South and university/K-12 collaboration funded by the U.S. Department of Education Fulbright-Hays and the Undergraduate International Studies and Foreign Languages (UISFL) Program.*

*Bridging the Americas began when the Education Division at the University developed the Global Perspectives in Education program to increase the global competence of future K-12 teachers and administrators by implementing an international classroom observation placement and practicum experience, which included strong components of history, culture and language instruction. The objective was to offer cultural and linguistic learning that was grounded in personal interaction among persons of different cultures, ethnicities, socioeconomic levels, and linguistic heritage.*

*In May 2017, twelve undergraduate and two graduate students spent six weeks in elementary and secondary schools in Peru. Prior to their departure, students participated in trainings, including the logistics of traveling internationally and specifically to South America; the academic requirements of the program; the basic cultural, historical and political background of the country and the region where they will be visiting; and a basic conversational Spanish primer in conjunction with Rosetta Stone software. They also completed a Global Competency Aptitude Assessment to ascertain students' self-awareness, attentiveness to diversity, and intercultural capability.*

*In Peru, students were partnered with a cooperating teacher, who served as mentors and cultivated their integration in the classrooms. Students developed a teaching portfolio that included lesson plans based on Peruvian curriculum, reflective journals entries, a survey of the cooperating school neighborhood, evaluative reports from their cooperating teachers, and pictures of classroom activities. Students participated in weekly lectures on culture, history and language that directly addressed subjects related to international education including the educational system in Peru, immigration, globalization, transnationalism, social justice and social exclusion. The students also experienced cultural trips to museums, archaeological sites, historical sites in Lima, as well as a transformative trip to Lake Titicaca and Machu Picchu.*

*Post trip, students submitted their teaching portfolios and a culminating multimedia project of their experience in Peru. These projects were viewed by university students, faculty and administration at various events and accessible to the public on Youtube and the university website. Students completed various exit surveys to assess their experience as a whole including a more qualitative survey in narrative form, the Global Aptitude Assessment post survey, and a focus group was conducted with an outside evaluator.*

*The Global Perspectives in Education program supports the research that international student teaching and/or study abroad “encourages increased cultural awareness, improved self-efficacy and self-awareness, and professional development in terms of global-mindedness” (Cushner & Mahon, 2002, p. 49). The data from the aptitude assessment indicates that the student participants have an increased cultural awareness and attentiveness to diversity. Students have identified an increased awareness of Peruvian cultural contributions to the Americas and its diverse educational system. The international student teaching experience prepared the preservice teachers for a multiethnic school population in the North. We are bridging the Americas one teacher at a time.*

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# Green And Secure Energy Supply Chain: Through China Pakistan Economic Corridor

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Sadaf Mumtaz, Fauji Foundation College for Girls, Pakistan

## ABSTRACT

*Present Chinese energy supply chains are mostly dependent upon imported crude oil, but the route which is followed by crude oil ships passes through the Malacca Straits which is not very safe route. To judge how much China is worried about Malaccan dilemma could be accessed through Chinese recent action, in which they have assembled oil pipeline which passes through the Myanmar. But the problem with this pipeline is that it has very limited capacity even less than ten percent of total Chinese oil supplies. China has recently signed billions dollar agreement with Pakistan in the form of “China Pakistan Economic Corridor” (CPEC) and has also taken over charge of newly constructed deep seaport of Gwadar. Construction of new pipeline Gwadar-Khunjerab-Kashgar-Urumqi offers greatest opportunity to China to enhance the scope of CPEC and make it “China Pakistan Economic and Energy Corridor” (CPEEC). In this research comparative analysis has been performed to compare how much CPEEC route reduce distance, lead time, carbon foot prints and how much secure as compared to traditional route which passes through the port of Shanghai.*

**Keywords:** OBOR; CPEC; CPEEC; Green; Secure, Supply Chain; Oil; Case Study

## 1. INTRODUCTION

China is presently world’s leading manufacturing country [1], this is the result of Chinese liberal policies as well as due to globalization [2]. To take advantage of massive production competencies as well as globalization, China started reviving its old routes commonly known as silk route [3, 4]. This Chinese new silk route is termed as One Belt-One Road (OBOR)” [5, 6]. In this OBOR initiative China is constructing six economic corridors, out of these six one corridor is linking Western and Central China with Persian Gulf and Middle Eastern countries, and this is termed as China Pakistan Economic Corridor (CPEC). China is leading energy consumer of world; but China’s dependence on imported oil and ensuring security of energy poses great challenges to the security and energy policy makers of China, [7]. China consumption and production of crude oil millions barrel/day forecasted by energy information administration (EIA) is shown in Fig.1, [8].

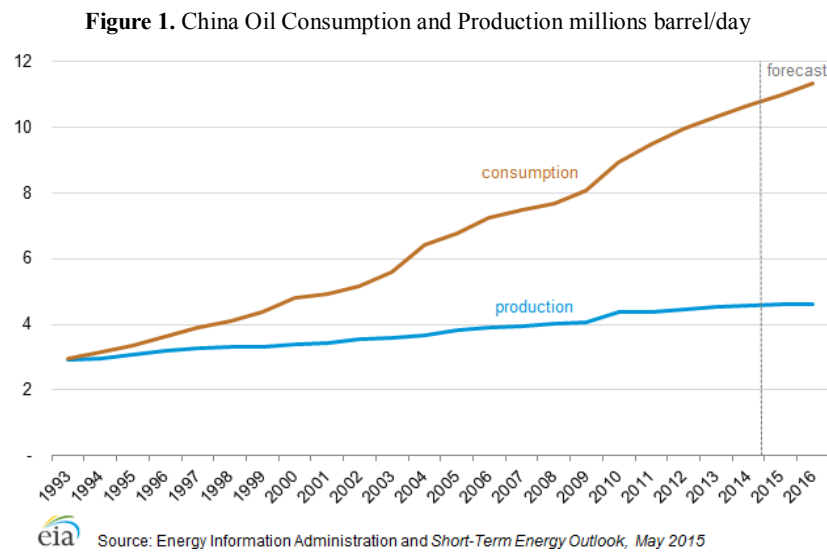
## 2. BACKGROUND

Traditionally Chinese crude oil supertankers ships carries oil from one of the Persian Gulf ports to the Shanghai port and these ships have to cover around 8250 miles distance moreover these crude oil supertankers have to pass through the Malaccan Straits, on which Chinese energy and security policy makers have lot of apprehensions .The challenges for which these crude oil supertankers have to take care off are, i) very lengthy distances; ii) crowding near Malaccan Straits; iii) pirate attacks around Malaccan Straits area; iv) dangers related to security, due to China’s territorial disagreements with neighbor countries v) conflicts due to geopolitics [9-14]. Just because of this reason China consider Malaccan Straits as weak point for economic growth of China. That’s why China is funding for construction of pipeline project through which crude oil would be transported; Urumqi is going to be connected with Gawadar through Kashgar. Though this oil pipeline project CPEC would be converted into “China Pakistan Economic and Energy Corridor (CPEEC)”. Frontier Work Organization (FWO) is the agency which is going to execute this project.

### 3. METHODOLOGY

In this oil supply chain case study the scenario analysis technique would be applied, [15-17]. Case study method have been applied quite often in researches related to supply chain [18-21]. For this case study three routes have been marked on map and presented in Figure – 2, the description of the routes are as following:

- **Route – 1:** Kuwait Port – Malaccan Straits – Shanghai Port – *Urumqi* in Xinjiang province of China (through railways over land).
- **Route – 2:** Kuwait Port – Kyaukphyu Port (Sittwe) – *Kunming* in Yunnan province of China (through pipeline over land).
- **Route – 3:** Kuwait Port – Gwadar Port – Kashgar – *Urumqi* in Xinjiang province of China (through pipeline over land).



**Figure 2.** Chinese Crude Oil Supply Routes



#### 4. RESULTS AND DISCUSSION

To calculate total distances and total lead time for each route first of all short scenarios were created. Where, for any site a to any site b distances and lead times were calculated differently depending upon the mode of transportation, for maritime calculations web based [22] application was used. For land based distance calculations ArcGIS network analyst software was used and for lead time calculations secondary data was used [23-27]. The distance and lead time data for short scenarios is presented in Table -1.

**Table 1.** Distance and Lead Time Data for Short Scenarios

Site A to Site B: Scenarios	Distance (mi)	Lead Time (Days)
Start point: Kuwait Port – End point: Malacca (maritime)	5130	19
Start point: Singapore – End point: Shanghai (maritime)	3110	11
Start point: Shanghai - End point: Urumqi (Rail)	2500	7
Start point: Kuwait - End point: Sittwe (maritime)	4680	17
Start point: Sittwe – End point: Kunming (Pipeline)	1745	8
Start point: Kuwait – End point: Gwadar (maritime)	1100	4
Start point: Gwadar - End point: Kashgar (Proposed Pipeline)	1870	7
Start point: Kashgar - End point: Urumqi (Proposed Pipeline)	3905	4

For final analysis and comparison the summary of total distance and lead time for all three routes is presented in following Table – 2.

**Table 2.** Total Distance and Lead Time for Three Routes

Route options	Distance (mi)	Lead Time (Days)
Route - 1: Via Shanghai (maritime/railways option)	10740	37
Route - 2: Via Myanmar (maritime/pipeline option)	6425	25
Route - 3: Via (Gwadar) - CPEEC (maritime/pipeline option)	4760	15

The qualitative comparative analysis for all three routes was performed and summary of advantages and disadvantages is presented in table 3 below.

Table 3. Comparative Advantages and Disadvantages - All 3 Routes

Route Option	Advantages	Disadvantages
Route – 1 (Via Shanghai)	<ul style="list-style-type: none"> <li>● No capacity issue till Shanghai</li> <li>● No pumping required</li> <li>● No Mountain peaks</li> <li>● No freezing issue</li> <li>●</li> </ul>	<ul style="list-style-type: none"> <li>● Longest distance and lead time</li> <li>● Most costly option</li> <li>● Mediocre railways capacity after Shanghai</li> <li>● Malacca Straits bottle neck</li> <li>● High geopolitics security risk</li> <li>● Piracy Risk</li> <li>● Adversary naval war risk</li> </ul>
Route – 2 (Via Myanmar)	<ul style="list-style-type: none"> <li>● No capacity issue till Sittwe</li> <li>● Second less costly option</li> <li>● Malacca Straits bottle neck bypassed</li> <li>● No geopolitics security risk</li> <li>● No piracy risk</li> <li>● No adversary naval war risk</li> </ul>	<ul style="list-style-type: none"> <li>● Relatively long distance and lead time</li> <li>● Very limited oil pipe line capacity after Sittwe</li> <li>● Pumping required</li> <li>● Moderately high mountain peaks</li> <li>● Moderate freezing issue</li> </ul>
Route – 3 (Via Gwadar - CPEEC)	<ul style="list-style-type: none"> <li>● <b>Shortest distance and lead time</b></li> <li>● No capacity issue till Gwadar</li> <li>● Refined oil transportation</li> <li>● <b>least costly option</b></li> <li>● <b>Least oil spill risk</b></li> <li>● <b>Reduced carbon footprints – green oil supply chain</b></li> <li>● <b>Malacca Straits bottle neck bypassed</b></li> <li>● <b>No piracy risk</b></li> <li>● <b>No adversary naval war risk</b></li> </ul>	<ul style="list-style-type: none"> <li>● Relatively limited oil pipe line capacity after Gwadar</li> <li>● Excessive Pumping required</li> <li>● Very high mountain peaks</li> <li>● Very high freezing issue</li> <li>● Landslides risk</li> <li>● Slight geopolitics security risk</li> </ul>

## 5. CONCLUSION

After carrying out the comparative analysis of all three routes it could easily be concluded that Route – 3 (CPEEC) is the shortest and least time consuming. As this **CPEEC route reduces distance and lead time** which have further many positive impacts e.g., lesser energy is used in transportation of oil; least carbon footprints making **energy supply chain green**; least oil spill risk, **least costly option**, as well as have minimum piracy and adversary naval war risks which also make **CPEEC route securer** because Malacca Straits are bypassed. The results of this case study also validate previously carried out researches Azfar et al., [2, 3] which are directly related to CPEC. Once oil pipeline would be functional it would be very beneficial option for western and central China and it would also convert CPEC into CPEEC.

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# Fostering Commitment To International Development Through Volunteer Work Programs For Students And Teachers

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## ABSTRACT

*One way to achieve optimal use of development aid is to capitalize on the low-cost human resources through the humanitarian spirit found among student and teacher volunteers in developed nations. Effective programs that employ volunteer teacher trainers, student workers, and health care volunteers can bolster professional development of teacher and student work experience in local communities; thereby meeting part of people's basic needs in developing countries. Such low-cost, cooperative efforts can energize the professional and international work expertise of both the local native people and the visiting volunteers.*

*This presentation describes how three such programs had and are having a positive effect on developing education, health, and language programs by supporting three international development programs: 1) an in-service teacher training program in English language in rural Thailand, 2) building a community health service in rural West Africa, and 3) constructing homes for the economically disadvantaged in The Philippines. A short summary of the goals and logistics involved for the volunteers in this three international development programs will be made. Guidelines for planning such programs, recruiting volunteers, and implementing a volunteer training program are outlined. Finally, ways to assist government offices, community welfare organizations, and schools to meet their manpower needs through cooperation with foreign education ministries, teacher training institutions, professional education organizations, and in tandem with committed individuals from developed countries are proposed.*

# Public Opinion On MOOC: A Sentiment Analysis Of Chinese Microblogging Data

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## ABSTRACT

*Massive Open Online Courses (MOOC) have gained great momentum and popularity as an innovative way of increasing access and equity in education around the globe (Abeywardena, 2014). Although originated in USA, MOOC has been widely adopted in Chinese higher education. Since 2013, MOOC has become the prevalent topic in China's education landscape. The number of people studying MOOCs has exceeded 10 million by the end of 2016 (Ministry of Education, 2016). Despite the fact that the educational research community has welcomed MOOC with a rapidly growing number of users, course offerings, academic conferences, and forums, MOOC has also steadily drawn criticism, which seems to undermine the notion that this new educational vehicle is achieving its original goals.*

*Some researchers argued that an important source of insight about MOOC is the discussions occurring in public media. As Kovanović and others (2015) noted, "these public sources can be used to identify important technical, social, institutional, pedagogical, and related challenges surrounding MOOC" (p.513), and inform future research about important areas of research of highest societal and public importance. Weibo (or Chinese microblogging) is one of the most widely used social networking platforms in China. By the third quarter of 2016, Weibo owns 297 million monthly active users and 132 million daily active users (Weibo Data Center, 2016). To achieve the objective of identifying Chinese public opinion on MOOC, Weibo data were extracted for sentiment analysis. The major contribution of this paper is a chronological view (from Jan 2017 to Dec 2017) of public opinion on MOOC for a span of 12 months. Through this view, a roadmap can be identified for future research and development based on public demand.*

*The extraction of Weibo was completed via the self-developed algorithm using the search terms "MOOC" and "慕课". Within the specified time frame, the relevant Weibo data were collected first and processed with the MS Excel application. A second-level cleansing of the dataset was conducted by filtering out microblogs by zombie accounts (automated accounts with the purpose of inflating follower counts). All user details were removed to ensure anonymity and unbiased analysis. The final dataset included 25,386 microblogs by 20,590 users.*

*Given that both implicit and explicit emotional features are contained in the textual data, the sentiment analysis was completed in two systems simultaneously: the natural language processing system deals with explicit emotional features, and the machine learning system detects implicit features of textual data. As a result of the sentiment analysis, Weibo data were divided into positive, negative and neutral categories. Each microblog was tagged with a numerical sentiment value of -1, 0 or +1 to indicate a polarity of negative, neutral, or positive, respectively. The sentiment data is then re-organised according to individual months of the Weibo history to identify public opinion trend on the chosen topic over a given time.*

*The analysis of the data focused on two major aspects: the number of microblogs over a 12-month span, and public sentiment of MOOC-related microblogs within the same time span. First, the total number of microblogs on MOOC showed an upward tendency over the past 12 months, with only 477 microblogs in Jan 2017 whereas 2471 in Dec 2017. To further validate our dataset, we compared the distribution of MOOC-related news in all major news media in China (more than 40000 news websites). In general, the distribution of MOOC-related news in the same time span followed similar patterns, providing an additional verification of the validity of our dataset to represent the coverage of the MOOC topic on Weibo. Based on the sentiment value, the public generally expressed positive points of view on MOOC, with a very small portion of negative views. Further, a comparison across gender in the positive, neutral and negative public opinions showed that gender differences were only observed in positive opinions with males being*

significantly more positive than their female counterparts. The longitudinal track in sentiment values of public opinions on MOOC for the past 12 months revealed a steady trend in negative points of view of MOOC, remaining at a rather low level. Whereas there was a dramatic up-and-down change over the months for positive views, with highest point reaching 85.16% in Nov 2017 versus the lowest point in June 2017 (58.92%). The change in negative views revealed a totally opposite trend.

*In a nutshell, the current findings implied that the general public are in a state of mixed views with respect to adopting MOOC for their own learning, or institution. The analysis of the Weibo data suggests that there is growing interest in MOOC in China. However, when considering public opinion on MOOC, it is apparent that the stakeholders haven't yet formed strong opinions on MOOC, due to it being a relatively recent phenomenon. The positivity towards MOOC is on an unstable trend, suggesting that the public are still unsure about MOOC. It is our intention in future research to find out possible factors that cause the fluctuation of public opinions.*

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# Programming In An Undergraduate Business Curriculum

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## ABSTRACT

*This paper is about teaching programming to business students on an undergraduate level. These students tend to consider information technology (IT) and information systems to be rather abstract and difficult subjects. Despite the fact that young business undergraduates have a good grasp of the use of modern information technology, their interest in how this technology actually works seems to be quite limited (Burns, Gao, Sherman, Vengerov, & Klein, 2014).*

*The approach described in this paper is to use an information systems standard textbook such as Laudon and Laudon and the standard curriculum of a foundational information systems course (Topi et al., 2010) as a basis for designing the course curriculum, but to somewhat limit the time spent on these subjects. The time saved is then spent on teaching some computational thinking (Wing, 2006) and programming (coding, using Python). In the past two years, the author has taught this content to 127 undergraduate students in a tri-national Bachelor program called “International Business Management”. The paper discusses the implementation of the computational thinking and programming element as well as the outcome in terms of student feedback and evaluation of learning outcome.*

## 1. THE UNDERGRADUATE BUSINESS CURRICULUM AND INFORMATION SYSTEMS

In a typical undergraduate business curriculum, there is at least one mandatory foundational course in information systems (sometimes labeled management information systems, business information technology, or similar). The general aim is to familiarize the students with the information technology and systems used in most organizations today. The participants of such a foundational course are mostly not interested in the technology itself, but focus in their studies on business subjects such as management, leadership, finance, marketing, human resource management, etc.

It has been stated that it is not an easy task to teach this foundational course in information systems (Frost, Pike, & Kenyo, 2008; Mukherjee, 2005). Some of the reasons are that students perceive such a course as difficult, abstract, “too theoretical”, or downright boring. Attempts have been made to ameliorate the perception of this type of course, but with limited success (see overview in Chen & Holsapple, 2014). Some instructors have focused on hands-on exercises with enterprise systems (Pridmore, Deng, Turner, & Prince, 2014; Seethamraju, 2007), but students might reply that they are going to be trained in using these systems by their employers and that such limited experience is not sustained. Others try to emphasize the practical importance of information systems in today’s business world (Schell & Mathieu, 2015), but – probably due to somewhat limited work experience of the majority of undergraduate students – this attempt is often in vain and students still label the content “theoretical”.

Some students challenge the information systems syllabus all together. A standard to “hold on to” can help to fight off this type of argument. The Association of Information Systems (AIS) has proposed a standard information systems curriculum, which outlines the content of an entire information systems degree program (Tobi et al., 2010). AIS recommends the foundational course in this standard curriculum (called “IS 2010.1 Foundations of Information Systems”) for all majors, including business majors. AIS directs the other courses only at students majoring in information systems, computer science, information technology, or similar. Thus, for the majority of business undergraduates, this foundational course will be the only course they ever have about information systems and information technology. Leaving them with such a meagre experience is thus a chance lost, potentially for a long period during their business career (Burns et al., 2014).

The relationship between business functions and IT has traditionally been a difficult one (Kesner, 2008; Looney et al., 2014). Different backgrounds, interests, and objectives are some of the reasons, but also the exposure to information systems during business education has an influence on the perception of the field. This happens primarily during the foundational information systems course. Hence, the question arises as to what to do to enhance the interest of young business students in information systems, besides the approaches mentioned above. The rest of this paper discusses the attempt to incorporate a section on computational thinking and programming into the standard syllabus of a foundational information systems course. First, it outlines the reasoning behind this approach: Why learning the basics about programming might be a vehicle to increase the interest of business students in information systems. Thereafter, the paper describes the approach taken in recent courses, followed by a brief report of the preliminary results in terms of both student feedback and learning outcome.

## **2. WHY A BASIC UNDERSTANDING OF PROGRAMMING IS IMPORTANT**

Several authors have stated that every student should learn programming (e.g. Crow, 2016; Steinglass, 2015; The Economist, 2017). Certain countries recently incorporated programming as a mandatory subject into their secondary school curricula (Dredge, 2014; European Schoolnet, 2014). However, the age group currently (and for some years to follow) entering colleges and universities have usually had no prior exposure to programming. If part of the secondary school curriculum was about information systems, information technology, or computer science, often it only comprised learning how to use common PC software and the World Wide Web. This has little to do with teaching computational thinking and familiarizing pupils and students with the rigorous way a computer “thinks”. Sometimes, this kind of teaching takes place in maths classes. However, many pupils and students are scared away by the mere mention of mathematics. Thus, this might aggravate the negative perception of the subject.

It is a fact that computers are ubiquitous. They have found their way into our private lives as much as into our work environment. There is, so to speak, no escaping them. Limiting the experience of students to the use of applications or to the “theoretical” description of information systems in organizations misses an opportunity to communicate a more profound understanding of information systems and technology. Put simple, computers consist of hardware and software. Hardware is the realm of electrical engineers, but software is business processes molded into code. Business people have to communicate their requirements as rigorously as possible, so that the software developers are able to code the corresponding programs. They have to learn to think in a “computational” way, in order to be able to connect with IT people.

Software already shapes our reality today. It will grow even more influential in the near future. Industry 4.0 is just one of many terms describing the impact of software on production and operations. Business processes are algorithms spanning organizational units and companies (global supply chains). They are subject to rigorous optimization and the results materialize as software. IoT (Internet of Things) is just around the corner and will increase the impact of software on our lives even more. Artificial Intelligence is gaining in speed and reach.

It seems thus to be important that every (business) students gains at least a basic understanding of how software – any software – actually works, not just how to use a specific application. This means that every (business) student should have some exposure to programming.

There seems to be a gap between business and information technology (He & Guo, 2011). Each side reproaches the other for not understanding their field. Business people claim that IT people do not understand their business needs and reality, IT people claim that business people cannot state their requirements in a rigorous and clear way. Can exposure to programming help to bridge this gap? True, many tasks in IT do not involve actual programming; nevertheless, all systems are eventually software applications. Thus, the ultimate interface between business and information technology is software, and software needs to be programmed. By exposing business students to programming, they learn some of the rigor that is required in software development. Through this, students learn how a computer “thinks”. It forces them to clarify their logic (much as in mathematics) and to code it, so that finally a (small) program will be the result; a program that can be run, modified, and that might provide them with a sense of achievement (not often accomplished in math classes). Gaining a foundational understanding of computational thinking and programming should contribute to a better understanding between business and IT.

3. THE COMPUTATIONAL THINKING / PROGRAMMING PART IN AN IS COURSE

3.1 The Bachelor Program

Applying the reasoning described above, the author has adapted the syllabus of a foundational information systems course in an undergraduate bachelor program in “International Business Management”. In this special tri-national program, students come from three different countries (France, Germany, and Switzerland) and study together in all three countries. Tuition is in French, German, and English respectively. The first semester takes place in Colmar, France; the second in Loerrach, Germany; and the third in Basel, Switzerland. Semesters four to six run in the same fashion. Semester seven is a final six month internship. Figure 1 gives an overview of the curriculum of this Bachelor program.

Figure 1: Curriculum of the B.Sc. in International Business Management

	1st year		2nd year		3rd year		7th semester
	Semester 1 in Colmar	Semester 2 in Loerrach	Semester 3 in Basel	Semester 4 in Colmar	Semester 5 in Loerrach	Semester 6 in Basel	Semester 7
<b>General Management (GM)</b> 42 CP	Introduction to Business Management 3 CP Financial Accounting 3 CP	Introduction to International Business Management Accounting 3 CP	Organization 3 CP Corporate Finance I 3 CP	Supply Chain Management 3 CP Corporate Finance II 3 CP	Leadership 1 3 CP Leadership 2 3 CP Service Management 3 CP	Strategic Management 3 CP International Taxation 3 CP Human Resource Management 3 CP	Bachelor Live Project III 18 CP
<b>Cross-Cultural Management &amp; Marketing (CCMM)</b> 36 CP	CCMM I Fundamentals of Cross Cultural Management 3 CP Fundamentals of Marketing 3 CP	CCMM II Communication Marketing Mix 3 CP	CCMM II Intercultural Management Styles 3 CP Marketing Research 3 CP	CCMM II Negotiation Consumer Behaviour 3 CP	CCMM III Cross Cultural Leadership 3 CP Marketing Strategy and Planning 3 CP	CCMM III Conflict Management 3 CP	
<b>Economics, Methods and Law (EML)</b> 40 CP	EML I Microeconomics I 3 CP Statistics 3 CP Business Mathematics I 3 CP	EML I Microeconomics II 3 CP Business Analytics I 3 CP Business Mathematics II 3 CP	EML II Macroeconomics I 3 CP Information Systems 3 CP Cases in European Business Law I 3 CP	EML II Macroeconomics II 3 CP Business Analytics II 3 CP	EML III International Economics I 3 CP Cases in European Business Law II 3 CP	EML III Intern. Economics II 3 CP Business Ethics 3 CP Digital Transformation 3 CP	
<b>Languages</b> 36 CP *Opposite of native tongue	Languages I English 3 CP French* 3 CP German*	Languages I English 3 CP French* 3 CP German*	Languages II English 3 CP French* 3 CP German*	Languages II English 3 CP French* 3 CP German*	Languages III English 3 CP French* 3 CP German*	Languages III English 3 CP French* 3 CP German*	
<b>Electives</b> 9 CP *Number and titles vary according to students' demand	Electives I* ICT Applications 3 CP Negotiation 3 CP Academic writing in French 3 CP	Electives I* Business Game 3 CP Rhetoric 3 CP	Electives II* Elective Language (Chinese) 3 CP Elective Language (Spanish) 3 CP Leadership Models 3 CP Development Economics 3 CP Socci., Media & Sports Mgmt 1/3 CP Trinational Economic and Political Cooperation 3 CP	Electives II* Elective Language 3 CP Elective Language (Spanish) 3 CP International Trade 3 CP Entrepreneurship 3 CP	Electives III* Elective Language (Chinese) 3 CP Elective Language (Spanish) 3 CP International Accounting 3 CP Financial Mathematics 3 CP Soft Skills 3 CP	Electives III* Elective Language (Chinese) 3 CP Elective Language (Spanish) 3 CP Corporate Social Responsibility 3 CP Mandulness-Training 3 CP	
<b>Live Projects</b> 24 CP	Live Project I 3 CP		Live Project II 3 CP				
<b>Reports / Theses</b> 15 CP			OTF Thesis (Report + Soutenance) 3 CP				

3.2 The Course Syllabus

The foundational information systems course is taught during the third semester in Basel, Switzerland, and the language of tuition is English. Traditionally, the content of the information systems course covered the following topics:

- Introduction to information systems
- hardware, systems software
- networking and the Internet
- databases
- enterprise systems
- information systems development and management.

This content was restructured into the following topics:

- Introduction to information systems
- IT infrastructure
- databases and business intelligence
- enterprise systems, e-commerce, knowledge management
- computational thinking / programming
- information systems security / ethics.

The framework of the course did not change. It consists of 28 face-to-face hours plus a one hour final exam. The course is taught in two groups of between 30 and 40 students each. The reason behind the reorganization of the course content was twofold: First of all it was necessary to update the previous content (Janicki, Cummings, & Kline, 2013). New developments such as cloud computing, big data, business intelligence, etc. needed to be incorporated into the content. A standard information systems curriculum and especially the foundational course as described by the Association of Information Systems (Topi et al., 2010) was adapted as much as possible. Secondly, the new syllabus included the additional topic of computational thinking and programming. The aim of this part was to teach the students how to formulate a small problem in terms of algorithms (hence “computational thinking”) and then to implement these algorithms using the programming language Python.

### **3.3 Six Lessons of Computational Thinking and Programming Using Python**

Python is a readily available open source programming language. It installs easily and in a few minutes on any computer. Python works on all kinds of operating systems. The technological hurdle to get the programming environment up and running is small. A simple development environment (IDLE) is included and ready to be used immediately after installation. That means that the whole installation process, getting the system up and running, and understanding how to edit code takes very little time. The installation can be carried out as a homework assignment, and then in class the instructor can demonstrate how to use IDLE.

Python has some advantages over other programming languages (such as Java, C, C++) which make it more suitable for teaching novices, such as straightforward syntax, direct error messages through interpretation, and strict indentation (Grandell, Peltomäki, Back, & Salakoski, 2006).

Six out of 28 lessons were reserved for the computational thinking and programming part. The learning objectives of this part are:

- To get an idea of what programming actually is
- to understand what an algorithm is
- to try to solve some simple computational problems
- to learn some basic Python commands.

To kick off the computational thinking and programming part, an already existing program was used to illustrate the mechanism of editing the source code, compiling (or in the case of Python: interpreting) the source code, and executing the code. The program asks the user to input an integer number (such as 42, -246, 0) and converts it into a dual number (a sequence of 0’s and 1’s). In order to understand the algorithm of the program (subsequent division by 2), the execution thread was recorded on the black board. Students learn that the computer only represents 0’s and 1’s. Subsequently, the concepts of source code, compiling (or interpreting), machine code, and syntactical and semantical errors were explained in more detail, followed by some basic Python concept, such as case-sensitivity, naming conventions, variables, assignments, and simple keyboard-input and screen-output functions, such as print() and input(). Thereafter, students started to “get their hands dirty” by editing their first Python code in IDLE (a simple “hello world!” program, as tradition has it).

The next set of Python basics included basic data types, such as strings, integers, floating point numbers, lists, and type casting (data type conversion). This part was completed by introducing integer and floating point operations (such as adding, subtracting, multiplying, dividing, squaring, rooting, and exponentiation). Students applied these concepts by typing Python instructions into their IDLE-editor and then executing the code. Next, program execution control commands were introduced (if-elif-else-statements, while-loops, and for-loops). Basic file I/O (input/output to long-term memory) completed this simple coverage of Python. Small assignments gave students the opportunity to apply the concepts and Python-instructions they had learned. These assignments were:

- Find the larger of two integer numbers that have been randomly input by the user.
- Roll a die (generating integers of 1 to 6) and calculate some statistics (percentage of occurrence of each number after a certain number of runs).

- Using a random number generator to let the computer guess a number between 0 and 100. Program a loop so that the user can take guesses and receive hints to guess higher or lower.
- Taking the height of some students as input, calculating the average height and the standard deviation, and outputting the result.
- Computing an estimation of a square root using the Babylonian method (Guttag, 2016).

Due to time limitations and the purely introductory purpose, we did not go deeper into more advanced features of Python, such as tuples, dictionaries, immutability versus mutability, or graphical capabilities. Nor did we discuss the concept of information-hiding through functions (pieces of code with defined input, processing, and output), the complexity of algorithms, or object-oriented programming. The purpose of this six-lesson exposure to computational thinking and programming was solely that students learn that all a computer does is execute instructions written in some programming language. This unique cycle applies to all software development:

- learning how to formulate a (small) problem,
- developing (or at least understanding) an algorithm that solves the problem,
- coding the solution using a programming language,
- debugging the source code,
- executing and testing the program.

This hands-on programming tuition aims at providing the students with a tactile experience of what information systems actually are: instructions executed on a computer.

Generally, the course instructor demonstrated these programming features live (using a beamer). Students followed the instructor by typing Python commands into their IDLE-editor. Inevitably, this led to difficulties (such as misspelled commands or variables, wrong logic or indentation, etc.), so that IDLE responded with error messages instead of executing the program. Students were encouraged to ironing these problems out. Those who had already proceeded correctly helped those who were still struggling. Eliminating syntactical and semantical errors (debugging) is an important learning experience in that it shows in a tangible way that the computer rigorously executes what it is told to do.

### **3.4 Student Feedback**

At the end of each course, students gave their course evaluation feedback. This consists of a set of predefined Likert scale questions about the course as a whole, the instructor's way of teaching, the course material, etc. In addition, students can write open statements about specific aspects of the course. The class has been taught twice to a total of 127 students. The outcome regarding the programming part was as follows:

- 27 students wrote positive statements about programming
- 7 students wrote critical statements about programming
- 8 students stated that they wished more programming during the class
- 13 students stated that they wish to have more time during the programming part

Some remarks referring to the programming part included the following statements:

- "Python: complicated but interesting."
- "Python: very interesting but still complicated."
- "More exercises with Python."
- "Programming (Python) is very interesting, a technical wonder."
- "Programming was very interesting."
- "Programming was interesting. Speed ok."
- "... good to try programming. Thank you!"

Some of the critical statements read:

- “Programming should be taught slower.”
- “More time for the programming exercises.”
- “More time to practice programming. Overwhelming. Not enough time to try by myself.”
- “Less content, so we can take it a little slower.”
- “Narrow it down to fewer subjects because of the complexity of it all.”
- “Programming does not interest me.”
- “Python was difficult, maybe not needed for our knowledge.”
- “I do not find it necessary for our future in business. In fact really difficult.”

From this feedback, it is not entirely clear whether students want to learn about programming or not. It is however clear that if programming is taught, students need more time for actually solving the exercises. One conclusion is thus that the course instructor needs to provide additional time and more direct support during the class. There seems to be a small group of students who dislike the computational thinking and programming part altogether. However, an even larger group of students thinks that it is a good idea to incorporate programming into the course.

During the last ten minutes of the two courses, the author raised the question of keeping “computational thinking and programming” as an integral part of the course. After some reluctance, about 80% of the students raised their hands. A discussion subsequently developed in which it became clear that the students actually liked the hands-on programming part. This was a strong message, and one that indicates that it is indeed a good idea to teach at least some programming in the introductory course in information systems. It seems to be a valuable experience for the students. However, this content needs to be taught in a way that allows students enough time to work on their exercises and to arrive at this satisfying moment when their program executes correctly.

### **3.5 Learning Outcome**

At the end of each of the two runs a one-hour comprehensive closed-book exam took place, which counted for 100% of the final grade. Grades were given in the French system, which runs from 0 (lowest mark) to 20 (highest mark). The pass mark is 10.0. The exam of the first run consisted of 25 questions, nine of which were related to computational thinking and programming. The results were as follows:

- The average grade for the whole exam and all 66 students was 13.01 (SD 4.04).
- The average grade for the computational thinking and programming part was 14.55 (SD 4.91).

The exam of the second run consisted of 30 questions, eleven of which were related to computational thinking and programming. The results were as follows:

- The average grade for the whole exam and all 61 students was 13.27 (SD 3.56).
- The average grade for the computational thinking and programming part was 15.98 (SD 4.51).

This means that students performed better in the part of the exams that related to computational thinking and programming. They performed significantly worse in the part of the exams that asked questions about the typical information systems syllabus. However, the spread of grades was significantly larger in the computational thinking and programming part. This implies that students learned more from the hands-on programming part of the course than from the conventional lessons – and that the difference in analytical thinking skills among students becomes more apparent in this course element.

## **4. CONCLUSION**

One lesson to be drawn from teaching the programming section is that it is important to give the students enough time and support to apply this newly acquired knowledge. Students’ abilities vary; some of them grasp the material quickly, while others take a long time, and some do not succeed in getting any code to actually run. It is important to provide enough support and time to those who struggle. Ideally, all students should get the short programs running on their own computer. The instructor needs to take the time to introduce the problem, explain how to solve it algorithmically

(on the blackboard), and go through the coding step by step. He or she should sit down with weaker students, appoint advanced students as ad-hoc tutors, allow for enough time, and encourage all students to find their solutions. The goal is not to solve highly complex computational problems, but to provide each student with the unique experience of getting his or her small program up and running.

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# Requirements To The Software For Mathematics Teaching And Learning

Vladimir Nodelman, Holon Institute of Technology, Israel

## ABSTRACT

*Mathematicians were the first to start using computers for applied and scientific purposes. With the advent of computers in educational institutions have arisen attempts to apply them in the teaching of mathematics. Unfortunately, despite of comparative accessibility of computers nowadays, their use in the teaching and learning of mathematics remains notably limited and insufficiently effective. Half a century of such practice allows to clarify the reasons, discover general trends and formulate some recommendations for the development and application of appropriate software.*

*The obvious problem is the heterogeneity of the software. All the software used in the teaching of mathematics can be divided into two categories.*

- *The software, originally created not for educational purposes: general use (e.g. Microsoft Excel), and professional software designed for mathematicians, engineers etc. (e.g. Wolfram Mathematica).*
- *Educational software devoted to support studies of different courses of mathematics (Geometry, Calculus etc.) or for teaching concrete mathematical subjects (small applets/applications).*
- 

*Each of these groups has its advantages and limitations in terms of meeting the needs of teaching and learning, but none of them fully compensates the shortcomings of another.*

*Taking into account psychology and pedagogy of mathematics, along with a comparative analysis of existing software, made possible to formulate the proposed list of requirements.*

*These requirements are implemented in the non-profit author's software VisuMatica, which is used in the lecture to illustrate them.*

**Keywords:** Mathematics, Software, Teaching and Learning, Requirements

# Assessing The Impact Of Foreign Ownership: A Case Of Foreign Direct Investment In India

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Doshisha University, Japan

## ABSTRACT

*This paper examines the effect of foreign direct investment on post-investment performance of firms in India. Unlike previous studies, this paper looks into the focused impact of foreign ownership by comparing the performance change with the domestically owned firms. The central research question revolves around finding evidence about foreign ownership bringing in productivity improvements to the targeted firms. A corollary to the central research objective is to find out whether foreign ownership alters the target firms' financial conditions and exports relative to domestically-owned firms. In several previous studies, the FDI is found to improve output, employment and wages for the target firms. This paper seeks to put these findings in perspectives along with the growing literature on the limits of FDI led gains, that focuses on the repatriated profits restricting the positive impact on the target firm. It also weighs in on the conventional wisdom regarding the productivity-driven FDI and seeks to highlight the financial/non-financial channels through which FDI affects the host countries.*

**Keywords:** Foreign Direct Investment; Firm Productivity; Financial Constraints; Mergers and Acquisitions

# The Reciprocal Relations Among Academic Emotions, Learning Engagement And Academic Performance On Vocational High School Students

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## ABSTRACT

*The present study attempted to examine reciprocal relations among academic emotions, learning engagement, and academic performance of vocational high school students in Taiwan. Nine hundred and seventy-four tenth-grade students participated in this study. A self-report measuring students' perception of academic emotions (enjoyment, hope, pride, anger, anxiety, shame, hopelessness, and boredom), learning engagement (behavior, emotion, cognition, agentic, and sociality) and English academic performance were administered on two separate occasions. Results indicated that : (1) positive academic emotions T1 had direct effects on positive academic emotions T2 ; Engagement T1 had direct effects on engagement T2; (2) Positive academic emotions T1 had direct effects on engagement T2; Engagement T1 had direct effects on positive academic emotions T2 (but not significant); (3) positive academic emotions T2 had direct effects on English academic performance; engagement T2 had direct effects on English academic performance; (4) negative academic emotions T1 had direct effects on negative academic emotions T2 ; (5) negative academic emotions T1 had direct effects on engagement T2; Engagement T1 had direct effects on negative academic emotions T2; (6) negative academic emotion T2 had direct effects on English academic performance (negative); engagement T2 had direct effect on English academic performance; (7) the reciprocal model between academic emotions and learning engagement were fit; and (8) the full model proposed in this study fit with the empirical data.*

**Keywords:** Academic Emotions, Learning Engagement, Academic Performance, And Vocational High School Students

# East Asian Disputed Waters: Emerging Security Threats for Japan

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## ABSTRACT

*Since the end of the World War II Japan is maintaining a pacifist policy with minimum interference in regional and global security issues. Ending the World War II as a defeating nation and declared an aggressor of the War by the Allied Powers Japan primarily relied on the United States for its security while maintained only Self-Defense Forces (SDF). Japan's less concern for its security due to its security alliance with the United States made Japan a leading economic and industrial power in the World.*

*The East Asia has remained peaceful in compare to other parts of Asia and the globe which allowed Japan to exercise its economic development and economic hegemony throughout the Cold War period. However, with changing regional and global scenario the security choke points started to emerge in East Asia. The North Korea's nuclear program, the rise of China tied with its military modernization and the territorial and island disputes at South China and East China seas drifted the region towards a dangerous security zone which can lead the region to a possible instability.*

*Mounting tensions at East China Sea where China is colliding Japan with overlapping claims on Senkaku islands and the Chinese aggressive claims at the South China Sea can bring Japan's interests in jeopardy. Japan and China has a dispute on Senkaku islands. Both countries have naval deployment in the vicinity of these islands and on many occasions, in the recent past, the navies of the two countries have come close to a collision. China has also taken more aggressive position at South China Sea where Japan is not directly involved, however, any Chinese aggression – whether a military action or an overlapping claim – can bring Japanese interests and security under jeopardy.*

*Japan almost has no natural resources and its economy depends on imports. Japan's import supplies pass through the Strait of Malaaca, others moving through the South China Sea and all through East China Sea. Any action by Chinese to block such communication lanes and economic routes can undermine Japan's economy and security. The Chinese buildup at South China Sea may result in its possible military clash with the United States of America and in such case Japan's security, either directly or indirectly, may be at risk. Japan is directly involved in the scenario being developed in the East China Sea where Japan's administered Senkaku islands are also claimed by China. China already attempted unilateral drilling underneath of these islands for natural resources. These islands are believed to be rich in minerals which both Japan and China need in order to boost their economic engines. There have been collisions between Japanese and Chinese navies and strategists predict a possible military clash between two Asian rivals if Chinese aggressive claims and such naval collisions continued.*

*This paper will try to examine the security threats Japan may face by the deteriorating situation in the disputed waters of East China and South China Seas. The paper will also try to examine the factors that can lead Japan's involvement in possible crisis being erupted in South China Sea. The paper will also explore Japan's options to deal with such threats.*

# Graph Processing Using SAP HANA

Mark Hwang, Central Michigan University, USA

## ABSTRACT

*Graph databases have emerged as one of the tools that support new applications in the age of big data. Graph processing is critical in systems where the connections or relationships among data points are the focus, e.g., social networks or recommender systems. Currently, graph processing is available in dedicated graph databases or hybrid systems that combine a graph engine with a relational data store. An assignment using a hybrid system, the SAP HANA, is developed to teach students graph processing using a relational database.*

**Keywords:** Graph Processing, Graph Databases, NoSQL, SAP HANA

## INTRODUCTION

Relational databases have been the core of enterprise systems for the last forty years, supporting applications ranging from sales order processing to supply chain management. In a relational database, structured data are organized neatly into tables made of columns and rows. In the age of big data, however, organizations are inundated with increasingly larger amount and varied data including audios and videos, emails, tweets, and sensor data. The NoSQL market was developed in response to handle unstructured data in various ways; chief among them, key-value pairs, document stores, wide-column stores and graph databases (Yegulalp, 2017). Among the non-relational contenders, graph databases are especially suited for applications where connections among data points are the focus such as finding friends in a social network. In a graph database, data are organized into a network of interconnected nodes. Unlike the relational model where a rigid schema is defined, a graph can be created and modified without a fixed schema (Hurlburt et al., 2017; Robinson et al., 2015). Another advantage of a graph database is traversing the graph or network is extremely fast because all the connections are pre-defined, making it an ideal data store for other applications besides social networking including mapping, route planning and network diagnosis (Mortleman, 2016). Another common application of graph databases is pattern matching that can be readily explored in the connections. The result can be a recommendation to purchase a product or service or an indication of fraud as shown in the Panama Papers case (McKenna, 2016) or a cyberattack (Elhadi et al., 2014).

Many fledgling database vendors currently compete in the emerging graph database market. According to one estimate, over 50 offerings are available (Longbottom, 2016). Major suppliers of relational database systems including Oracle, IBM and Microsoft, have also extended their products by either developing a separate graph server or adding graph processing capabilities to a relational data store. The latter approach is appealing as it allows an organization to leverage its existing database to new use cases that involve graph processing. A hybrid system that combines graph processing with a relational or non-graph database is beneficial as the system scales up and the need for integration of data from different systems arises (Hurlburt et al., 2017). An example hybrid system is SAP HANA. SAP is a leading enterprise software vendor best known for its Enterprise Resource Planning (ERP) products. In recent years SAP developed its proprietary in-memory database known as SAP HANA, which underpins a technology platform that supports real-time enterprise transactional and analytical processing. The underlying data model of SAP HANA is relational, but it also includes a graph engine that supports graph processing (Rudolf et al., 2013). This assignment allows students to practice graph processing using a relational database as detailed in the following sections.

## THE ASSIGNMENT

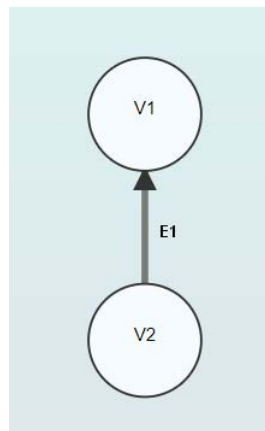
### SAP HANA Graph Processing<sup>1</sup>

SAP HANA has a graph engine that supports graph processing of data stored in columnar tables. A graph is basically

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<sup>1</sup> This exercise is based on SAP HANA Graph Reference.

a network of vertices or nodes interconnected by edges. Vertices represent entities of interest in a specific domain and edges represent their relationships. A simple graph consisting of two vertices and one edge is shown below. In SAP HANA an edge is always “directed”. For example, to record the fact that Mary lives in New York, V2 will represent “Mary” and V1 will represent “New York”. The edge E1 will be “lives in” and will be directed from “Mary” to “New York”. Two vertices can have a reciprocal relationship and thus two directed arrows pointing to each other. For instance, if V2 is “Mary” and V1 is her Instagram pal “Pete,” and they follow each other on the social network, there can be an edge E1 “follows” pointing from V2 to V1 and an edge E2 “follows” pointing from V1 to V2. Both vertices and edges can have properties, facts that are of importance in a specific domain. For example, for people such as Mary and Pete, we may need to know their age and income levels. Similarly, for places such as New York we may need to track properties such as its population, latitude and longitude, etc. We can also record properties of the edge “lives in” or “follows” such as the starting date of the relationship.



An SAP HANA graph workspace can be created to describe a graph, which can then be used to support graph processing of data in response to user query. Common graph processing operations include the shortest path, neighborhood search, and the strongest connected components. Pattern matching is another useful application that allows identification of vertices with similar properties.

This exercise illustrates how easy it is to create a graph in SAP HANA from a vertices table and an edges table. After the tables are created a graph workspace can be created to facilitate graph processing. Just like any tables in a relational database, the graph tables can be modified easily to suit changing user requirements if need be. You will practice the creation, processing and modification of a graph. Sample data is adopted from the Greek Mythology graph data described in the [SAP HANA Graph Data Model](#), which is replicated on the last page of this document. Each vertex in the graph represents a mythological figure and his or her properties including the name, the type of the figure (e.g., god or titan) and his or her residence. The edges indicate the relationships among the figures (i.e., spousal or parental relationships). For each relationship, the source and target are defined, e.g., Chaos has a daughter named Gaia and, therefore, Chaos is the source and Gaia is the target of an edge named “hasDaughter”.

### Section I: Create the Graph

The following SQL code can be used to create the two tables and the graph workspace:

```

CREATE COLUMN TABLE "MEMBERS" (
  "NAME" VARCHAR(100) PRIMARY KEY,
  "TYPE" VARCHAR(100),
  "RESIDENCE" VARCHAR(100)
);
INSERT INTO "MEMBERS"("NAME", "TYPE") VALUES ('Chaos', 'primordial deity');
INSERT INTO "MEMBERS"("NAME", "TYPE") VALUES ('Gaia', 'primordial deity');
INSERT INTO "MEMBERS"("NAME", "TYPE") VALUES ('Uranus', 'primordial deity');
  
```

```

INSERT INTO "MEMBERS"("NAME", "TYPE", "RESIDENCE") VALUES ('Rhea', 'titan', 'Tartarus');
INSERT INTO "MEMBERS"("NAME", "TYPE", "RESIDENCE") VALUES ('Cronus', 'titan', 'Tartarus');
INSERT INTO "MEMBERS"("NAME", "TYPE", "RESIDENCE") VALUES ('Zeus', 'god', 'Olymp');
INSERT INTO "MEMBERS"("NAME", "TYPE", "RESIDENCE") VALUES ('Poseidon', 'god', 'Olymp');
INSERT INTO "MEMBERS"("NAME", "TYPE", "RESIDENCE") VALUES ('Hades', 'god', 'Underworld');
INSERT INTO "MEMBERS"("NAME", "TYPE", "RESIDENCE") VALUES ('Hera', 'god', 'Olymp');
INSERT INTO "MEMBERS"("NAME", "TYPE", "RESIDENCE") VALUES ('Demeter', 'god', 'Olymp');
INSERT INTO "MEMBERS"("NAME", "TYPE", "RESIDENCE") VALUES ('Athena', 'god', 'Olymp');
INSERT INTO "MEMBERS"("NAME", "TYPE", "RESIDENCE") VALUES ('Ares', 'god', 'Olymp');
INSERT INTO "MEMBERS"("NAME", "TYPE", "RESIDENCE") VALUES ('Aphrodite', 'god', 'Olymp');
INSERT INTO "MEMBERS"("NAME", "TYPE", "RESIDENCE") VALUES ('Hephaestus', 'god', 'Olymp');
INSERT INTO "MEMBERS"("NAME", "TYPE", "RESIDENCE") VALUES ('Persephone', 'god', 'Underworld');

```

```

CREATE COLUMN TABLE "RELATIONSHIPS" (
    "KEY" INT UNIQUE NOT NULL,
    "SOURCE" VARCHAR(100) NOT NULL REFERENCES "MEMBERS" ("NAME") ON UPDATE CASCADE ON
DELETE CASCADE,
    "TARGET" VARCHAR(100) NOT NULL REFERENCES "MEMBERS" ("NAME") ON UPDATE CASCADE ON
DELETE CASCADE,
    "TYPE" VARCHAR(100)
);

```

```

INSERT INTO "RELATIONSHIPS"("KEY", "SOURCE", "TARGET", "TYPE") VALUES (1, 'Chaos', 'Gaia', 'hasDaughter');
INSERT INTO "RELATIONSHIPS"("KEY", "SOURCE", "TARGET", "TYPE") VALUES (2, 'Gaia', 'Uranus', 'hasSon');
INSERT INTO "RELATIONSHIPS"("KEY", "SOURCE", "TARGET", "TYPE") VALUES (3, 'Gaia', 'Cronus', 'hasSon');
INSERT INTO "RELATIONSHIPS"("KEY", "SOURCE", "TARGET", "TYPE") VALUES (4, 'Uranus', 'Cronus', 'hasSon');
INSERT INTO "RELATIONSHIPS"("KEY", "SOURCE", "TARGET", "TYPE") VALUES (5, 'Gaia', 'Rhea', 'hasDaughter');
INSERT INTO "RELATIONSHIPS"("KEY", "SOURCE", "TARGET", "TYPE") VALUES (6, 'Uranus', 'Rhea', 'hasDaughter');
INSERT INTO "RELATIONSHIPS"("KEY", "SOURCE", "TARGET", "TYPE") VALUES (7, 'Cronus', 'Zeus', 'hasSon');
INSERT INTO "RELATIONSHIPS"("KEY", "SOURCE", "TARGET", "TYPE") VALUES (8, 'Rhea', 'Zeus', 'hasSon');
INSERT INTO "RELATIONSHIPS"("KEY", "SOURCE", "TARGET", "TYPE") VALUES (9, 'Cronus', 'Hera', 'hasDaughter');
INSERT INTO "RELATIONSHIPS"("KEY", "SOURCE", "TARGET", "TYPE") VALUES (10, 'Rhea', 'Hera', 'hasDaughter');
INSERT INTO "RELATIONSHIPS"("KEY", "SOURCE", "TARGET", "TYPE") VALUES (11, 'Cronus', 'Demeter',
'hasDaughter');
INSERT INTO "RELATIONSHIPS"("KEY", "SOURCE", "TARGET", "TYPE") VALUES (12, 'Rhea', 'Demeter', 'hasDaughter');
INSERT INTO "RELATIONSHIPS"("KEY", "SOURCE", "TARGET", "TYPE") VALUES (13, 'Cronus', 'Poseidon', 'hasSon');
INSERT INTO "RELATIONSHIPS"("KEY", "SOURCE", "TARGET", "TYPE") VALUES (14, 'Rhea', 'Poseidon', 'hasSon');
INSERT INTO "RELATIONSHIPS"("KEY", "SOURCE", "TARGET", "TYPE") VALUES (15, 'Cronus', 'Hades', 'hasSon');
INSERT INTO "RELATIONSHIPS"("KEY", "SOURCE", "TARGET", "TYPE") VALUES (16, 'Rhea', 'Hades', 'hasSon');
INSERT INTO "RELATIONSHIPS"("KEY", "SOURCE", "TARGET", "TYPE") VALUES (17, 'Zeus', 'Athena', 'hasDaughter');
INSERT INTO "RELATIONSHIPS"("KEY", "SOURCE", "TARGET", "TYPE") VALUES (18, 'Zeus', 'Ares', 'hasSon');
INSERT INTO "RELATIONSHIPS"("KEY", "SOURCE", "TARGET", "TYPE") VALUES (19, 'Hera', 'Ares', 'hasSon');
INSERT INTO "RELATIONSHIPS"("KEY", "SOURCE", "TARGET", "TYPE") VALUES (20, 'Uranus', 'Aphrodite',
'hasDaughter');
INSERT INTO "RELATIONSHIPS"("KEY", "SOURCE", "TARGET", "TYPE") VALUES (21, 'Zeus', 'Hephaestus', 'hasSon');
INSERT INTO "RELATIONSHIPS"("KEY", "SOURCE", "TARGET", "TYPE") VALUES (22, 'Hera', 'Hephaestus', 'hasSon');
INSERT INTO "RELATIONSHIPS"("KEY", "SOURCE", "TARGET", "TYPE") VALUES (23, 'Zeus', 'Persephone',
'hasDaughter');
INSERT INTO "RELATIONSHIPS"("KEY", "SOURCE", "TARGET", "TYPE") VALUES (24, 'Demeter', 'Persephone',
'hasDaughter');
INSERT INTO "RELATIONSHIPS"("KEY", "SOURCE", "TARGET", "TYPE") VALUES (25, 'Zeus', 'Hera', 'marriedTo');
INSERT INTO "RELATIONSHIPS"("KEY", "SOURCE", "TARGET", "TYPE") VALUES (26, 'Hera', 'Zeus', 'marriedTo');
INSERT INTO "RELATIONSHIPS"("KEY", "SOURCE", "TARGET", "TYPE") VALUES (27, 'Hades', 'Persephone', 'marriedTo');
INSERT INTO "RELATIONSHIPS"("KEY", "SOURCE", "TARGET", "TYPE") VALUES (28, 'Persephone', 'Hades', 'marriedTo');
INSERT INTO "RELATIONSHIPS"("KEY", "SOURCE", "TARGET", "TYPE") VALUES (29, 'Aphrodite', 'Hephaestus',
'marriedTo');
INSERT INTO "RELATIONSHIPS"("KEY", "SOURCE", "TARGET", "TYPE") VALUES (30, 'Hephaestus', 'Aphrodite',
'marriedTo');
INSERT INTO "RELATIONSHIPS"("KEY", "SOURCE", "TARGET", "TYPE") VALUES (31, 'Cronus', 'Rhea', 'marriedTo');
INSERT INTO "RELATIONSHIPS"("KEY", "SOURCE", "TARGET", "TYPE") VALUES (32, 'Rhea', 'Cronus', 'marriedTo');

```

```
INSERT INTO "RELATIONSHIPS"("KEY", "SOURCE", "TARGET", "TYPE") VALUES (33, 'Uranus', 'Gaia', 'marriedTo');
INSERT INTO "RELATIONSHIPS"("KEY", "SOURCE", "TARGET", "TYPE") VALUES (34, 'Gaia', 'Uranus', 'marriedTo');
```

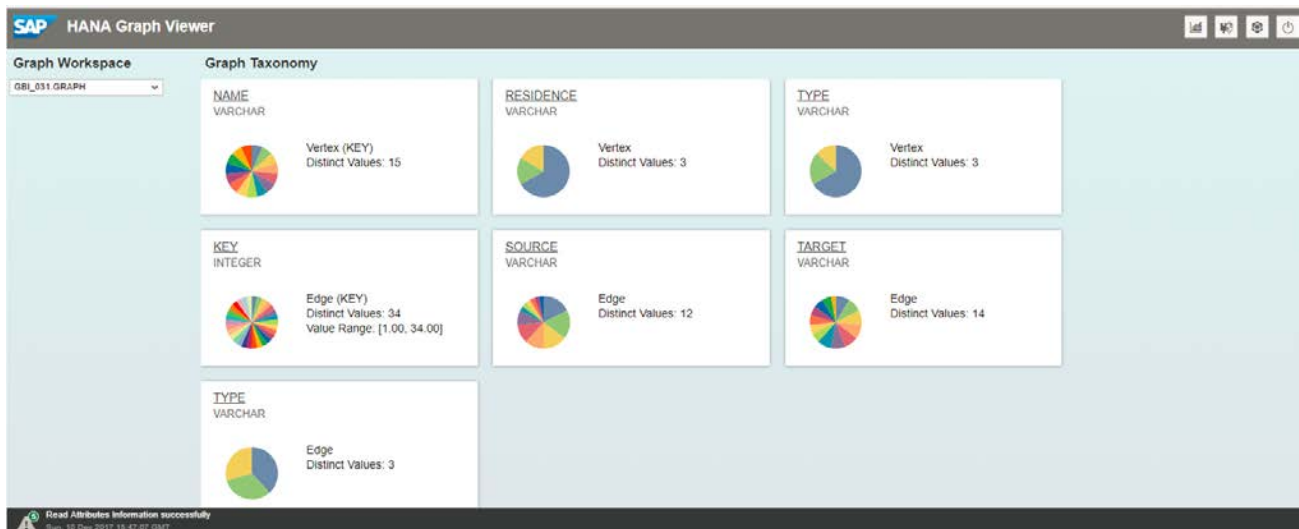
```
CREATE GRAPH WORKSPACE "GRAPH"
  EDGE TABLE "RELATIONSHIPS"
    SOURCE COLUMN "SOURCE"
    TARGET COLUMN "TARGET"
    KEY COLUMN "KEY"
  VERTEX TABLE "MEMBERS"
    KEY COLUMN "NAME"
;
```

To verify that the graph workspace was created successfully, enter the following code and you should see your graph workspace listed:

```
SELECT * FROM "SYS"."GRAPH_WORKSPACES";
```

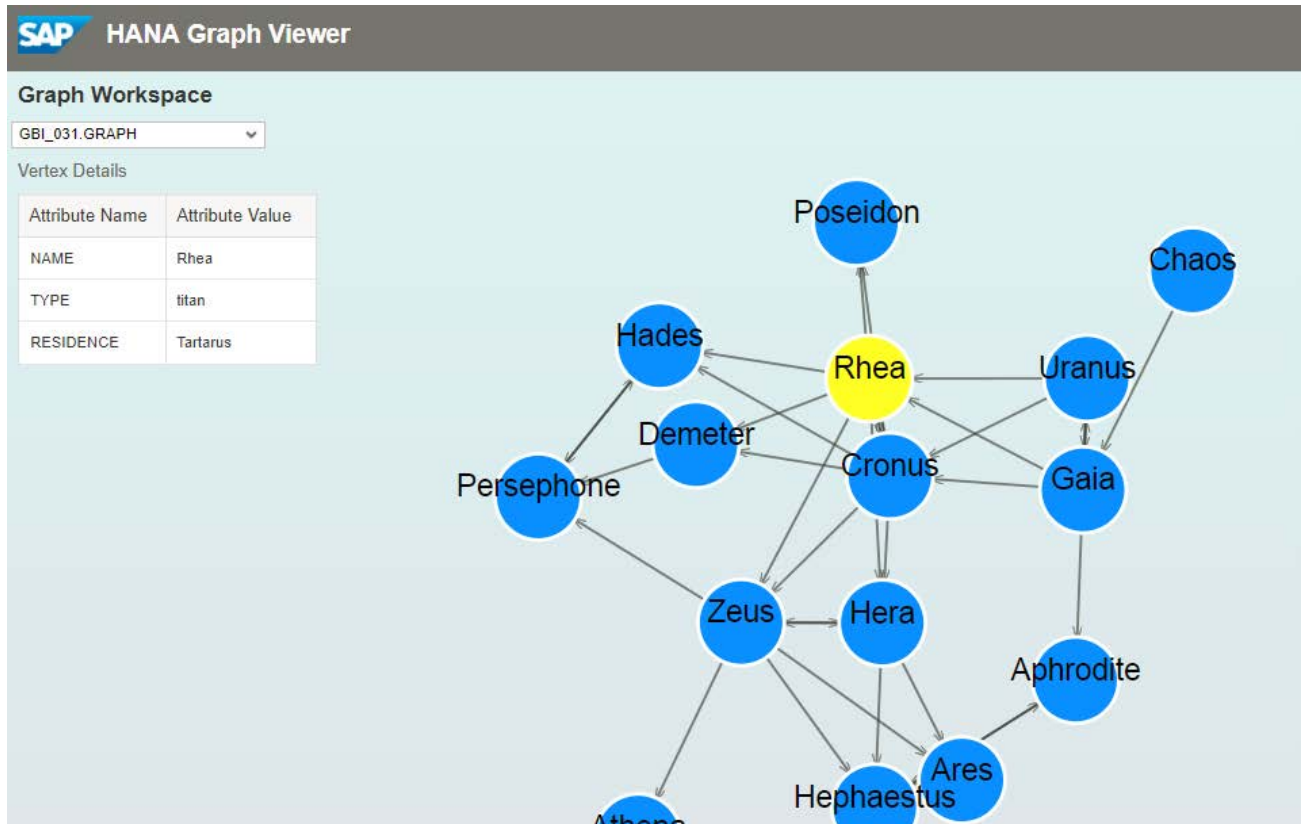
	SCHEMA_NAME	WORKSPACE...	CREATE_TIM...	USER_NAME	EDGE_SCHE...	EDGE_TABLE...	EDGE_SOUR...	EDGE_TARG...	
1	GBI_GRAPH	GBI_GRAPH_DEMO	Mon Sep 19 2016 23:00	SYSTEM	GBI_GRAPH	RELATIONS	SOURCE	TARGET	KE
2	GBI_031	GRAPH	Wed Dec 06 2017 08:50	GBI_031	GBI_031	RELATIONSHIPS	SOURCE	TARGET	KE

Log onto SAP HANA Graph Viewer and select your graph workspace and you should see the graph taxonomy of your graph as illustrated below:



**Section II: Modify the Graph**

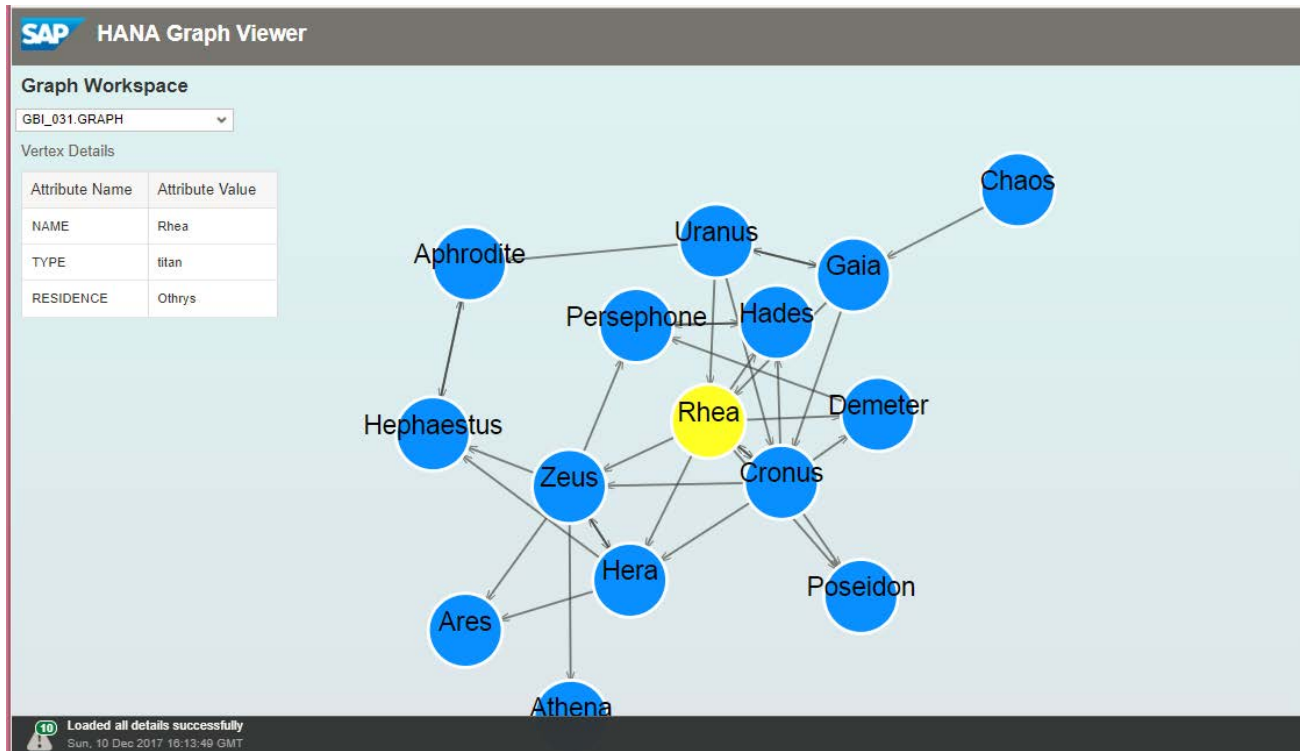
Visualize your graph and see the properties of Rhea as follows:



Change her residence to Othrys using the following code:

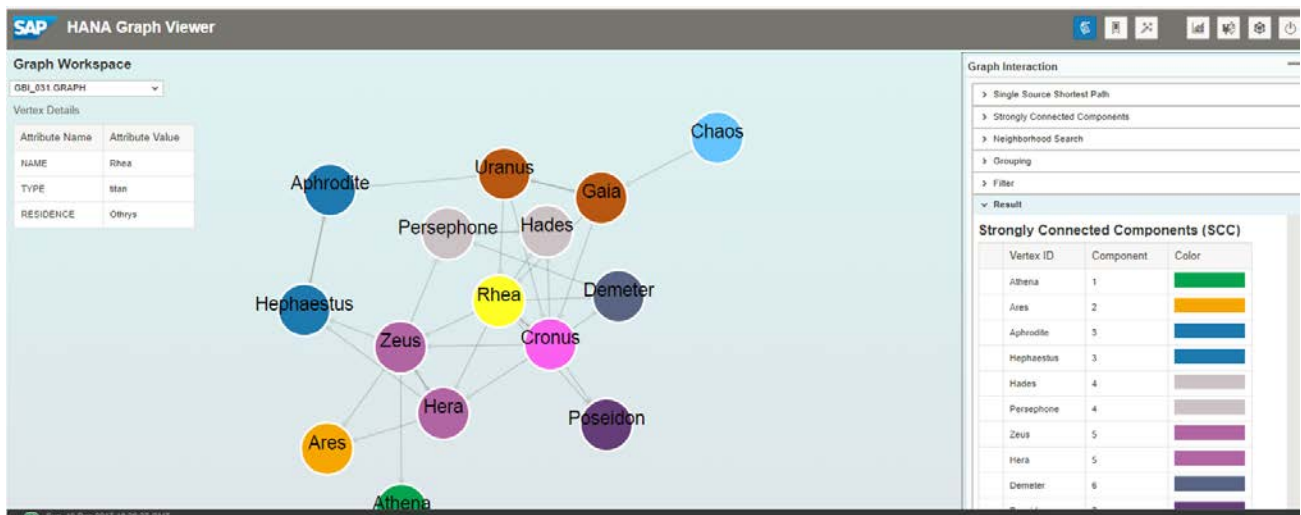
```
UPDATE "MEMBERS" SET "RESIDENCE" = 'Othrys' WHERE "NAME" = 'Rhea';
```

The next screenshot shows that her residence has been changed to Othrys.



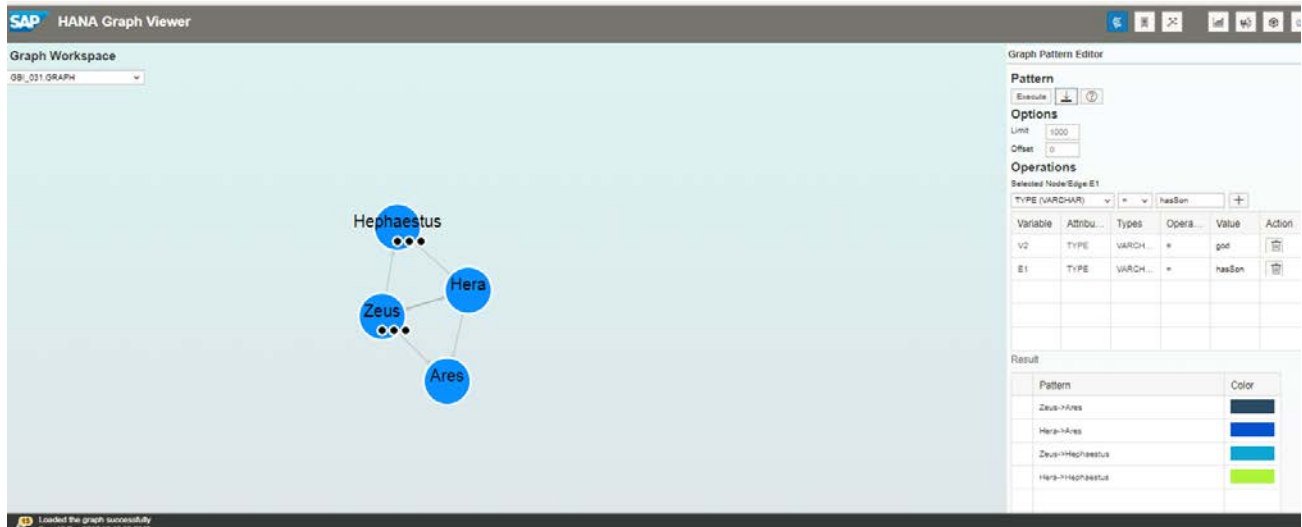
### Section III: Process the Graph

Graph algorithms include the neighborhood search, the shortest path and the strongest connected components (SCC). The SCC can be used to partition the graph into subgraphs where every vertex is connected to every other vertex. Executing SCC in the Graph Viewer will result in the output as illustrated below. The component index represents the subgraphs and vertices with the same index number are connected to each other (i.e., married to each other). See if you can tell the number of couples represented in the graph.



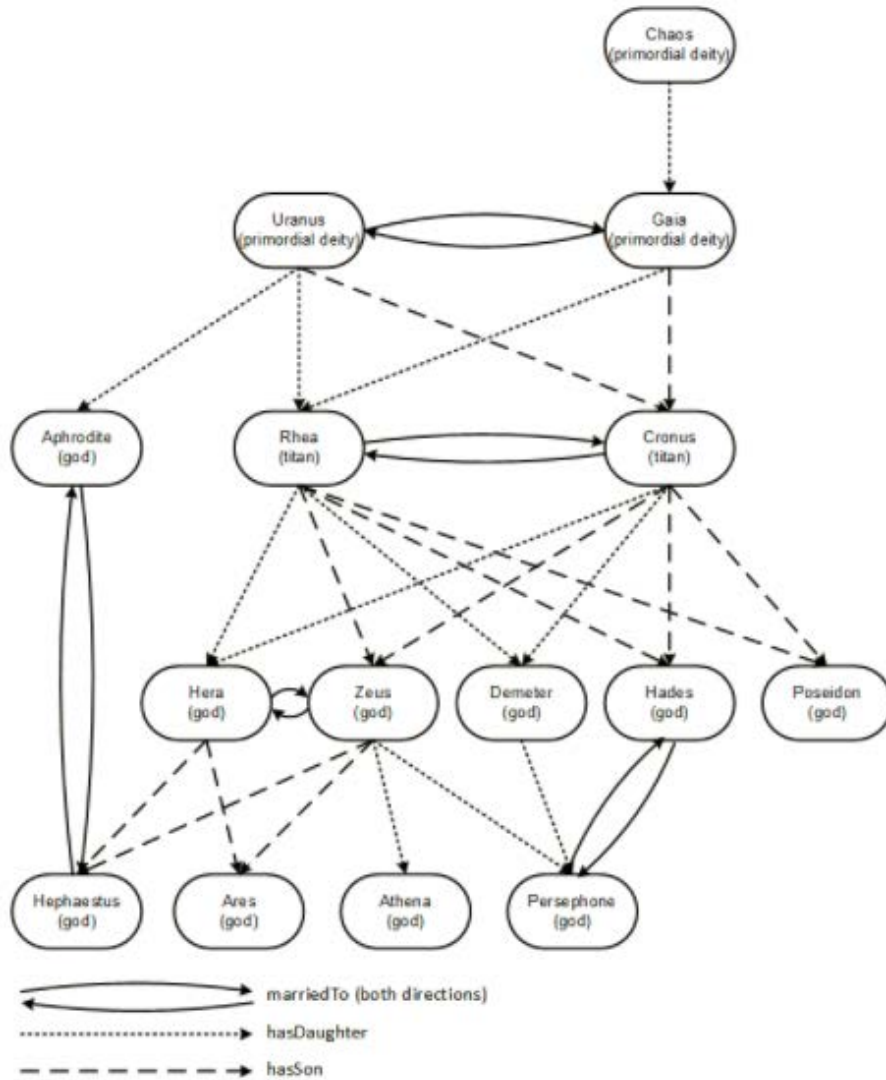
Pattern matching can be used to find vertices with similar attributes. For example, we can find gods that have sons.

The following screenshot shows two gods, Zeus and Hera, with their sons, Hephaestus and Ares.



Your turn:

1. Modify the graph by adding or deleting vertices or relationships.
2. Process the graph by executing a graph algorithm (e.g., the shortest path or neighborhood search). In addition, execute a pattern matching. Explain why this query is important and how it can be used to find answers in other domains (e.g., recommendation systems).



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# Neogene Uplift In The Korean Peninsula Linked To Small-Scaled Mantle Convection At Sinking Slab Edge

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## ABSTRACT

*This study provides quantitative constraints on Neogene uplift in the Korean peninsula using onshore paleo-shoreline records and seismic data. The eastern margin of Northeast Asia including Korea sits in the back-arc system behind the Western Pacific Subduction Zone, a complex trench triple junction of the Philippine Sea, Pacific, and Eurasian (Amurian) plates. An analysis of seismic data in the subduction zone shows that the pattern of uplift in the peninsula mirrors the extent of deep seismicity in subducting Pacific plate beneath. Combined with previous tomographic studies it is proposed that uplift is partly driven by asthenospheric upwelling caused by a sinking slab during the Neogene. In addition, the SHmax orientations of E-W and N-S trends in the peninsula are consistent with the prevailing in-situ stress fields in the eastern Eurasian continent generated by various plate boundary forces. The uplift in Korea during the Late Neogene is attributed, in part, to lithospheric failure relating to faulting movements, thus providing a link between dynamic effects of mantle upwelling at sinking slab edge and lithospheric responses driven by plate boundary forces.*

## ACKNOWLEDGEMENT

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# Practice Of Intellectual Property Products Accounting In Russian Statistics

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In modern knowledge-based economy intellectual property products (IPPs) are considered as one of the most important types of economic assets.

The current methodological basis for IPP statistics are provisions of the latest edition of the System of National Accounts (SNA 2008) representing up-to-date development level of system of accounting indicators which can be used in strategic planning and management. While the main theoretical provisions of the SNA 1993 were retained, in the SNA 2008 the adjustments, mainly related to the methodology of accounting for *innovative components of development of national economy*, were made.

The key innovations in the methodology of the SNA 2008 connected with accounting of economic transactions related to commercialization of intellectual property products include:

- specification of economic content and structure of intellectual property products;
- principles of recognizing the IPP as economic assets;
- methodical approaches to the estimates of IPP components values;
- principles of macroeconomic indicators system formation taking into account the circulation of IPPs in the national economy [1].

The methodology of the SNA 2008 reflected the current situation in the economies of the leading for innovation development countries, where in the last decade trends, related to the increase in the scales of transactions with intangible assets represented by intellectual property products, were observed. The most significant growth in the scales of activity in this sphere in the world economy was recorded by the international statistics after the financial crisis of 2008.

Specific feature of such products is the dominance of *results of intellectual activity* in formation of their cost. The types of intellectual property products specified in international statistics (SNA 2008) are:

- results of research and development;
- results of mineral exploration and evaluation;
- computer software and databases;
- entertainment, literary or artistic originals [1].

Innovations in IPPs accounting serve as a factor that influences on the formation of basic macroeconomic indicators. The main SNA innovations in IPPs accounting that have a direct influence on the formation of basic macroeconomic indicators and require their adjustments are the following:

- changes in definitions and classifications of groups of assets represented by intellectual property products;
- changes in the methodology of accounting for individual types of IPPs;
- accounting the cost of transfers of ownership rights to resident fixed assets in the investments in fixed capital.

The general principles of adjusting basic macroeconomic indicators, including GDP and national income, are based on accounting of intellectual property products as *capitalization objects*. At the same time, IPPs costs are interpreted as expenses related to investments in fixed capital, and intellectual property products are treated as economic assets in accordance with their key characteristics - the property rights, use in the production process and long (more than one year) period of their use in production process.

Theoretically, adjustments to GDP related to the circulation of intellectual property products in economics can be implemented at the level of system of general macroeconomic equations for calculating the value added on the basis of *production and final use methods*. The content of adjustment procedures in this case - redistribution of elements related to intermediate consumption of R&D into accumulation elements and their accounting as fixed capital.

The most significant adjustments of macroeconomic indicators are related to innovations in accounting of research and development (R&D) expenditures. In the new version of the SNA methodology such innovations are applied to accounting principles for the following components:

- expenditures on the R&D acquired by commercial institutional units, non-profit institutions serving households (NPISHs) and general government sector organizations for own use, which are classified as investment in fixed capital and the depreciation of these assets is treated as *consumption of fixed capital*;
- expenditures of general government sector institutions on R&D, which are considered as *investments* in fixed capital and the depreciation of these assets is also treated as *consumption of fixed capital*.

Other factor taken into account in adjusting the basic macroeconomic indicators are innovations in the principles of assigning R&D results to *specific groups of institutional units* (commercial sector, NPISH and general government) in accordance with economic property rights. Such rights can be spread to the R&D users and units that finance corresponding expenditures on R&D.

In the latter case the relevancy of such approach is determined by the following factors:

- usual partial rights of units that finance R&D to their results and benefits from their use;
- difficulty of obtaining more accurate information on property rights distribution between the units that use and finance R&D on the basis of data from traditional statistical surveys.

Such accounting innovations influence on main macroeconomic indicators including GDP which value will increase by the amount of investments in R&D in the commercial sector and amount of consumption of fixed capital related to investments in R&D in the NPISH and general government sectors.

The corresponding model of GDP adjustment is presented in Figure 1.

### Figure 1. Model of GDP adjustment in R&D capitalization

#### 1. Official GDP

plus

#### 2. R&D performed by commercial sector units for use in own production and R&D for sale

minus

#### 3. Software developed for own use in R&D conducted

plus

#### 4. Consumption of fixed capital for R&D assets of general government and non-profit institutions

equals

#### 5. Adjusted GDP

Item 5 *minus* item 1 = GDP adjustment on R&D capitalization

The most significant adjustments to macroeconomic indicators due to innovations in accounting for intellectual property products are related to differences in the concepts of R&D results recognition. According existing approaches

R&D production costs of the commercial sector are considered as *intermediate consumption* and R&D expenditures of non-profit organizations serving households and general government sector are included in the *final consumption*.

In accordance with new approaches the expenditures of these sectors on R&D are considered as *investments in fixed capital*. At the same time the accounting indicators must be supplemented by consumption of fixed capital indicator for R&D assets, which is also included in the total consumption of fixed capital in the national economy.

Estimates of impact of R&D capitalization on macroeconomic indicators are currently being developed in national accounts only in the statistics of some countries, including the United States of America, Canada, Australia, South Korea etc. Starting from the year of 2013 statistical agencies of these countries have published data on national accounts, developed in accordance with the SNA 2008 methodology, which include data on the R&D sector functioning at the system level. For example, in the United States such developments are carried out by the Bureau of Economic Analysis (BEA), which has estimated the volumes of private sector investments in different types of IPP since 1929. Recognition of R&D as investment and relevant adjustments of macroeconomic indicators provides appropriate quality of investment in fixed capital estimates. In this case the potential users of information have more opportunities to analyze the impact of R&D accounting innovations on the dynamics of key parameters of the national economy development.

Traditionally the information used for adjusting the main macro indicators in international statistics is based on the use of statistical surveys data carried out in accordance with the OECD Frascati Manual recommendations - the internationally recognized methodology for collecting and using R&D statistics [2].

According to this approach special schemes are used as a basis for harmonization of indicators related to the different accounting systems. The composition and sequence of elements in the schemes are determined by the methodology of the System of National Accounts. Frascati Manual gross domestic expenditure on R&D (GERD) indicator is used as initial element in calculations.

The relevant scheme for calculating the *gross output for R&D activity* for the Russian economy in 2016 is presented in Table 1.

**Table 1.** R&D gross output estimation for the Russian economy in 2016 (bln. rub.)

№№	Indicators	Value of indicators
1	<b>Gross domestic expenditure on R&amp;D</b>	943.8
2	(-) Capital expenditures in R&D	70.0
3	(-) Software development expenditures in R&D implementation	7.0
4	(+) Consumption of fixed capital	717.8
5	(+) Income from use of fixed capital (for market R&D producers)	0
6	(-) Other subsidies on production	2.9
7	(+) Adjustment of incompany R&D transfer prices	16.6
8	(+) VAT (IC)	0
9	(=) <b>R&amp;D Gross output</b>	1604.1

The combination of items 4 and 5 in international statistics is defined as *capital services*.

In practice as estimate of *consumption of fixed capital* for R&D assets it is possible to use the depreciation indicator reflected in financial statements of organizations.

*The income from use of fixed capital for market R&D producers* due to the lack of relevant statistical data and relatively insignificant amount (less than 10% of total output) is not taken into account.

The indicator «*Other subsidies on production*» (item 6) in accordance with the definition, presented in the SNA methodology, characterizes the amount of subsidies other than subsidies on products that are receivable by the resident enterprises *participating in production process*. In calculations this indicator was defined on the basis of *total other*

*subsidies on production* (in 2015 for the Russian Federation economy - 281 bln. rub.) and proportion of employed in R&D activities (in 2016 - 0.74 mln.) in the total number of employed in the Russian economy (in 2016 - 72.4 mln.).

Item 7 in the table represents corrective element for adjustment of incompany R&D transfer prices in business sector to the *market prices*. Accounting of this element is based on indicators indirectly characterizing the scales of R&D produced for own incompany use, in particular the ratio between incompany R&D transfers and domestic expenditure on R&D in business sector.

Item 8 in scheme represents the VAT accrued to *market products* in R&D sector. The lack of relevant indicator in Russian statistics and insignificant effect on the final indicator (about 0.3% of the value of R&D gross output) enable its exclusion from the calculation scheme.

The obtained value of gross output indicator for R&D sector of the Russian economy is the basis in calculating of the *gross fixed capital formation* (GFCF) used for GDP adjustments. The corresponding scheme for calculating this indicator for R&D sector of the Russian economy in 2016 is presented in Table 2.

The values of R&D import and export (item 2 and 9) reflected in the balance of payments for technologies as payable and receivable under the category «agreements on research and development» were estimated at the level of 7.4 bln. rub. and 11.0 bln. rub. (Indicators of Science: 2017) [3].

**Table 2.** GFCF estimation in R&D sector of the Russian economy in 2016 (bln. rub.)

No.№	Indicators	Value of indicators
1	R&D gross output	1604.1
2	(+) Import of R&D	7.4
3	(+) Trading margins	0
4	(+) Taxes on products	0
5	(-) Subsidies on products	0
6	(-) Acquired market R&D (for R&D sector)	34.8
7	(-) R&D not expected to provide a benefit	
8	(-) R&D in progress	0
9	(-) Export of R&D	11.0
10	R&D GFCF	1566.0

Table 2 can only be completed for those indicators for which sufficient information is available from national statistics.

Trade margins, taxes and subsidies on products in national statistics are usually developed at the aggregate level for the entire economy. The definition of their components related to individual sectors and types of economic activity requires detailed statistics in the form of input-output tables. Currently in statistics the methodology of construction of such tables is not agreed at the international level. As a result in presented scheme by analogy with statistical practice of other countries corresponding elements were not included in calculations.

*The acquired market R&D* - services provided by outside institutional units and taken into account in the intermediate consumption of R&D sector units (item 6), was estimated on the basis of the ratio of its value to the total R&D expenditures.

In 2016 GDP for the Russian economy according to the Federal State Statistical Service data was estimated at the level of 86.0 trillion rubles at current prices. Adjustment for GFCF of R&D sector leads to increase of GDP value up to 87.6 trillion rubles - 1.9% higher than the level of GDP reflected by Russian official statistics.

Another key macroeconomic indicator used in socio-economic statistics is the *National income*. In the SNA this indicator is defined as the balancing item of the *Primary income distribution account* - the general balance of primary incomes in economics in the current period.

In adjusting the national income the changes in the IPP accounting methodology concern the indicators which components are intermediate consumption, gross fixed capital formation and some derived indicators depended on the adjusted indicators. In the SNA allocation of primary income account with national income as balancing item the corresponding derived indicators are operating surplus (*gross*), *mixed income (gross)*, *taxes and subsidies* on production and imports (Table 3).

For *operating surplus* such adjustments relate primarily to units of business sector, which provide R&D services on commercial basis. In this case the transformation of R&D used in intermediate consumption into gross fixed capital formation (GFCF) will only affect the amount of operating surplus (mixed income), which increase will be observed for units providing *market services*. In SNA this group of units includes all commercial sector units and partly the units of the general government sector and non-profit institutions providing market R&D services.

**Table 3.** The allocation of primary income account

Resource use	Resources
Property income	Operating surplus / Mixed income
Balance of primary incomes / National income	Compensation of employees
	Taxes on production and imports
	Subsidies (-)
	Property income

For units that *provide non-market services* innovations in R&D accounting methodology will not affect the relevant components of national income.

In structuring the total corrective GFCF value in the R&D sector (1566.0 bln. rub.) the groups of economic units of market and non-market R&D production were separated according to the structure of domestic R&D expenditures by organizational and legal forms of corresponding production units. In accordance with the statistical data for 2015 in the structure of domestic R&D expenditures in the Russian Federation legal entities that are *commercial organizations* with share of 44.8% (41.5% - joint-stock companies, 3.3% - limited liability companies) dominated. In addition in Russian statistics the commercial sector includes the legal entities that are «*commercial unitary organizations*» which share in domestic R&D expenditures reached 19.5%. Other specified in Russian statistics structural elements of domestic R&D expenditures related to legal entities are «*non-profit unitary organizations*» (27.0%) and «*organizations without the rights of legal entity*» (8.3%) (Indicators of Science: 2017) [3].

For the whole group of legal entities providing R&D services on a commercial basis (64.3%) the decrease in the value of intermediate consumption amounted to 1005.3 billion rubles, which corresponds to a similar *growth in their operating surplus*.

In this case for this group of units the equivalent growth will be recorded for GFCF indicator, which, in turn, provides an *additional increase in operating surplus caused by the use of capitalized R&D assets*. Such increase in the calculations was determined on the basis of the ratio between the value of gross *operating surplus* (gross mixed income) in R&D activity (in 2016 - 555.3 billion rubles) and R&D fixed assets (2015 - 1499 billion rubles, forecast for 2016 - 1706 billion rubles) (Indicators of Science: 2017) [3].

Given that return on fixed capital in R&D activity is estimated at 0.326 the *additional operating surplus* received by commercial sector units as the result of additional resources use will amount 327.8 billion rubles.

In general the impact of innovations in R&D accounting methodology on gross *operating surplus* for the Russian economy in 2016 is estimated at 1333.1 billion rubles, which provides a similar increase in the corresponding element of SNA allocation of primary income account.

In defining other components of the national income increase, caused by R&D capitalization, the equivalence of GDP and national income growth (1556 billion rubles) was taken into account. Accordingly, *the residual value* of the total increase in the national income, not related to the *increase in the gross operating surplus* in R&D commercial activity

(1566.0 - 1333.1 = 232.9 billion rubles), must be distributed among other elements of national income being influenced by changes in R&D accounting methodology (Figure 2).

The main corrections concern *taxes and subsidies on production*, which balance in SNA is defined as *net taxes on production*. This group of taxes and subsidies includes as elements the taxes and subsidies *on products* and *other taxes and subsidies on production*.

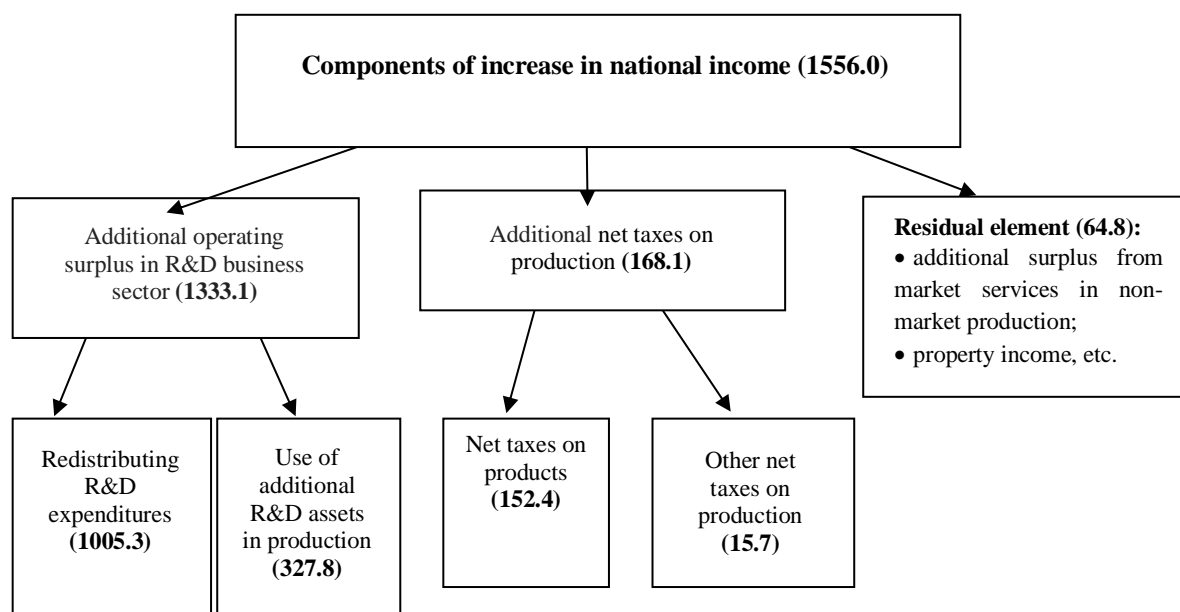
In accordance with the SNA methodology, taxes on products consist of «taxes on goods and services that become payable as a result of the production, sale, transfer, leasing or delivery of those goods or services, or as a result of their use for own consumption or own capital formation». The most common taxes of this type of that require accounting in the SNA for R&D activity are the total sales taxes, excluding VAT and other deductible taxes [1].

*Other taxes on production* consist of taxes on the ownership or use of land, buildings or other assets in production process, as well taxes on labor force or on wage and salaries funds. Other taxes on production are subject to payment by enterprises, *participating in production process*. The object of taxation in this case may be land, fixed capital or labor force, used in production, or certain types of production activities and operations.

The current statistics in Russia does not specify the relevant components for R&D activity in the structure of taxes and subsidies on production. In particular, taxes on products in the SNA statistics are reflected only *at macroeconomic level*. Therefore in calculating the components of taxes and subsidies for R&D activity the hypotheses about the equality of proportions in the structure of taxes and subsidies of this sector to proportions, observed at the macroeconomic level, are proposed.

The main statistical indicator, used in calculations, were other net (excluding other subsidies) taxes on production with a value estimated at 15.7 billion rubles in 2016 in accordance with generation of income account data, relating to research and development sector (SNA) [1].

The main group of taxes on production recorded in the macroeconomic accounting in the Russian statistics are *taxes on products* with total value of 8819.0 billion rubles or 88.7% of total taxes on production and import (9937.0 billion rubles) in 2016. Other taxes on production were estimated at 1118.0 billion rubles (11.3%).

**Figure 1:** Components of increase in national income in the capitalization of R&D in Russian economy in 2016, billion rubles

In the composition of subsidies on production the values of subsidies on products and other subsidies on production according to official statistics in 2016 were estimated approximately in equal proportions, respectively, 54% (284.0 billion rubles) and 46% (240.0 billion rubles).

In 2016 total net taxes on production for the Russian economy amounted to 9413.0 billion rubles, in which net taxes on products and net other taxes on production were estimated at 8535.0 and 878.0 billion rubles, correspondingly. The value of net taxes on products for R&D sector in 2016 was estimated at 152.4 billion rubles extending the corresponding macroeconomic ratio between net taxes on products and other net taxes on production (9.7) on the R&D indicators.

*The residual balancing element* of the system of indicators in the calculation scheme was defined as the difference between the residual value of the total increase in national income, not related to the increase in gross surplus of R&D business sector (232.9 billion rubles), and the sum of net taxes on products (152.4 billion rubles) and other net taxes on production (15.7 billion rubles). This element (64.8 billion rubles) can be interpreted either as an additional surplus gained by units of general government and nonprofit institutions from market R&D, or as error in the calculations amounted about 4% of total increase in national income, determined by the R&D capitalization (1556 billion rubles).

Recognition of R&D as investments and changes in the methodology of accounting of corresponding economic operations lead to changes in constructing some *secondary macroeconomic indicators*, including gross domestic investments by private sector, final consumption expenditures of households and general government sector. Such changes, in particular, result in an increase in the *value of gross domestic investments of private sector* by the amount of expenses on R&D of business and non-profit institutions serving households sectors. *Expenditures on final consumption of households* are reduced due to the assignment of expenditures on R&D by NPISH sector to private sector investments. The expenditures for consumption and gross investment in the general government sector will increase due to the addition of consumption of fixed capital related to investments in R&D.

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# The Effects of Different Imagery Modality Combined with Action Observation Practicing on Improving Golf Putting Performance and Learning

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## ABSTRACT

*Motor Imagery (MI) and Action Observation (AO) have traditionally been viewed as two separate techniques, which can both be used alongside physical practice to enhance the effect on motor learning and rehabilitation. There is clear evidence showing that the respect adoptions of these two techniques can elicit similar activity in the motor system. Building on these well-established findings, research has now turned to investigate the effects on combining one with each other. The purpose of this study was to compare three different types of practicing aims at improving golf putting performance and learning: (a) PETTLEP kinetic imagery combined with action observation and physical practice, PETTLEP visual imagery combined with action observation and physical practice, for the experimental group, and (b) physical practice alone, for the control group. Participants, 51 university students who had no formal experience of using imagery and golf putting, were randomly divided into three groups (PETTLEP kinetic imagery combined with action observation and physical practice, PETTLEP visual imagery combined with action observation and physical practice and physical practice), and they were applied the experiment designs named “different experimental groups with per and post measured.” Participants underwent sixteen times of different interventions twice a week, lasting for eight weeks. We analyzed the received information based on two-factor (group x times) mixed ANOVA to explore the real effect of intervention on participants’ golf putting performance and learning about different PETTLEP imagery modality combined with action observation. After the intervention, we then used task engagement manipulation check, imagery questionnaire and log to understand the extent of golf putt engagement, the condition and suggestion about imagery intervention from the participants. The results revealed that the two experimental groups both are effective on putting performance and learning but not for the control group. PETTLEP kinetic imagery combined with action observation and physical practice are significantly superior to physical practice in golf putting performance and learning. There was no significant difference in the extent to which participants engaged in the putting task and completed their imagery as instructed.*

**Keywords:** Imagery Modality, Action Observation, Motor System

# How to Gamify an EFL Course

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## ABSTRACT

*This presentation will explain how various free-to-use products provided by Google can be used to gamify an EFL course. Gamification refers to the process of applying elements of game design to non-game contexts, products, and services to motivate desired behaviours (Deterding, 2012). Before being applied to educational settings, gamification was being used as an effective tool for businesses looking to engage and motivate their customers. Education-related gamification is about motivating and engaging students by applying game design techniques such as awarding points, badges, and prizes to students for achieving goals, using avatars to represent students on a class leaderboard, and allowing students a choice as to which activities or tasks they work on (Sheldon, 2011). EFL Gamification implementations should be grounded in sound SLA theory with special attention being paid to how certain gamification techniques will affect student motivation. This presentation will first explain what gamification is and outline the relevant motivation theories and frameworks which should be considered for gamification implementations. Then, the presenter will describe how he applied gamification to a university level EFL course using Google Apps as the framework.*

**Keywords:** CALL, gamification, Google, EFL

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# Exploring The Motives And Effects Of Altruistic And Strategic Corporate Giving

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## ABSTRACT

*Corporate giving has evolved into more than altruistic action with strategic considerations. This study draws on philanthropic social responsibility attribution complemented with signaling theory to conduct two experimental studies. We designed two fictitious companies with one more sales-related, tending to take the advantage of social cause, than the other in each study. We chose a remote elementary school and a stray animal shelter as the causes. Our goal is to examine whether the public recognizes the difference between the two and how it interprets such a signal in relation to the firm's reputation, consumer attitude, and purchase intention. The results support the conceptual framework in that corporate giving strategy can be more beneficial when it is more altruistic.*

**Keywords:** Corporate Philanthropy, Altruism, Strategic Giving, Motive Attribution, Experimental Design

## INTRODUCTION

Regardless of successes, academics have long debated the merits of corporate giving and its altruistic or strategic signals. The conclusions appear divergent. Traditionally, economists have asserted that the sole objective of a corporation is shareholders' value, such that corporate giving without shareholders' permission is the same as firm managers stealing from shareholders. Therefore, there is no evident altruistic reason for a corporation to give away shareholders' money purely for philanthropy. However, fewer customers appear to complain about charity-intensive sellers, particularly when they have limited means of assuring quality from sellers who are relatively new, so that consumers respond positively to products tied to charity (Elfenbein et al., 2012); in contrast, companies' vulnerability to public scrutiny drives their giving behavior, and that corporate giving can be both strategic and altruistic (Gan, 2006). Further, volunteer opportunities that fulfill egoistic and organizational citizenship motivations are effective, but that those fulfilling altruistic motives are not significant in increasing the effectiveness of corporate philanthropy (Pelozo et al., 2009).

In seeking the legitimate role of corporate philanthropy, most corporations believe their charitable involvement is strategic, but in fact it is not because it typically leads to reputational improvement and consumer recognition of their brands and products (Porter and Kramer, 2002). Potentially, there is comparative strategic advantage over simply giving to the government or nonprofit causes in altruistic marketing, and that meeting the strategic goal is important (Ricks and Williams, 2005). Scholars have argued that if a firm can manage its key internal and external stakeholder relationships well, it can develop corporate social giving as a more strategically driven process with benefits leading to increased organizational productivity (e.g. Cantrell et al., 2015). Corporate giving has appeared to evolve from an altruistic action to one that is embedded in the strategic frame of management.

This study proposes to prove that corporate giving could be even more beneficial if it were more altruistic. Most prior studies viewed giving as either a strategic or an altruistic avenue. This study questions: For corporate giving, will people detect the strategic essence? Or will they simply view it as a signal of altruism? Either way, how will people associate such a giving signal to the firm's social image?

To answer the question, this study draws on corporate philanthropic attribution complemented with signaling theory (e.g., Connelly et al., 2011) to conduct two experimental studies. We chose a remote elementary school and a stray animal shelter as the causes to exam the propositions.

## THE EXPERIMENTS

Two fictitious companies representing the altruistic and the strategic type of giving in each study were designed. In which, corporate giving: sales-related giving is a marketing-oriented donation in relation to company's sales, and non-sales-related giving offers talents or volunteers as a CORPORATE-giving plan and has no strategic purposes. The responses examined whether consumers distinguished between the two giving scenarios in terms of driven motives, and whether this relationship further impacted their attitudes toward the firm, including firm reputation, consumer attitude, and purchase intention.

### Study 1

Study 1 examined how people attribute the motive for corporate giving. Ellen et al. (2006) suggested that there are three driven dimensions in attribution theory: values-driven, stakeholder-driven, and strategy-driven, to determine the extent to which consumers are likely to attribute a company's motive for social action. Values-driven action is the result of a perceived obligation to help society; stakeholder-driven action is a response to requests from stakeholders such as investors, customers, employees, and social communities; strategy-driven action is the result of marketing strategy or government regulation. So the proposition:

**P1:** Consumers are more likely to see corporate giving as values-driven than stakeholder- or strategy-driven, and be more positive about the firm, if it is non-sales related than if it is sales-related.

### *The Scenarios*

People exhibit different patterns of decision making in relation to information framing, in that different frames may change people's mindsets for decision choices (Levin, Schneider, and Gaeth, 1998). Within the framing, attitude or perception acts as the key factor in explaining people's responses to a firm's activities. We started with two posters introducing the social cause and the giving actions of two fictitious paper/book manufacturing firms, A and B, where we described the giving of Company A as non-sales-related and the giving of Company B as sales-related. Their scenarios are as follows:

Company A values social works and responsibility. Each year, Company A donates books and a thousand Taiwan dollars cash (30 Taiwan dollars = US\$1) to elementary schools in a remote area, and constantly helps the schools to fix damaged classrooms and equipment.

Company B announces a "Buy more, donate more" activity. For any purchase over 30 Taiwan dollars, Company B promises to donate 5% of the purchase amount to elementary schools in a remote area to help them to buy books and to repair damaged classrooms and equipment.



A separate question followed to ask respondents which scenario asked them to purchase a product to confirm whether they recognized the difference between the two scenarios, donating books and cash, or buying to get a donation, as a manipulation check.

### *Findings*

Table 1 shows the respondents' perceived attributions of the two scenarios. Firm A, the one in the non-sales-related giving scenario, had an average values-driven value of 2.25, significantly higher than the overall average (2.14) and the rating of Firm B (1.35). By contrast, Firm B, the one with sales-related giving, had both stakeholder-driven (2.25) and strategy-driven (2.22) values significantly higher than the averages (2.05 and 2.01) and those of Firm A (1.06 and 0.93).

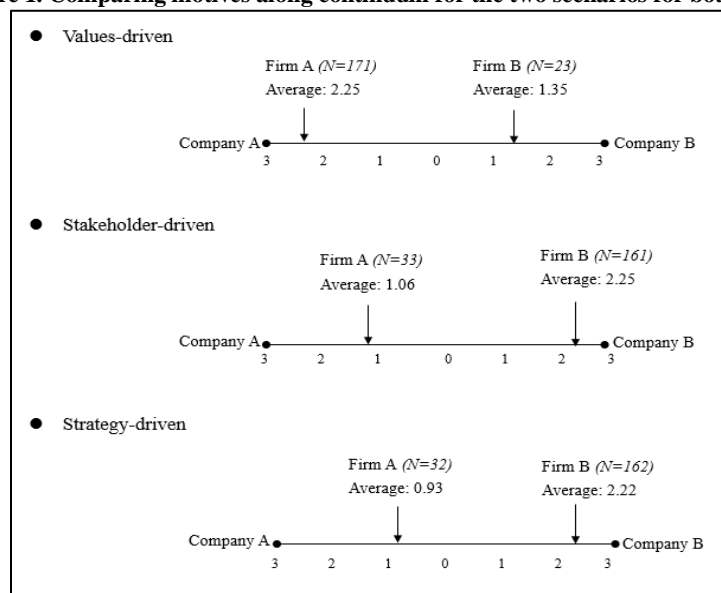
**Table 1. The Average Driven Attribution between the Two Scenarios for Both Firms**

Attribution	Overall Average	Firm A (Non-sales-related)	Firm B (Sales-related)	F-value
Values-driven	2.14	2.25	1.35	376.36***
Stakeholder-driven	2.05	1.06	2.25	458.92***
Strategy-driven	2.01	0.93	2.22	360.79***

\*\*\* p < .001, \*\* p < .01, \*p < .05

Further, there were statistically significant differences in both the ratings and the number of respondents who reported the ratings: approximately 88% (171) reported Firm A as values driven, and approximately 83% (161 and 162) reported Firm B as stakeholder and strategy driven. The significant gaps between the two firms in the three driven scales in Figure 1 show that consumers can distinguish between the two firms in terms of attribution theory.

**Figure 1. Comparing motives along continuum for the two scenarios for both firms**



Equation 1 shows the results of the regression of the three attributions on consumer attitude toward the firm, where \*\*\* means the regression coefficient is significant at  $p = 0.001$ :

$$\text{Consumer attitude toward the firm} = 0.301^{***} \times \text{Values-driven} - 0.345^{***} \times \text{Stakeholder-driven} - 0.319^{***} \times \text{Strategy-driven} - 0.023 \times \text{Gender} + 0.098 \times \text{Education} - 0.012 \times \text{Age} + 0.049 \times \text{social concerns} \quad (1)$$

As the regression in Model 1 shows, the impact of values-driven activity is significantly positive for attitude, while the other two, stakeholder- and strategy-driven, are significantly negative. The effects of personal data, including gender, education, age, and social concerns, were not significant. In addition, relatively, the coefficients of the different signs represent a gap instead of an absolute superior or inferior effect. Together, Equation 1 suggests that companies need to improve the values-driven aspects of their giving plans and reduce the stakeholder- and strategy- driven aspects of them.

**Study 2**

Study 2 explored the relationship between corporate giving and social reputation and whether this relationship impacts consumer purchase intention further. Traditional economic theory asserts that increasing shareholder value is the sole objective of a corporation, such that corporate giving is practically the same as the managers of the firm stealing from shareholders. Therefore, there seem no altruistic reasons for a corporation to give away shareholders' money purely

for philanthropy (e.g., Gan, 2006). On this premise, it is thus natural for consumers to question whether a firm’s motive in corporate giving is simply altruistic. It is easy for consumers to view a well-intentioned cause as a bad idea if they see the cause as concealing self-interest or having a clumsy purpose. Negativity due to unreliable signaling may pose risks to a firm’s goodwill and reputation (e.g., Connelly et al., 2011). Therefore, we have the proposition:

P2. When a firm implements non-sales-related giving, consumers will perceive that it is more committed to social responsibility and rate it higher social reputationally than one that implements sales-related giving; firm reputation as a mediator will impact on consumers’ purchase intention.

*The Scenarios*

In Study 2, we started with two posters introducing the stray animal protection activities of two fictitious pet food corporations, because Mahatma Gandhi, the Father of India, once stated: “The moral progress of a nation and its greatness should be judged by the way it treats its animals.” We framed Company A as non-sales-related giving and Company B as sales-related giving. The scenarios are as follows:

Company A wants its employees to volunteer two hours per week at Stray Animal Shelter, including feeding the animals, cleaning up the environment, and adoption assistance.



Company B announces that if you buy a 15-kilogram bag of pet food, it will donate 1 kilogram to the Stray Animal Shelter under your name. The more you buy, the more you donate.

*Findings*

Figure 2 shows the rating of respondents of altruism or egoism in the two scenario companies. Participants rated Company A, which had non-sales-related giving, at 2.21 for altruism; and Company B, which had sales-related giving, at 2.07 for egoism on average. Apparently, the two companies are at the two extremes of the scale, with a significant gap of 4.28 on a seven-point scale. Thus, these data reveal that the respondents perceive the non-sales giving scenario, that is, Company A, as more altruistic, and the sales-giving scenario, Company B, as more egoistic, or self-centered.

**Figure 2.** Perceived altruism or egoism for the two scenarios

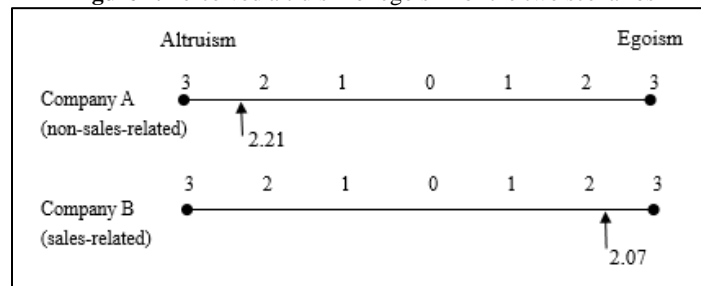


Figure 3 shows the scores of the two firms on social commitment, perceived firm reputation, and purchase intention. The gaps between the two average scores on the three variables are all significantly larger than 4.5, and close to the left and right extremes centered at neutral 0.

Figure 3. Perceived social commitment, firm reputation, and purchase intention for the two scenarios

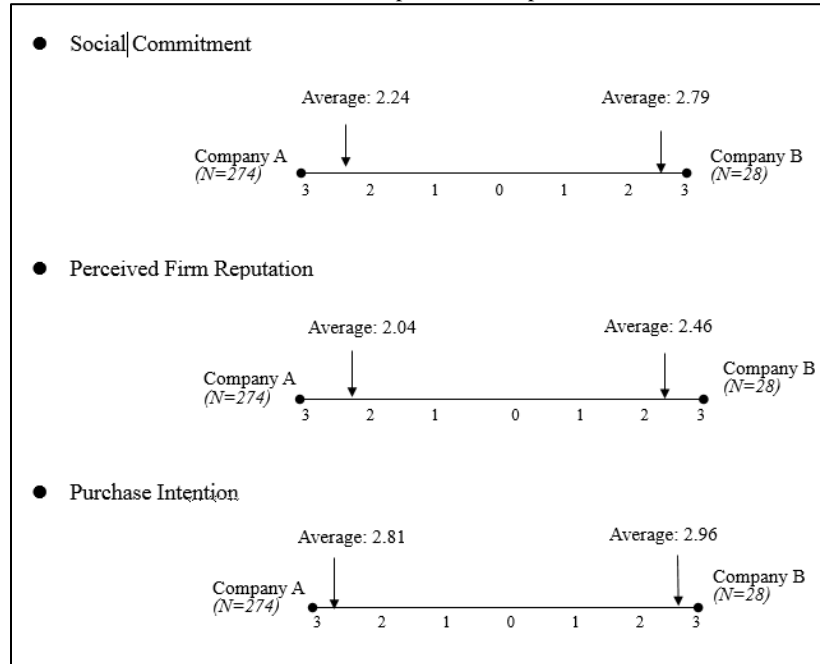


Table 2 shows the mediating of firm reputation on the relationship between social commitment and purchase intention. In which, when competing with firm reputation, the impact of social commitment becomes much weaker, suggesting the mediating role of firm reputation, whether the scenario is sales-related or not. Yet, if rechecking the data in Figure 3, where there were ten times as many respondents (N = 274) agreeing that Company A was CSR committed and reputable, which would prompt them to buy, than for Company B (N = 28), the story appears to suggest that Company A can gain many more customers than Company B.

Table 2. Mediating of firm reputation on relationship between social commitment and purchase intention

	Firm Reputation		Purchase Intention	
	Model 1	Model 2	Model 2	Model 3
CSR commitment	0.695***	0.629***	0.629***	0.197***
Firm reputation				0.622***
Monthly allowance	0.06	0.07	0.07	0.03
Individual concern	-0.08	-0.03	-0.03	0.02
Gender	0.01	0.03	0.03	0.02
Age	0.04	0.01	0.01	-0.01
Education level	-0.03	-0.04	-0.04	-0.02
F-Value	47.688***	30.462***	30.462***	55.313***
R <sup>2</sup> increment	--	--	--	0.180***

\*\*\* p < .001, \*\* p < .01, \* p < .05

CONCLUSIONS

engage in society to bridge management and business ethics research. Economic motives focus on management and performance aspects, such as sales, profit, and return on investment, while duty-aligned perspectives usually adopt ethical perspectives focusing on corporate moral behaviors and the associated obligations to society. Positive duty concerns a firm’s involvement in society to help others, while negative duty means that a company’s motivation for society may be a limited exercise to meet stakeholder expectations. The current values- and strategy-driven findings appear consistent with Swanson’s (1995) motive attribution in the aspects of positive and negative duty. However, unlike Swanson’s mutual economic theory, the stakeholder-driven motive reveals a negative aspect of duty.

Our findings also support Porter and Kramer's (2002) perspective on charity. Porter and Kramer asserted that true strategic charity simultaneously involves social and economic goals, affecting areas where the firm and society both benefit; thus, strategic considerations are simply for publicity, and have nothing to do with strategy or promoting product or brand. Indeed, the mediation test revealed that giving, particularly when it seems altruistic and others-interested, induced consumers to infer the company's credibility and make a positive connection—the more altruism inferred, the higher the credibility imparted to the firm's reputation and purchase intention. However, this positivity is greatly reduced when the firm lets consumers perceive the giving as hidden with a self-interested purpose.

### **Managerial Implications**

To reduce risk and avoid being cheated, buyers look for extrinsic cues of product quality. In response, firms issue signals, including advertising, brands, warranties, and social initiatives. Among these, social-responsibility appears increasingly prevalent, because consumers who lack the ability to determine a product's value before purchasing are more likely to see corporate giving as a positive sign of the firm's honesty and reliability.

The public's attribution of corporative motive is key to the success of corporate giving. Drawing on attribution and signaling theories, this article shows that when a firm implements a non-sales-related giving signal, the public believes that it wants to help society, and so it will be more positive about the firm; while when a firm implements a sales-related giving signal, the public thinks that it conducts the activities because of sales pressure or for reputational capital, and so it is less positive. This may be because consumers believe that a firm that will serve others is more willing to help society without an expectation of gain; in turn, they give it a better reputation, which produces greater purchase intention. By contrast, if it gives consumers the perception that its giving is sales-related, consumers think that the firm is taking advantage of causes or non-profits, and thus they have negative attitudes, harming the firm's reputation and reducing purchase intentions.

Consumers generally prefer altruistic, or non-sales-related social behavior more than sales-centered schemes in corporate giving. This conclusion directly leads to two implications. First, a firm should implement altruistic giving efforts, such as the adoption of volunteer programs, because consumers are more likely to believe that the firm feels obligated to help society without expecting payback, and this in turn generates a good image of the firm. Second, consumers often interpret a firm's social behavior from a subjective, philanthropic viewpoint. Because strategic giving connects charitable behavior to sales-related ideas and purposes, such as sales or product promotion, consumers appear to consider such a firm egoistical and to favor it less.

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# Nursing Students' Attitudes Towards Older People And Future Career Choices In Macao: A Pilot Study

Mei Hua Kerry Hsu, Macao Polytechnic Institute, Macao

## ABSTRACT

*Background:* As global ageing, Macao also faces challenges with regards to an aging population. Not many nursing students are willing to choose gerontological nursing (GN) as a career choice. This pilot study was conducted on a small sample of Macao nursing students to assess nursing students' attitudes towards older people and their future career choices. Moreover, this pilot study is aimed to validate the survey questionnaire for the further study.

*Method:* A cross-sectional survey to explore 30 Macao nursing students' attitudes towards older people and future career choices. Kogan's attitudes towards older people scale (KAOP) was adopted in this study.

*Results:* 33.3% nursing students agreed to work in GN after graduation. Only 6.7% participants chose "aged care institute" as their first choice for future career. Participants have higher mean scores of KAOP that indicate more positive attitudes towards older people. "GN practice experience" and "personal preference" confirmed as factors for nursing students towards GN.

*Conclusion:* Macao nursing students have positive attitudes towards older people but not many of them would choose GN as future career. This study provided knowledge to current nursing educators and government for the situation among nursing students in Macao.

**Keywords:** Nursing Student; Career Choice; Attitude Towards Older People; Gerontological Nursing

## HIGHLIGHTS

1. Ageing society in Macao needs more nurses into gerontological nursing.
2. Macao nursing students have positive attitudes towards older people but not many of them would choose aged care center as future career.
3. "Personal preference" and "Gerontological Nursing practice experience" are important factors among Macao nursing students towards GN.

# Leadership Styles And Growth Strategies: A Conceptual Discussion

Steven Tam, Fort Hays State University, USA

## ABSTRACT<sup>1</sup>

*Objective:* This paper examines how the dominant styles of leaders/decision makers such as CEOs in multinational corporations (MNCs) may be linked to certain preferred choices of strategic expansion for their organization.

*Background:* In the face of globalization, intense competition, technological advances and quickly informed customers, more organizations realize the importance of harvesting new business opportunities to stay ahead by looking to available growth strategies that fit institutional feasibility (the firm) and individual flexibility (the leader) at a given point in time. Despite the fact that organizational growth is always resource sensitive and involves a learning curve for the firm, it is generally agreed that it is worth the effort as the benefits are anticipated to outweigh the costs in the long run. What makes a positive venture happen depends on the adopted growth strategy in line with the potential profits from sales, costs and other support resulted from the new market. While employees play their part in the back scene, senior management is the team (often commended by a leader) who finalizes for the firm regarding how to grow, where to execute, and/or what to offer for a market.

*Methods:* Literature in leadership styles and growth strategies of organizations was reviewed, which lead to the context of this conceptual discussion that fills a research gap. At the current stage, as part of the research design, a two-phase pilot sampling was conducted to explore the researcher's thoughts using an online leadership style questionnaire (Phase 1) and then open-ended interviews through video conferencing (Phase 2) with 17 MNC senior executives in the Asia-Pacific region (who completed Phase 1). The interviews, being one-on-one, approximately 50-60 minutes long, focused on discussing the specifics/importance of growth strategies which they often chose or preferred in the past for the same organization. To understand the leadership styles, the researcher adopted the known Leadership Behavior Description Questionnaire (LBDQ) created by the Bureau of Business Research at the Ohio State University (1957). To make a comprehensive inclusion of growth strategies, the researcher borrowed the classic Growth Matrix proposed by Igor Ansoff (1965). These senior executives were referred to the researcher by his part-time MBA students who are now working for them respectively on the job. While additional sampling is set to continue for this mixed-method research, the pilot test has revealed some initial findings after data synthesis.

*Results:* A conceptual framework bridging leadership styles and growth strategies is emerged.

*Conclusion and Value:* As one of the first studies of its kind, this research puts forward a new body of knowledge about how leadership styles and growth strategies in business are potentially mapped (the conceptual framework). The paper also names two new terminologies for literature – institutional feasibility and individual flexibility in the firm. Little is known about their interaction for organizational growth.

*Implications for Practice:* The conceptual framework contributes to guiding future empirical studies which will practically advance our knowledge about different types of leaders versus different decisions on growth strategies. There are patterns to trace between the two, which may help organizations identify the right-style leader (individual flexibility) to lead them forward more effectively in accordance with the firm's institutional feasibility at different stages of growth agenda.

**Keywords:** Firm Performance, Growing Strategies, Leadership Styles, Multinational Corporations (MNCs), Organizational Growth

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<sup>1</sup> The status of this paper is work-in-progress.

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# Preparing For Disruption: Setting The Scene For A Contextualised Blended Learning Project

Tony Yeigh, Southern Cross University, Australia  
David Lynch, Southern Cross University, Australia

## ABSTRACT

*Introduction: This article reports on an initial pilot study used to contextualise a flipped learning pedagogical approach to blended learning in one school in Japan. The purpose of this pilot study was to set the stage for a subsequent blended learning (BL) project by establishing two teacher skill sets considered important for positioning and contextualising this subsequent project: The school's pre-project relationship with technology as an instructional tool, and the teachers' pre-project understanding of the connections between research evidence and their own teaching. A Teacher as Researcher (TaR) inquiry approach was used to determine the degree to which these skill sets were present within the pilot school, focussing on the teachers' use of and attitudes toward technology, their understanding of evidence-driven decision making as a basis for professional learning and pedagogical change, and defining what a contextualised, high-quality model of blended learning might look like for their particular school.*

*Inquiry Methods: The TaR inquiry participants were 48 teachers in a K – 12 school in Tokyo, Japan. In this inquiry it was important to focus on developing the foundations for a fully blended learning (BL) instructional approach at the pilot school, requiring teacher understanding of how to use technology to drive student-centred learning and how to develop evidence to inform their teaching practices. To accomplish this, a survey, classroom observations and follow-up interviews were used to determine the teachers' attitudes toward and use of technology, as well as their understanding of research and the relationship between research data and their personal teaching.*

*Overall Findings: The overall findings from this pilot inquiry were that although the teachers in this inquiry had generally positive ideas about blended learning and the use of technology to enhance student learning, they were not always clear on just how the use of technology should proceed, nor were they certain about their ability to collect and analyse data in an evidential manner; in order to improve their teaching systematically as an aspect of the blended learning project. The implications these findings have for how to contextualise and position the blended learning project are discussed and clear suggestions for contextualising the subsequent blended learning project are provided.*

**Keywords:** Blended Learning, Educational Disruption, Flipped Learning, Knowledge Economy, School Improvement, Teacher as Researcher

## INTRODUCTION

In terms of technological disruption, the Twenty-first Century is a truly remarkable period in human history. Technological innovations appear to explode onto the market at a daily rate only to be quickly replaced by a new, faster and better version. Take the mobile phone for example: its gadgetry and associated 'apps' illustrates the phenomena of converged technologies quite nicely. Whilst a mobile phone in name, its application far exceeds this generalised designation, to include a video camera, digital camera, global positioning system, thermometer, calendar, compass, calculator, 'e-pad', web tool, diary - and the list goes on. Similarly the motor vehicle, although still designed to take people from Point A to Point B, has a central computer which governs the vehicle such that driving is now supported by all manner of creature comforts and technologically assisted mechanics. Indeed, it appears to be only a matter of (brief) time before even the driver is made redundant and replaced by an auto-drive system.

Such technological advancements exert a fundamental impact on the structure of society in terms of the way people live, socialise, work and learn, a societal circumstance known collectively as the *Knowledge Economy* (OECD, 2013). For teachers and schooling systems this new societal context is both an opportunity and a challenge. It's an opportunity because technological advancements offer alternatives to the traditional 'chalk and talk' classroom learning paradigm and are generating new understandings about how people learn. A challenge because this new context represents a fundamental disconnect from the world in which a generally aging teacher workforce were initially trained, as well as a distinct contrast to the rigid structures of the traditional school and its nineteenth century hallmarks. In this regard the impact of technology has created *educational disruption*, wherein pressure from the Knowledge Economy is pushing against the hallmarks of traditional education, forcing it to change and adapt to the changing circumstances of the world in which it operates (Yeigh & Lynch, 2017).

In this respect it is imperative that societies incorporate the impact of technology in a way that allows education systems to develop an effective understanding of how to professionally develop and improve the quality of teaching and learning in schools, because the future economic prosperity of every nation depends on this to a very large degree (Access Economics, 2005; McGaw, 2008; Rothstein, 2010). This has resulted in calls for schools and other education providers to develop new teaching strategies that incorporate technology in appropriate ways, in order to improve student outcomes and assist a shift to more student-centred learning (AITSL, 2015; Ingvarson, Reid, Buckley et al., 2014; TEMAG, 2014). One approach to incorporating technology into education in ways designed to harness its positive impact involves the use of *blended learning*, a technology-based pedagogical approach we will now discuss as the focus for this report.

### **Blended Learning as a Technology-Based Pedagogy**

Blended learning (BL) is an instructional approach, a pedagogy as it were, designed to increase student-centred, student-led learning via the assistance of technology. It is still developing as a distinct pedagogical format, and because of this does not have a single, universally agreed definition in terms of specific structure or process. However there is general agreement that BL involves some combination of face-to-face (F2F) and online learning elements, and that the main focus for learning needs to be situated within a school setting (Horn & Staker, 2015). Connecting student learning to actual school settings is important because this ensures that the learner's online experience is informing what's happening in the classroom and vice versa.

This general agreement about BL suggests that students are learning via a combination of F2F and online activities, but the underlying assumptions for this are that students will have a degree of control over the time, place, path and pace of their learning, and these assumptions are crucial to the intent of BL as a distinct pedagogy. Indeed, they are what actually characterise BL as a distinct pedagogical approach, as opposed to the role of technology, which some might expect to be the more distinctive element (Willis, Yeigh, Lynch et al., 2018). When understood from this perspective, BL can be seen as a modern pedagogy in which the classroom and online learning elements inform and direct one another in a reciprocal relationship. Importantly, the goal of this reciprocity is to change the fundamental role of the teacher and the student in a manner designed to better differentiate and personalise student learning, that is, to increase student control over the learning that takes place in schools and classrooms.

Student control is a necessary part of BL because students don't all learn in the same way or at the same pace. This is a critical assumption for BL, in that it lays the foundation for student ownership of the learning, a necessary precondition for genuine learner agency. Ownership means that students are empowered with the skills, information, and tools that they need to manage their own learning, providing a sense of personal agency that is essential in order to provide high quality learning. In this respect it is important to understand that student agency is what actually promotes high expectations within a blended learning environment.

### *Flipped Learning as a Foundational Principle of Blended Learning*

The notion of *flipped learning* (generally via the use of a *flipped classroom*) provides a core, foundational principle upon which blended learning is structured. The essential idea for flipped learning is that what used to be done in the classroom is now done online at home, and what used to be done at home is now done in the classroom, so that the teacher can actively guide this part of student learning. Thus, the online components of learning take place in the

home, whereas the learning practice, working through problems, project work, etc., take place in the classroom, where the teacher can be most effective. This concept represents the most common way to implement and support a blended learning instructional approach, and is thus fundamental to the notion of blended learning as a distinct pedagogy.

In this article we report on the initial, pre-project stage of a blended learning (BL) project currently taking place in Japan. The focus for this particular report is on a pre-project *Teacher as Researcher* (TaR) inquiry, used to help contextualise the BL project for a pilot school involved in this project. This inquiry was directed at establishing two important areas of information necessary to prepare for the implementation of BL at the school in a way that allowed the positioning of BL to be more localised and relevant to the immediate school context:

- 1) The school's pre-project relationship with technology as an instructional tool, and
- 2) The teachers' pre-project understanding of the connections between research evidence and their own teaching.

This report thus begins to address several important areas of BL related research, including how to conceptualise BL from a contextualised perspective, how to link teaching to an evidence-based mindset and the need to ensure local relevance for BL related research.

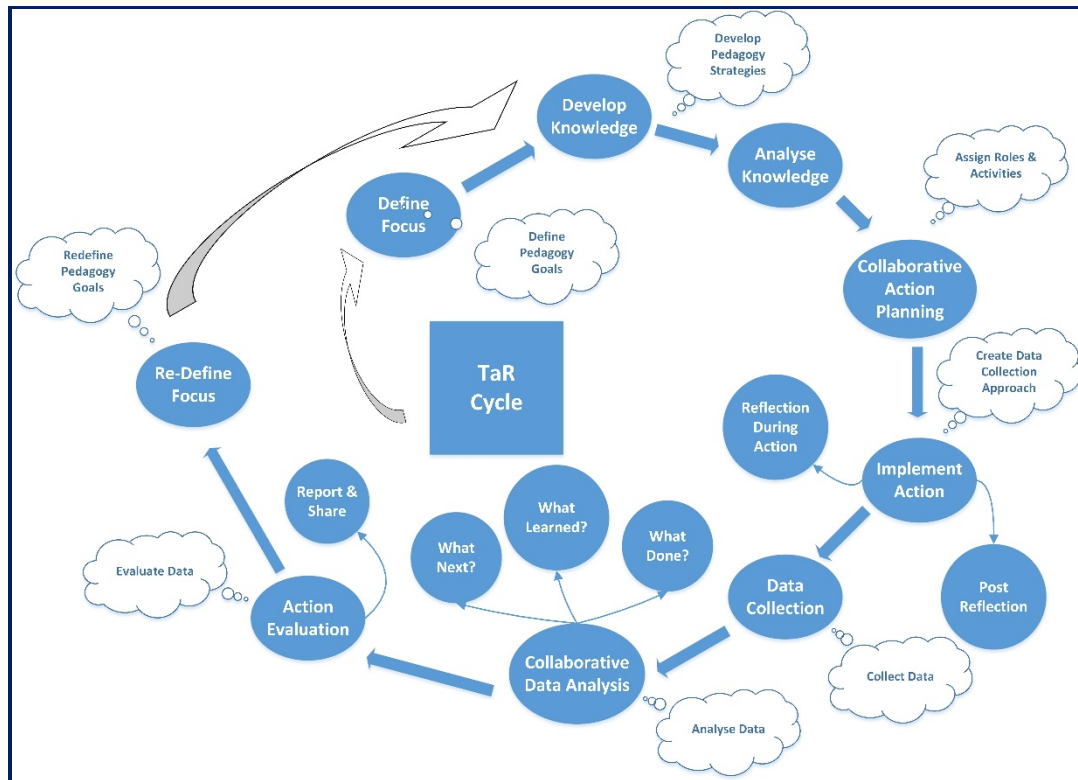
### **Overview of Teacher as Researcher (TaR) Pre-Project Inquiry**

The purpose of this inquiry was to provide a framework for BL, by investigating the key issues that might impact the students, teachers and schools involved in the ensuing BL project. Our objectives for the inquiry were to:

- Develop a collaborative understanding of blended learning
- Provide a relevant background for the ensuing BL project
- Determine the teachers' use of and attitudes toward technology
- Instil a clear understanding of evidence-driven decision making as a basis for professional learning and pedagogical change
- Begin defining what a contextualised, high-quality model of blended learning might look like for a particular school in Japan, based on an inquiry-based learning approach

#### *Blended Learning and Teacher as Researcher (TaR)*

One of the key features of BL as an emerging pedagogy is that it focuses on the relationship between practice and research. This relationship is crucial to the ongoing development of BL as a distinctive pedagogy, because it allows us to evaluate the effectiveness of the pedagogical decisions we make in relation to the practice of BL in schools and classrooms. In this respect how we design BL requires us to make certain decisions regarding how we will implement it as part of our practice, and then be able to evaluate and make judgements about those decisions from an informed point of view. There thus exists a clear need to collect data in relation to these teaching decisions, with data collection and analysis normally viewed as a function of research. A depiction of this relationship is shown in Figure 1, indicating how the different elements of the TaR cycle interact with BL-related data collection in an integrated manner.



**Figure 1:** Overview of the relationship between Blended Learning and the TaR cycle

The use of research as a method to inform our developing understanding of BL is thus highly appropriate whenever we want to assess, compare or evaluate the decisions we have made about how to implement BL as a teaching practice. Generally speaking, we seek to identify the type of relationship that exists between different aspects (often called "factors" or "variables") of a particular situation, in order to determine (say) which teaching strategy works best within a given situation, how one management program might compare against another, which variable (amongst several) exerts the most influence on learning, which model of BL might work better for teaching a particular type of lesson, what type of technology might work best for younger learners, etc. The point here is that a natural correspondence exists between TaR and BL, and there thus exists an intuitive logic to the use of TaR as a foundational skill set to develop in preparation for the implementation of BL, especially in terms of helping to contextualise BL to the specific characteristics of an individual school or group of schools.

## METHODS

### Participants

The participants for this initial, pre-project TaR inquiry were 48 teachers in a K – 12 school in Tokyo. The school had made a collaborative decision to undertake a blended learning project as the basis for their professional development (PD) over a three-year period, initiated by a school-wide implementation of TaR as the prerequisite skill set needed for this project. The mean age for these teachers was just under 40 (39.98 yrs), with an age range spanning 25 – 65 (SD = 11.27 yrs). There were 35 (77.8%) female teachers and 10 (22.2%) male teachers in this cohort, with 24 (53.3%) teachers teaching at the primary level, 11 (24.4%) teachers teaching at the secondary level and 10 (22.2%) teachers teaching at both levels during the inquiry period.

## **Procedures**

In the TaR inquiry it was important to focus on developing the foundations for a fully blended learning (BL) instructional approach at the pilot school, requiring teacher understanding of how to use technology to drive student-centred learning and how to develop evidence to inform their teaching practices. To accomplish this, a survey, classroom observations and follow-up interviews were used to determine the teachers' attitudes toward and use of technology, as well as their understanding of research and the relationship between research data and their personal teaching. Particular information of interest for the TaR inquiry included classroom observations of visible learning taking place, the teachers' use of differentiation, instructional approach, teachers' use of technology, students' use of technology, how the teachers organised their classrooms for learning and how they engaged with students. Open-ended interviews were used to determine the teachers' ability to collect and analyse data and other forms of evidence about their teaching practices.

## **RESULTS**

### **Survey**

A pre-inquiry survey (Appendix A) was used to elicit teacher attitudes, beliefs and perceptions concerning the use of technology in education and the relationship between research data and their personal teaching. This survey was comprised of 73 items, across three different domains that included:

- 1) teacher beliefs and attitudes concerning instruction, student learning, the role of evidence in teaching, the use of technology and assessment (45 items),
- 2) teacher self-rated ICT skill levels (14 items), and
- 3) teacher perceptions concerning the importance of ICT skills to teaching and learning (14 Items).

The pre-inquiry survey was initially developed from concepts and principles relating to Teacher as Research (TaR) and blended learning, as posited in the relevant research literature, and then further refined using focus group discussions that involved academics, researchers, teachers and school executive who had a research background and were working in the area of blended learning. The purpose of this survey was to capture the beliefs, attitudes, behaviours and skill sets of the project teachers relating to TaR and blended learning as aspects of their professional and pedagogical development. All survey items were presented in the form of a statement (e.g., "Students learn more when they search for solutions themselves") and rated on a 7-point scale that ranged from 1 (strongly disagree) to 7 (strongly agree).

### *Survey Findings*

Initial Exploratory Factor Analysis (EFA) for this survey indicated the presence of six sub-factors, including what might be called a "guided discovery" factor (survey items involving teacher-assisted student discovery learning), an "explicit teaching" factor (items involving clear, direct instruction from the teacher), a "digital impact" factor (involving the need for digital technologies in teaching), a "metacognitive, student-led learning" factor (involving understanding student metacognition and the use of differentiation to promote student-led learning), a "teacher collaboration" factor (involving the teacher facilitating student collaboration), and a "student reflection" factor (involving personalised student use of technology, student reflection and student-led collaboration).

All factors exhibited an Eigen value of more than 1, and thus allowed the survey responses to be analysed not only at their immediate item level (teacher beliefs and attitudes, self-rated ICT skills and teacher perceptions concerning the importance of ICT skills), but also at the more implied level of response pattern. At the immediate item level, high average responses (averaging 6 or more) were recorded for the importance of student collaboration (6.2), extending student learning beyond the classroom (6.1), student reflection (6.0), student use of email (6.2), the use of authentic assessment (use of "real world" problems) for student learning (6.0) and the teacher's questioning of student understanding (6.0).

Low average item responses (3.5 or less) were recorded for teacher perceptions concerning the negative impact of digital technologies (3.2), the teacher being at the centre of student learning (3.2), the need for students to memorise facts about their learning (2.3), building instruction around well-structured problems with clear, correct answers (3.5), the teacher's use of closed questioning (2.6) and a perception that blended learning will reduce face-to-face teaching (3.5).

Looking at the interactions between these two levels, important survey findings were that the teachers' self-rating of their ICT skills tended to correlate significantly with the "guided discovery" factor, the "digital impact" factor, the "metacognitive student-led learning" factor and the "student collaboration" factor. These self-rating elements did not tend to correlate significantly with the "explicit teaching" factor or the "student reflection" factor much at all, and in fact displayed negative correlational associations with some of the items involved in these factors.

Overall, the survey results provide a picture of blended learning preparation which suggests mixed attitudes toward technology on the part of the teachers, yet with most teachers agreeing that it is important to use technology to create digital content and to extend student learning beyond the classroom, that student collaboration and reflection is important, that authentic assessment is also important, and that it is necessary to explicitly question student understanding. There was also little support in these findings for the idea that digital technologies would impact negatively on teaching, that the teacher should be central to student learning, or that blended learning in general should be viewed in a negative light. There was also some uncertainty as to the teachers' ability to use evidence to inform their teaching at the item level of analysis, with the item "I base my judgement of student success on student progress data I collect multiple times through each semester" not receiving a high average response overall (5.5) as well as failing to correlate significantly with any of the survey sub-factors.

### **Classroom Observations**

Observational data was also collected on the amount of visible learning taking place, the teacher's use of differentiation, the teachers' instructional approach, teachers' use of technology, and students' use of technology. These observations were conducted by the researchers in conjunction with school executive staff and head teachers, and involved visiting classrooms on multiple, non-announced occasions to quietly observe for the specific activities or behaviours of interest. The results from this data was mixed, but did indicate outcomes in-line with our literature-driven expectations for certain areas (e.g., the use of technology by teachers), as follows:

#### *Visible Learning*

Adapted from the original concept by Hattie (2012), these observations targeted artefacts in the classroom and student/teacher responses to prompts, in order to determine how visible student learning was to an observer. The purpose of these observations was to determine the degree to which students were exposed to active learning prompts and cues, as well as whether or not students were able to articulate what they were learning, why they were learning it, and how the learning connected to what they had learned before. These observations also targeted whether the teacher was able to articulate how student learning tied into their prior learning and/or their subsequent (planned) learning.

Figure 2 displays the observational data for visual learning, and we note that although most teacher observations at the primary level found clear prompts linking student learning to their TaR inquiry area and displaying learning artefacts as attentional learning cues, most secondary teacher observations did not detect this. As well, at both the primary and secondary levels there was little evidence of goal-oriented direction or assessment mapping for students. As baseline data, used to help contextualise the larger blended learning project, this information provided valuable insights in relation to specific areas of development, as examined in the discussion section of this report.

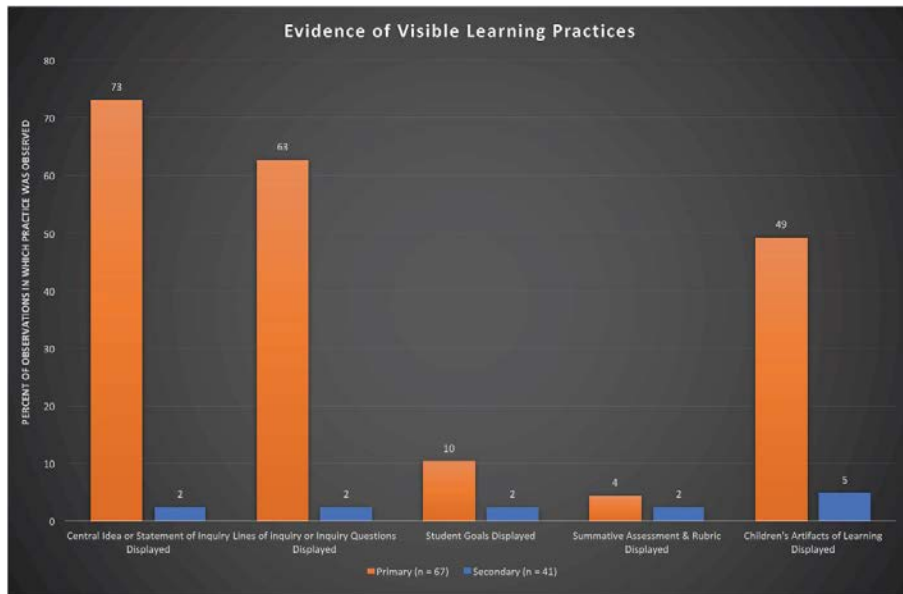


Figure 2: Overview of visible learning for the TaR inquiry

Use of Differentiation

These observations were designed to discover whether all students were being treated in an undifferentiated (“one-size-fits-all”) manner, or if evidence of differentiation could be determined. Important to the intended blended learning project, this could include a variation of path, place and pace for the students. As shown in Figure 3, little difference was found between the amount of differentiation that primary teachers were observed as performing and the amount that secondary teachers were observed as performing. More important, neither primary nor secondary teachers seemed to be differentiating to a great degree, suggesting that a more standards-based approach, or perhaps “teaching to the middle” had been the focus for most teachers at the school.

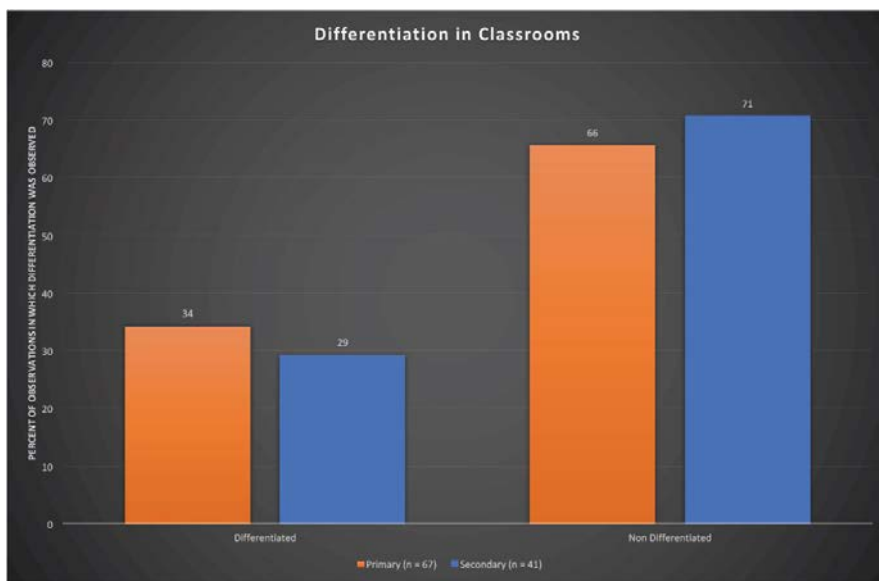
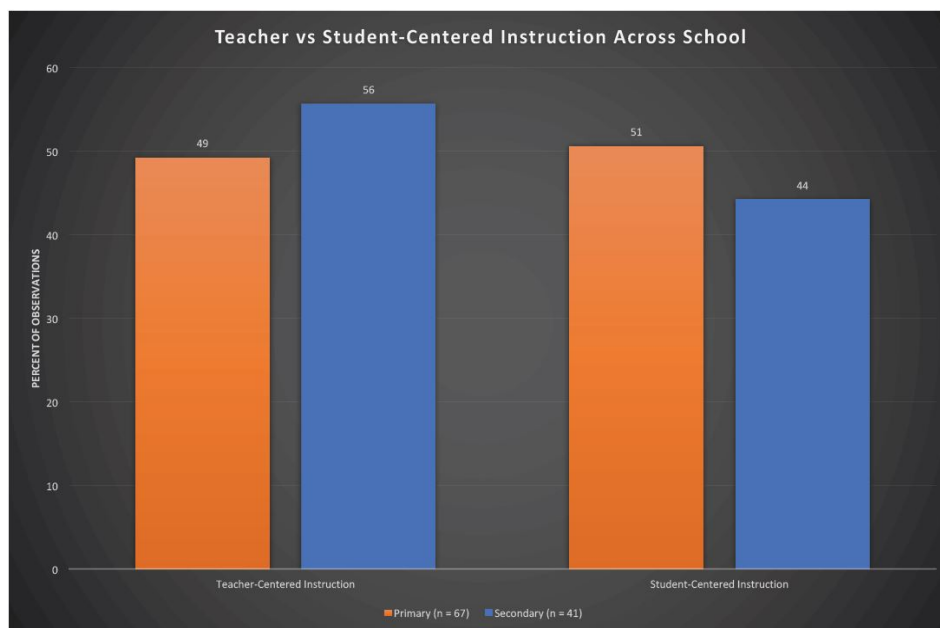


Figure 3: Use of differentiation by primary versus secondary teachers for the TaR inquiry

### Instructional Approach

Was the classroom instructional approach mainly student-centred, with student ownership of the process? Or was it mainly teacher-centred, with teacher directed learning being the norm? These observations looked primarily at whether classroom instruction involved students analysing and questioning their own learning, or the teacher providing analysis direction and questions for the students to respond to. As depicted in Figure 4, these observations indicated that the instructional approaches for the primary teachers were about half-and-half in this respect (49 teacher-centred observations versus 51 student-centred observations), with secondary instruction observed as being somewhat less “balanced” in terms of instructional approach (56 teacher-centred observations versus 44 student-centred observations).

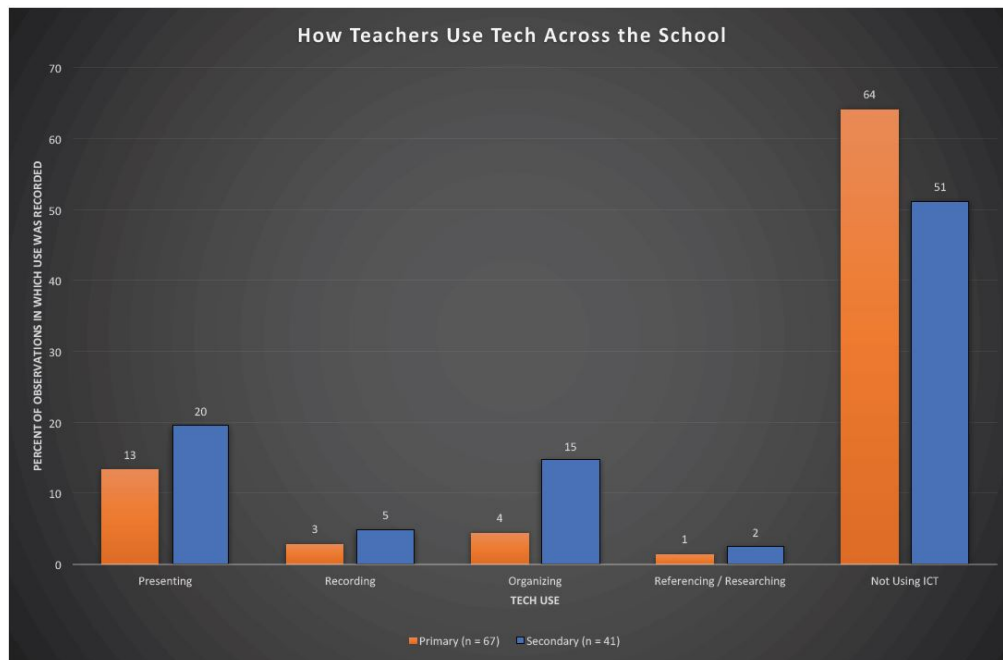
The use of differentiation is a core instructional goal for blended learning, and thus the main “take-away” from this set of observations was that a focus on the importance of differentiating instruction would be an important goal for any Professional Development (PD) program that was to be delivered in relation to the blended learning project set to follow-on from the TaR pilot study.



**Figure 4:** Teacher versus student-centred instruction for the TaR inquiry

### Teacher's Use of Technology

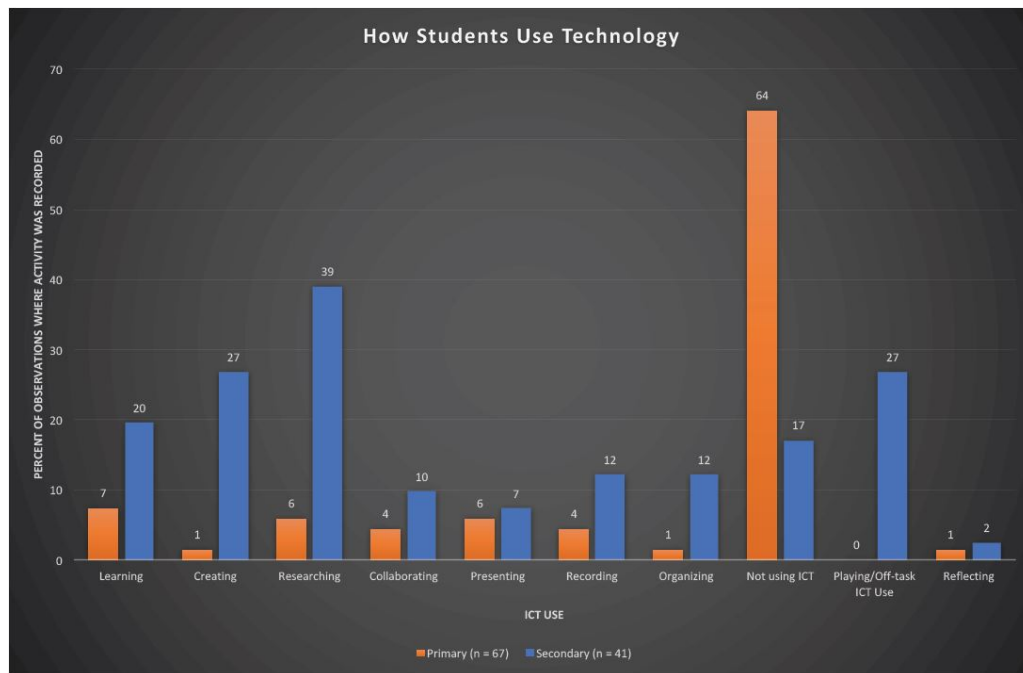
These observations looked at the teachers' use of ICT technologies in relation to teaching and learning. In this respect Figure 5 reveals that although some teachers were observed to be using ICT to present information, organise information, record information, create information and find information for purposes of referencing and/or research purposes, the majority of both primary (64) and secondary (51) teacher observations did not reveal any ICT use at all. This is considered an important finding from the TaR inquiry observations, because blended learning as an instructional approach has a clear dependence on the use of ICT to drive the teaching and learning process. In this respect the lack of ICT use on the part of most teachers calls attention to the need to develop some sort of ICT skill audit for the blended learning project which was to come, in order to ensure that the teachers and teaching teams in that project would know which particular ICT areas and skills were their strengths, and which ones they needed to develop more.



**Figure 5:** Teachers use of technology for the TaR project

### *Students' Use of Technology*

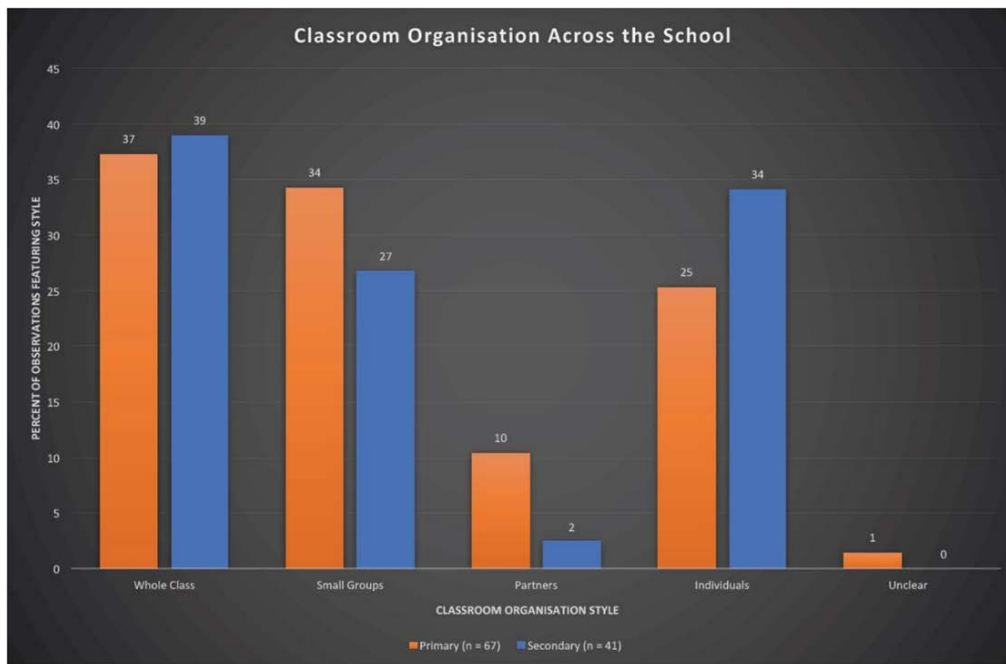
Similar to the teachers' use of technology, observations were also made for student's use of ICT technology during the TaR inquiry. As shown in figure 6, students were observed to use ICT to do many of the same things that teachers used it for, including to record information, create information and organising information. However they were also observed to use ICT in the form of educational applications as part of their learning, to perform research tasks, to collaborate with one another and to reflect on their learning. Also, and unlike the teachers, here we can see distinct differences between the primary and secondary levels with respect to ICT use, with secondary students tending to use ICT a fair bit, while almost two-thirds (64) of the primary student observations didn't reveal any ICT use at all. Interestingly, 27 of the secondary student observations noted ICT use for non-learning purposes, in the form of students playing a game or using ICT to distract (You Tube, Spotify, Instagram, etc.). In this respect there appears a notable difference concerning how technology is being used by many secondary students in the pilot school, with elements of play, distraction and perhaps "infotainment" adding to the students' use of ICT within – or perhaps alongside – the teaching/learning process.



**Figure 6:** Students use of technology for the TaR project

### *Classroom Organisation*

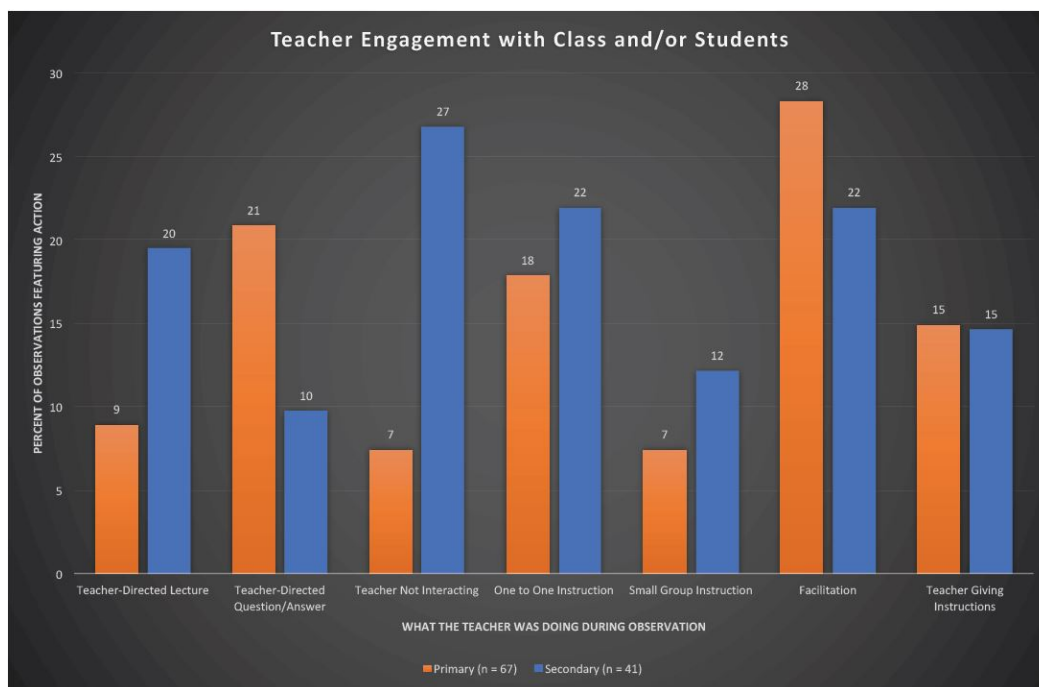
Observations were also made concerning how the teachers organised students for learning in their classrooms. Classroom organisation is considered important for blended learning (BL) because it can relate to the specific model of BL that is used by a teacher (e.g., rotation model, flex model, etc.). In this respect we were interested in knowing whether teachers were organising learning around whole class participation, the use of small groups, partnered learning (peer-tutoring, reciprocal conversations, etc.) or the use of individual instruction. Figure 7 displays the findings from these observations, and note that for the majority of them both primary (37) and secondary (39) teachers were seen to be organising for whole class learning activities. There was also considerable use of small group organisation by primary teachers (34), but this was in contradistinction to the secondary teachers, who were observed organising for individual learning at the same level (34). There is “space” for each of these organisational strategies within blended learning (BL), so the issue with respect to classroom organisation is not what might be “best” practice in general here. Rather, we conducted these particular observations in order to lay the groundwork for teacher awareness of the relationship between classroom organisation and the different models of BL, so that the teachers would be better positioned to use classroom organisation intentionally as part of their involvement with the forthcoming BL project.



**Figure 7:** Teachers' use of classroom organisation for the TaR project

### *Teacher Engagement*

A final area of teacher observations involved monitoring how the teacher was engaging with her or his students. A variety of teacher-engagement activities were observed in relation to this, including the teacher being observed delivering lectures, using teacher questioning, providing both small group and individual instruction, giving direct, task-related instructions and providing learning facilitation (responding to student queries). A lot of these outcomes could be viewed as logical in that they seem to correspond to developmental differences that exist between primary and secondary learners, for example a greater use of lectures at the secondary level (20), more one-to-one instruction at the secondary level (22) and greater use of teacher-directed questions at the primary level (21). There is also an intuitive logic to the finding that many more secondary teachers (27) than primary teachers (7) were observed as not interacting at all with students during these observations. Similar to the use of classroom organisation, however, teacher engagement needs to be contextualised in relation to a specific BL model and learning task, and thus the purpose of these observations was to position the subsequent BL project in terms of teacher awareness of how they were engaging with students at an intentional level, in order to enable greater control over their use of engagement as an aspect of the BL project when it began.



**Figure 8:** Teacher engagement for the TaR project

## Teacher Interviews

Team-based semi-structured interviews were used to inquire about teachers' experiences connected with being involved in the TaR inquiry project. The structured part of these interviews included three questions designed to elicit how the teachers' initial ideas/beliefs about Teacher as Researcher (TaR) may have changed over the course of their involvement with the TaR inquiry, how their initial feelings about the TaR process may have changed over the course of this involvement, and how their involvement with the TaR inquiry had affected their teaching practices. The following are representative of the scope of teacher responses to each of these structured questions (note that many of the teachers are not fluent in the English language, and thus some mistakes in grammar and syntax are evident in the following for this reason):

**Structured Interview Question 1:** How have your initial beliefs/ideas about your TAR topic changed over the course of conducting your research?

- The objective has become clearer as time has gone on.
- It defined some of the key terms we used during our research, and it polished my understandings of these terms as well as how these are used in the MYP assessment.
- Not really, I think that originally I thought the process would be more powerful but I now know that it is mostly about delivery and support when working through it with the kids. I knew this at the start but maybe to a lesser extent. It has now really been confirmed.
- They have become a bit negative. While I still see the value in it, and I do some benefit for some learners, the overall benefit seems minimal. Also data collection can be a bit problematic as the elimination of variables is challenging.
- Before the TAR started, I had a fixed idea about how creativity could be taught. Now I can see how I should trust more on my students' input and how I can empower them.
- I have come to view the improvement of creative thinking through questioning as a much more technical process than I originally anticipated. For example, lateral, convergent, and divergent thinking all work on different facets of this skill.
- As I do the research, I increasingly feel that this is a very relevant topic for kinder. I had thought initially

that the topic would be related only to technology but I find now that through this research I am able to look at different aspects in the class through the lens of collaboration.

- My interest grow more as we start collecting students' data.

Structured Interview Question 2: How have your initial feelings about the TAR process changed over the course of conducting your research?

- I feel that my confidence grow as we discussed and implemented the TAR tool that we developed and became clearer of our goal.
- Despite my frustration, my opinion has improved. While my research is not truly beneficial, it has uncovered other areas of potential improvement in my pedagogy and class management skills.
- It was daunting at the beginning but now the results are beginning to reveal themselves.
- It remains a viable vehicle for professional development and awareness of best practice.
- I wanted to have much more concrete results for both my students and for myself. However, the research development is much more like a eastern medicine that takes time to develop the ideas not only for the teacher's perspectives, but for the young learners especially. So, I am hoping to make this as my long term goal even after the TAR is finished.
- It has reinforced the need to know your students.
- Through my research, I change my idea as for creating the ideal process of learning rather than accepting a former research idea about blended learning.
- Through research my feelings have changed about how I structure my lessons, how I organise homework and summative tasks on managebac.
- It is an important tool.
- I feel more responsible.
- Initially the criterions, the flow of the research itself, was not clear. But over time clarity was established.

Structured Interview Question 3: How has your teaching practice changed over the course of your TAR project?

- It has changed in a sense that I can do the running records with a use of technology rather than the conventional pen and paper.
- I think that I am now far more aware of how I deliver and support the content, concepts, and processes in my lessons. While I already knew this was really the key, as a teacher I tend to kind of forget at times and get swept up in admin and other stuff.
- Becoming more in tuned with the effects of grouping in both short and long term learning situations.
- I am more aware of and focused on the students' perceptions and I am better able to get the students to think about their audience when they produce work.
- It is not changed a lot, but students and I agree to use several ways to organize their learning materials. My teaching practice has changed easier for me.
- I am more aware of the students behaviour, it makes me think and observe them more in a more intentional manner, like focusing on how they are cooperating and being more emphatetic to others.
- I am more aware of analysing exactly why the students are unable to be as effective as I think they should be, and giving them the tools to be successful.
- We've begun to use technology more often than before.
- I have become slightly more open towards using ICT in class.
- I am now a devout believer in explicitly teaching our TAR topic and the process of being a teacher as researcher in the future.
- My teaching practice has changed as I now have a much bigger focus on 'Organisation and Communication' in Grade 6 and this is a on going conversation I have with the kids everyday. It has also helped me in my other subjects to be better organised as a teacher. For example; I spoke to the kids about what can teachers do to help you be better organised and the main response was put EVERYTHING on managebac and send reminder emails.
- We have included more collaboration activities during the lessons.

## DISCUSSION

Blended learning (BL) is a technology-based pedagogical approach aimed at responding to the impact of technological disruption from a knowledge economy perspective. In this respect BL seeks to re-align education as a knowledge economy process, in relation to the educational disruption that is forcing change and adaptation upon the concepts and principles of traditional education. A foundational principle for accomplishing this re-alignment is the use of flipped learning, but due to the currently broad understanding of BL this principle requires contextualising in order to be effective at the individual school level. The purpose of this report has been to describe how a Teacher as Researcher (TaR) inquiry was used to contextualise and position the implementation of a flipped learning BL project in one school in Japan, by focussing on the school's pre-project perceptions of technology and the teachers' understanding of the connections between research evidence and their own teaching.

The findings of the TaR inquiry were obtained via the use of a survey, classroom observations and teacher interviews, and provide significant direction in terms of how to contextualise the subsequent BL project. In this respect survey findings indicated quite mixed attitudes toward technology on the part of the teachers, yet with most teachers agreeing that it was important to use technology to extend student learning beyond the classroom, that student collaboration and reflection was important, that authentic assessment was also important, and that it was necessary to interrogate student understanding. In turn, there was little support for the idea that digital technologies would impact negatively on teaching, that the teacher is central to student learning, or that blended learning in general should be viewed in a negative light. In addition, there was some uncertainty as to the teachers' need to use evidence to inform their teaching.

Classroom observations revealed that the overall value the teachers placed on technology as a driver of learning in their survey responses, as well as the importance ascribed to being proficient in ICT skills, did not translate into actual classroom practice during the TaR inquiry. These observations did accord with the survey responses indicating teacher value for student-centred learning however, in terms of the relatively high degree of teacher facilitation taking place at both primary and secondary levels, and perhaps in terms of teachers not interacting at all more often at the secondary level of instruction (allowing room for more student-directed learning). Crucial "contextualising" observations were that the teachers were mostly not using ICT at all in their practices and that many students were using ICT for non-educational purposes. The low use of differentiation observed was also important, because the use of differentiation to drive student-centred learning is one of the main goals of blended learning.

Teacher interviews were used to determine the degree to which the teachers' ideas and beliefs about working within a Teacher as Researcher (TaR) framework had changed over the duration of the TaR inquiry, how their feelings about the TaR process had changed, and how all this had changed their teaching practices. The findings from these interviews indicated that most teachers saw a benefit from the TaR inquiry, and had developed a greater interest in using this sort of approach to improve their teaching. Most also suggested that the use of a TaR approach was capable of improving student-centred learning at the school. There was also a general increase in confidence reported in these interviews, involving the need to develop an evidential approach to teaching practice and linking this to an ongoing focus for Professional Development, and in this respect the interview responses suggest a progression of thinking in relation to the role of evidence-driven practice that is different to the earlier survey responses showing uncertainty about the use of evidence in this manner. In terms of changes to teaching practice, most of the teachers had come to embrace the benefits of technology as an organisational tool, as well as using technology to promote student participation and collaboration.

### **Implications of the TaR Inquiry**

The implications these findings have for positioning the subsequent BL project are varied but useful. First, it is obvious that by the end of the TaR inquiry the teachers were beginning to see the benefit of using an evidence-driven format for improving student learning at the school, and this lays a good foundation for incorporating the natural relationship that exists between blended learning (BL) and research into the forthcoming BL project. Another implication is that a clear focus on the development of ICT skills for classroom use will need to form a major component of the BL project, and this should be linked to some sort of ongoing, systematic PD process in order to ensure the uptake of these skills. It is also evident that a greater emphasis on the use of differentiation is needed in the BL project to increase student-

centred learning. In this respect seeking ways to use technology to help increase student-centred learning is also necessary, in order to better promote student control over the time, place, path and pace of their learning.

Overall a strong focus on ICT skills for both teachers and students, an increased use of differentiation and the development of specific data collection and analysis strategies will be needed to position the BL project in a way that applies the principle of flipped learning appropriately to the local school context. In this manner the information gained from this TaR inquiry can be used to situate the subsequent BL project in relation to the student learning and professional development needs of the school in a way that clearly contextualises the BL project for this particular school.

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# Problem Based Learning In A Special Needs Environment

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## ABSTRACT

*Problem based learning is a type of pedagogy where students use applied problems to acquire understanding of subject matter material and improve learning skills. As opposed to traditional teaching methods, Problem based learning involves an active learning approach that is student centered.*

*Although Problem based learning was initially conceived to improve education for medical students by having them use the information they learned to diagnose an illness, Problem based learning has been found to be an effective pedagogical method across fields and levels of education. The questions we research in this paper are: Is Problem based learning effective in the subject of reading and is Problem based learning effective for special needs students. This paper examines the results of fourth grade level STAR tests for special needs students in the subject of reading. The study contrasts the scores (including several indicators of improvement) of students who were taught with Problem based learning as opposed to students who were not.*

## LITERATURE REVIEW

Problem based learning is a type of pedagogy where student use an applied problem to acquire understanding of subject material. Problem based learning is a break from direct instruction, lecture type pedagogy where the subject matter is delivered by the teacher through a face to face style interaction in a sequenced manner. Problem based learning usually involves an open-ended problem where students engage with the material (Winarno, Muthu, & Ling, 2018). Problem based learning involves less structured real world problems (Torp & Sage, 2002).

Problem based learning “empowers learners to conduct research, integrate theory and practice, and apply knowledge and skills to develop a viable solution to a defined problem” (Savery, 2006, p. 12). This method involves giving the students a task, having them interact with the material, gather information, analyze the information and explain what they know (Barrows 1986). The significance of Problem based learning is it involves active learning. It is also student focused (Barrows 1986). Problem based learning can involve devising a strategy to solve a problem and communicating that strategy with other students (Savery, 2006). Essentially, “students learn what they need to know to solve a problem” (Hmelo-Silver, 2006).

Pike et al. suggest Problem based learning, is holistic in terms of learning goals, involves the teachers serving in a consultative role. Students play an active role and takes on real world cross disciplinary problems (Winarno, Muthu & Ling, 2018, p. 77). Gentry states Problem based learning in the student-centered classroom. “Teachers are the channel through which the students acquire the skills for learning... as a prod for students to gain that knowledge on his or her own” (2000, p. 11). Problem based learning is about applying skills rather than learning facts (Gentry, 2000). Students do not necessarily arrive at the correct answers in a linear way.

With Problem based learning, students come to understand the material. Because the problems are complex, students are required to use higher order thinking skills (Wynn and Okie, 2017). “A meta-analysis by Strobel and Van Bareveld (2009) indicated that Problem based learning was significantly more effective than traditional instruction in training competent and skilled practitioners and in promoting long-term retention of knowledge and skills” (Wynn & Okie, 2017, p. 2). Wynn, Mosholder, and Larsen (2014, 2016) also found that Problem based learning, with an explicit metacognitive reflection component, was more effective than traditional instruction in promoting postformal thinking, specifically relativistic and dialectical thinking (Wynn and Okie, 2017, p. 2). Students move beyond pure good or bad

thinking to see connections inconsistencies and contradictions. Also students are given the opportunity recognizing that not every problem will have a workable solution (Wynn & Mosholder, 2016).

Problem based learning originally began in the 1970s as a learning technique for medical schools in Canada (Rhem, 1998). As in medical school, Problem based learning has been similarly used in other graduate and undergraduate programs (Rhen, 1998). Problem based learning is interesting and effective because, like the real world, it is often multidisciplinary (Smith, 2005). For example, in the business setting it is important to have students who are able to work in a collaborative way (Pike, Spangler, & Williams, 2017).

Primary Education has been found to be an appropriate academic level for Problem-based learning (Firdaus, Herman, & Herman, 2017). Furthermore, Kinkaid and Jackson have demonstrated that Problem based learning is an effective pedagogical method for students with special needs (2006). Just as it has Problem based learning has been used for math it can also be used for reading and literature (Sussman 2017).

### **METHODOLOGY**

This study focuses on a cross examination of student scores on STAR test in Reading. Scores that will indicate differences in student achievement pertaining to Problem-based learning and non-Problem based learning, mainly direct instruction. The authors will be evaluating pretest (beginning of the semester of Fall, 2017) and posttest (end of the semester of Fall 2017) data to gauge differences in performances.

The testing scores for Reading include a **SGP** (Student Growth Percentile), **SS** (Scaled Score), **GE** (Grade Equivalent), **PR** (Percentile Rank), **IRL** (Instructional Reading Level).

STAR tests are computer-adaptive tests (CATs), computer-adaptive test continually adjust the difficulty of each child's test by choosing each test question based on the child's previous response. Star assessments can also be used to monitor student growth throughout the year, to estimate students understanding of state standards, and predict student performance on the state test.

**SGP** is a norm-referenced quantification of individual student growth derived using a quantile regression technique. An SGP compares a student's growth to that of his or her peers nationwide. SGPs range from 1-99 and interpretation is similar to that of Percentile Rank scores.

**SS** is useful for comparing student performance over time and across grades. A scaled score is calculated based on difficulty of questions and number of correct responses. Star Reading scaled score range from 0 to 1400.

**GE** is a norm-referenced score that represents how a student's test performance compares to other students nationally. For example, a fifth-grade student with a GE score of 7.6 performed as well as a typical seventh-grader after the sixth month of the school year.

**PR** is a norm-referenced score that provides a measure of a student's reading ability compared to other students in the same grade nationally. The percentile rank score, which ranges from 1 to 99, indicates the percentage of other students nationally who obtained scores equal to or lower than the score of a particular student.

**IRL** is calculated after a student completes a Star Reading test; it is a criterion-referenced score that is the highest reading level at which a student is 80% proficient (or higher) at comprehending material with assistance.

A mean of scores will be determined for students that have been exposed to Problem-based learning and students that have not been exposed to Problem-based learning.

## RESULTS

Non PBL/PBL Average Scores (29 students)

SGP (9 of 29 Students) Median	Test Date	SS	GE	PR	IRL
Non PBL 22	Non PBL	390	3.6	12	2.6
PBL 55	PBL	468	4.2	19	3.2
	Change	+78	+0.6	+7	+0.6

These scores were based on 4<sup>th</sup> grade student performances. The sample was 9 out of 29 students. Problem based learning showed a 33 Percentile-growth increase from the beginning of the semester to the end of the semester in the 2017-2018 school year. Scaled score went up by 78 scaled scores. Grade equivalency increased by .6 of a grade level. Percentile rank increased by 7 percentile rank. Students Instructional Reading Level increased by .6 grade levels.

## DISCUSSION

One teacher at a special education school implemented Problem based learning within the classroom. The scores were taken to show an increase in student performance between 4<sup>th</sup> graders in different classrooms. (Nine students were in one classroom and 29 students were the 4<sup>th</sup> grade as a whole. Thus 20 students did not have Problem based learning prior to the last round of STAR testing). Compared to the other classrooms, the Problem based learning classroom showed increases in student performances. The students took STAR testing at the beginning of the school year (August, 2018) and at the interim of school year, which was in January of 2018. Classrooms that did not utilize Problem based learning showed only a 22 SGP. This means that they only demonstrated a 22 percentile increase which is below the benchmark of 40 SGP. The Problem based learning classroom showed a 55 SGP.

This classroom utilized four project-based learning activities throughout the semester. The activities challenged student across the curriculum utilizing integrated instruction and curriculum. The teacher who implemented Problem based learning utilized integrated themes incorporating literature with research, math, and science, blending criteria to establish more questions to further develop ideas. Also, the students conducted comparative experimentation of ecosystems and theories to encompass living conditions and horticultural effect on stimuli.

The sample are special education students that did not read at grade level at the beginning of the semester. The special education students are serviced in a non public special education school. The school teaches students with emotional disabilities, learning disabilities, and students with Autism. The students in the sample have emotional disabilities as a primary disability with learning disabilities as a secondary disability. The study focused on students with emotional disabilities. These students were unsuccessful at public schools, and therefore placed at a nonpublic school.

An increase in instructional reading level to 3.2 grade level (as opposed to the 2.6 level of the non PBL student) and an overall grade equivalency of 4.2 (as opposed to 3.6) for these students can be attributed to Problem based learning. Students without Problem based learning in classroom showed below grade level scores continually as less than 4. This is consistent with the type of student currently enrolled at the school. The Problem based learning classroom also showed an increase in SS (+78) which indicates that student performance over time and across grade saw increases. Although the sample size is small there is a strong indicator that utilizing Problem-based learning has a positive effect on learning that can be measured by test scores. Scores universally went up across all of the measurable performance categories.

As indicated in the literature and prior studies Problem based learning is appropriate for students in primary and secondary education. It is also a useful pedagogical method for special needs students who are in reading classes. This type of active student centered active learning can be both meaningful (students gain lasting understanding) and measurable.

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# Entrepreneurial Orientation (EO) Dimensions, Resources And Small Firm Growth

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## ABSTRACT

*Entrepreneurial Orientation (EO) reflects the entrepreneurial strategic behavior displayed by firms, which contributes towards the success of firms. Though there is strong belief that EO results in superior firm performance though the empirical evidence supporting this notion is mixed. Most researches on EO believe that it is a uni-dimensional construct comprising three dimensions of innovativeness, pro-activeness and risk taking, which co-vary. This not only restricts the scope of firm level entrepreneurship but may also mask the influence of individual EO dimensions, which can better explain the inconsistent findings about its influence on firm performance. There is an alternative view that EO Construct is of multidimensional nature comprising five dimensions, which vary independently, though very few studies have examined this. In case of small firms with limited availability of resources knowing the dimensions of EO, which are valuable is an important issue. This research explores the relationship between individual EO dimensions and growth of small firms in emerging markets, which are resource constrained. It highlights the fact that the small firms should make judicious use of their limited resources by focusing on only those aspects of EO, which contribute to firm growth rather than the whole EO Construct.*

**Keywords:** Entrepreneurial Orientation, Dimensional Nature of EO, Co-Variance/Independence, Resources & Small Firm Growth.

# The Form Of Diagnostic Laboratories Impact On Marketing Practices

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## ABSTRACT

*The increased customer's awareness, customers self-testing, the technology advancement and also increase in the population are the prime factors which are responsible for the expansion of the in vitro diagnostic market. The complexity in the infections like infection of respiratory, hospital acquired infections, etc. is also increasing thus acting as one of the major drivers for expansion of In-vitro diagnostic industry. Similarly the rise in various chronic diseases are driving the overall In Vitro Diagnostic market. Unorganized local players so far had dominated India's diagnostic segment but there are no doubts that some organized players like Roche Diagnostics, Metropolis, SRL Ranbaxy etc. had also made their presence felt in this sector. The diagnostic sector growth is witnessed due to the few factors like advancement in the diagnostic procedures, faster turnaround time, over-the-counter (OTC) tests, etc. by which clients can perform in the comfort and convenience at their homes. The Indian pathology business is around 10,000 crore in that Organized sector business is around 1,000 crore only from the few top laboratories<sup>6, 11</sup>. The diagnostic industry is now price-driven, there are certain kickbacks and in the absence of a regulatory authority, demand of business referral payments had made this industry very much competitive in nature.*

**Keywords:** Marketing Practices, Strategy, Diagnostic, Owned, Chain, Hospital

## INTRODUCTION

Indian diagnostics players are too smartly putting their foot forward to meet the demand as around 70 percent<sup>8</sup> of treatment decisions are based on results from the laboratory. In different overseas territories they have expanded their presence. The spectrum of test menu is also expanded by the diagnostic industry had increased by expanding in the different areas like Oncology, Microbiology, Biochemistry and Molecular diagnostics. India's diagnostic segment maximum market share is captured by the unorganised local players but now it is competed by few organised players like Metropolis, Dr Lal's Pathology, Thyrocare, Roche Diagnostics, etc. The Indian diagnostics market is growing by about 20 percent<sup>5</sup> as per the industry experts. The organised segment had now explored the opportunities of expansion and capitalizing the market share by penetrating in the suburban and rural areas and also different ways can be opted as a route of expansion. They had come up with various business models to penetrate not only in suburban, but also in the town and remote areas. The growth in the diagnostic sector is witnessed due to the few factors like advancement in the diagnostic procedures, faster turnaround time, availability of over-the-counter (OTC) tests by which clients can perform in the comfort and convenience at their places. Recently the IVD market is shifting gradually towards automation of the laboratory instrument. The Indian pathology business is around 10,000 crore<sup>6</sup> in that Organized sector business is around 1,000 crore<sup>6</sup> only from the few top laboratories. The diagnostic industry is now price-driven, there are certain kickbacks and demand of business referral payments in the absence of a regulatory authority had made this sector very much competitive in nature.

## OBJECTIVES OF THE STUDY

- To find whether the form of organization (Chain, Owned, and Hospital) has significant impact on marketing practices in diagnostic laboratories.
- To study the marketing strategies impact on marketing practices in diagnostic laboratories.

## **LITERATURE REVIEW**

Kjellberg et al [2007] had defined market practice as “all activities that contribute to constitute markets” and practices which are interrelated create markets were identified that are normalizing, representational and exchange practices. They found health care market is based on mainly normalizing and exchange practices. Nariswari Angeline [2011] in there conceptual paper has focused on market practices as the unit of analysis by exploring the model.

The service dominant logic situates these market practices within the context of resource integration and value co-creation while practice based approach identified the key practices that constitute markets. The institutionalization of market practices, thereby setting up the rules for value co-creation amongst market actors is explained by institutional theory. Markets as such complex in form, can be broken down into different pieces that consist of a simple set of practices. The markets multiple levels and interactivity between them by using practices as the underlying unit of analysis by identifying key practices and translation as the link between practices one can study. Rizwan Raheem Ahmed et al [2014] studied that the effective communication mix development in marketing of health care sector is a complex task, which goes through target audience identification, objectives of communication, message design & its delivery, and feedback. The marketing professionals in health care sector are fast becoming aware of the latest development in the discipline of marketing, and thus started to adopt recent theories in the communications. Abdul Rahim et al [2015] through changes in marketing practices from traditional to entrepreneurial marketing practices had explored role of marketing practices in SMEs and evaluated the impact on SME performance. On old methods such as using print media and selling marketing in SMEs is centered. Izvercianu Monica et al [2015] analyzed the marketing practices embraced by small and medium scale enterprises (SME) managers to fulfill their organization objectives in terms of profit. The study was based on literature review, structured interviews and quantitative research; a sample consisting Maltese SMEs was used to acquire a broad image of the marketing practices used within SME type organizations.

## **RESEARCH METHODOLOGY**

- The research aims to study the marketing practices taken into account by Diagnostic Laboratories for their customers or increase in the market share. It was exploratory in nature because it measured the different marketing practices carried over by Diagnostic Laboratories for their customers or increase in the market share.
- For the study primary data was collected from sample of diagnostic laboratories.
- Secondary data was gathered mainly from research articles, books on marketing management, magazines, dissertations and other publications from conference proceedings.
- The formal instrument in form of questionnaire was developed to study the marketing practices of Diagnostic Laboratories and different problems associated with them.
- Researcher has used target population in form of owned, chain & hospital diagnostic laboratories.
- The sampling method adopted for the study was Purposive Non-Probability Sampling.
- The sample size is 177 consisting of Owned, Hospital and Chain Diagnostic Laboratories.
- Statistical tests used for hypothesis testing are ANOVA (Analysis of Variances) and Non Parametric - Kendall's W Test.

## **DISCUSSION OF RESULTS**

The following table No.1 shows a comparative picture of three types of organization (Owned, Hospital & Chain Diagnostic Laboratories) vis-a-vis, the seven P's and strategy score as compiled by the researcher.

**TABLE NO. 1**  
**Comparative Data of 7P's Verses Strategy**

Average Score	Owned	Hospital	Chain
Product	3.12	3.08	4.16
Price	3.15	3.03	3.59
Place	3.04	3.12	4.00
Promotion	3.11	3.09	3.91
People	3.09	3.22	4.43
Physical Evidence	3.15	3.08	4.29
Process	3.13	3.11	3.86
Positioning	3.07	3.15	4.17
Relationship Marketing	3.21	3.16	4.02
Strategy	3.01	3.05	3.99

Source: Field Survey, 2016

The mean is just above 3.00 (likert scale from 1 to 5) which shows that marketing practices are present for chain diagnostic laboratories, while for owned and hospital diagnostic laboratories they are hardly present for all P's of Marketing.

**HYPOTHESIS 1:** In diagnostic laboratories marketing strategies have no significant impact on marketing practices.

#### TESTING OF THE HYPOTHESIS

Using ANOVA and using strategy as a constant the F value of all the 7 P's (Product, Price, Place, Promotion, People, Process & Physical Evidence) is found insignificant hence hypothesis is proved.

**TABLE NO. 2**  
**Analysis of Variances (ANOVA) Test**

Measures of Association	R	R Squared	Eta	Eta Squared
Product * Strategy	.194	.038	.533	.284
Pricing * Strategy	.216	.047	.413	.170
Distribution * Strategy	.200	.040	.450	.202
Promotion * Strategy	.289	.083	.519	.270
People * Strategy	.251	.063	.456	.208
Physicalevi * Strategy	.184	.034	.429	.184
Process * Strategy	.193	.037	.448	.201
Position * Strategy	.232	.054	.467	.219
Relationship * Strategy	.183	.033	.451	.203

Source: Field Survey, 2016

<b>•ANOVA Table</b>							
	<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>		
Product * Strategy	Between Groups	(Combined)	17.056	26	.656	2.285	.001
		Linearity	2.255	1	2.255	7.856	.006
		Deviation from Linearity	14.801	25	.592	2.062	.004
	Within Groups		43.063	150	.287		
	Total		60.120	176			
Pricing * Strategy	Between Groups	(Combined)	5.999	26	.231	1.184	.261
		Linearity	1.641	1	1.641	8.419	.004
		Deviation from Linearity	4.358	25	.174	.894	.613
	Within Groups		29.237	150	.195		
	Total		35.237	176			
Distribution * Strategy	Between Groups	(Combined)	13.633	26	.524	1.461	.083
		Linearity	2.704	1	2.704	7.536	.007
		Deviation from Linearity	10.929	25	.437	1.218	.232
	Within Groups		53.830	150	.359		
	Total		67.463	176			
Promotion * Strategy	Between Groups	(Combined)	7.657	26	.295	2.132	.003
		Linearity	2.366	1	2.366	17.133	.000
		Deviation from Linearity	5.291	25	.212	1.532	.062
	Within Groups		20.717	150	.138		
	Total		28.374	176			
People * Strategy	Between Groups	(Combined)	14.950	26	.575	1.512	.066
		Linearity	4.524	1	4.524	11.897	.001
		Deviation from Linearity	10.426	25	.417	1.097	.353
	Within Groups		57.040	150	.380		
	Total		71.991	176			
Physical environment * Strategy	Between Groups	(Combined)	18.676	26	.718	1.301	.166
		Linearity	3.452	1	3.452	6.251	.013
		Deviation from Linearity	15.224	25	.609	1.103	.346
	Within		82.844	150	.552		

	Groups						
	Total	101.520	176				
Process * Strategy	Between Groups	(Combine d)	7.078	26	.272	1.451	.087
		Linearity	1.309	1	1.309	6.975	.009
		Deviation from Linearity	5.769	25	.231	1.230	.223
	Within Groups		28.150	150	.188		
	Total		35.228	176			
Position * Strategy	Between Groups	(Combine d)	10.931	26	.420	1.613	.040
		Linearity	2.697	1	2.697	10.348	.002
		Deviation from Linearity	8.234	25	.329	1.264	.196
	Within Groups		39.093	150	.261		
	Total		50.024	176			
Relationshi p * Strategy	Between Groups	(Combine d)	15.377	26	.591	1.471	.080
		Linearity	2.534	1	2.534	6.303	.013
		Deviation from Linearity	12.843	25	.514	1.278	.185
	Within Groups		60.310	150	.402		
	Total		75.688	176			

Source: Field Survey, 2016

As strategy is taken as an independent variable and compared with different P's of marketing, the F value suggest that there is a statistical difference between all P's and strategy.

However it is not significant difference in case of Pricing, Distribution (Place), People, Physical evidence, Process and Relationship. Thus out of different P's six P's show insignificant difference hence the hypothesis is proved.

**HYPOTHESIS 2:** In diagnostic laboratories the form of organization (Chain, Owned, and Hospital) has significant impact on marketing practices.

### TESTING OF THE HYPOTHESIS

As has been elaborated earlier the respondent's form of organization (Chain, Owned, and Hospital) has been compared by using non parametric Kendall's W test it is found that the marketing practices of chain diagnostic laboratories are significantly better than owned and hospital diagnostic laboratories.

Thus the form of organization has significant impact on marketing practices has been proved.

**TABLE NO. 3**  
**Non Parametric Tests - Kendall's W Test**

Ranks	
Type	Mean Rank
Owned	1.60
Hospital	1.40
Chain	3.00

Test Statistics	
N	10
Kendall's W <sup>a</sup>	.760
Chi-Square	15.200
Df	2
Asymp. Sig.	.001
a. Kendall's Coefficient of Concordance	

Source: Field Survey, 2016

### CONCLUSIONS

Except for chain diagnostic laboratories the respondent's appeared to be a little above neutral in case of all marketing practices. This suggests the apparent apathy of diagnostic laboratories towards marketing practices. The form of organization has significant impact on marketing practices of diagnostic laboratories

### IMPLICATIONS

The form of organization - and not the strategy of the organization - has significant impact on marketing practices resulting out of seven P's of marketing. The concept of marketing strategy appears to be less relevant than marketing principles and policies, especially in the context of healthcare sector.

### LIMITATIONS

The study may not be representing the entire country as diagnostic laboratories have been picked from Pune city. Still, the researcher is of the opinion that healthcare is the kind of industry wherein fundamentals are not changing with place. Since most of the studies pertaining to problem in hand have been carried out in foreign countries, literature reviewed has mentioned most of such studies. Such a literature automatically creeps in the work of the researcher also.

### FUTURE RESEARCH DIRECTIONS

The present research has made an endeavour to assess marketing practices of diagnostic laboratories of Pune City. Less constrained researchers may compare and contrast marketing practices of Indian Diagnostic Laboratories with those of such Diagnostic Laboratories situated across other countries. Obviously, this may help us in knowing where the Indian Diagnostic Laboratories stand in comparison to their global counterparts.

### AUTHOR BIOGRAPHY

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He also undertakes Industrial Consultancy & Research, training activities. He is a life member of professional bodies like I.S.T.E. He is a very popular teacher among the students and staff.

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# Perceptions Of Saudi Students In Experiential Learning At American Universities

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## ABSTRACT

*In a globalized and interconnected world, contemporary higher education institutions have assumed the responsibility for preparing students for rapid life changes. Experiential learning programs (ELPs) are one form of global learning that develops student global skills through practical experience in real world. This interpretive qualitative aims to explore the experiences of Saudi students who participate in ELPs at the U.S. universities. The study will add to the body of experiential learning research by uncovering many facts regarding Saudi students' participation. Social Exchange Theory will spotlight the meaning of Saudi students' satisfaction and overall impression when they complete the experience and final program reflection. The study's findings will provide an informative clarification for enhancing ELPs in US colleges and universities.*

**Keywords:** Saudi International Students, Experiential Learning Program, Social Exchange Theory

# Diversity In Local Governments For Implement Of Inclusive Education In Denmark

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Kanako Korenaga, Kochi University, Japan

## ABSTRACT

*In Denmark, there was a big municipality change for decentralization in 2007. It is called "Kommunalreformen" (reformation of municipalities). It means in the compulsory education system that each municipality can develop much more flexible education system than ever. It should be, however, inevitably restricted by their budget scale. Danish government complained of remarkably expensive cost to assign for pupils with special needs in compulsory ages after "Kommunalreformen". Then, the government has made a strong demand to decline the budgets for special needs education especially for outside of mainstream schools. Many municipalities should seek their own development of inclusive education with budget balance. It brings the progress of diversity in inclusive education system in Denmark. We have set to visit all municipalities for clarifying the feature what they were groping for a solution and developing a good inclusive education system. Some promotion of inclusive education in Danish municipalities will be discussed in our presentation.*

**Keywords:** Inclusive Education; Denmark Decentralization

# Volatility Transmission From Crude Oil To Agricultural Commodities

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## ABSTRACT

*Using unbiased AddRS volatility estimator, we examine the characteristics of volatility spillover from crude oil market to major agricultural commodities. We make use of the Heterogeneous Autoregressive Distributed Lag (HAR-DL) model, which include the volatility components at different investment horizon, to analyze the directional volatility spillover from crude oil to agricultural commodities. Our results highlight the structurally unstable behavior of volatility spillover from crude oil to the major agricultural commodity. After incorporating the conditional heteroscedasticity, we observe that no more structural breaks are observed in the volatility spillover from crude oil to agricultural commodities.*

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<sup>1</sup> This study contributes incrementally to the study “On Volatility Transmission from Crude Oil to Agricultural Commodities” published in Theoretical Economics Letters.

# The Strategic Approach To Extensive Reading In An EAP Program For Adult ESL Learners: A Case Study

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## ABSTRACT

*Reading is generally regarded as a purposeful, active, and strategic process where L2 readers engage in the text actively through the use of appropriate reading strategies and how to use them effectively and efficiently based on the purpose of reading. Reading, in that sense, is a dynamic interactive process that involves the reader, the text, and the interaction between the reader and the text (Eskey, 1988; Grabe, 2009; Grabe & Stoller, 2002; Koda, 2005; Nuttall, 1996; Rumelhart, 1977; Weir & Yan, 2000).*

*Recently there has been a great deal of interest in extensive reading (ER) related to reading areas. A large number of studies have emphasized that ER plays a significant role and should be integrated into the second language curriculum. (Day & Bamford, 1988; Renandya, 2007; Yu, 1993). In L1 and L2 settings, where the amount of reading can be more easily tracked, the amount of reading is strongly related to reading abilities (Anderson, Wilson & Fielding, 1988; Elley, 1991, 200, 2001). There is also good evidence that long-term ER leads to increased vocabulary growth, more confidence and motivation compared to traditional textbook oriented reading instruction. (Grabe, 2009). There are numerous reports of ER with learners learning English as a second language. In an ER approach, students read large quantities of books and other materials that are well within their linguistic competence. Students choose the books they are interested in and read at their own speed.*

*According to Hedge, ER is defined as: reading large quantities of material; reading consistently over time on a frequent and regular basis; reading for general meaning, primarily for pleasure, curiosity, or professional interest; reading longer texts during class time but also engaging in individual, independent reading at home, ideally of self-selected material (Hedge, 2000, p. 202). She also explained the benefits of ER as follows:*

*aLearners can build language competence, progress in reading ability, become more independent in their studies. acquire cultural knowledge, and develop confidence and motivation to carry on learning (Hedge, 2000, pp. 204-205).*

*ER can provide a learning environment within which learners have access to large quantities of written materials in the L2 for personal reading for pleasure. However, despite a lot of benefits of ER, there are not many studies carried out in an EFL context. Therefore, the purpose of this study is to investigate the role of extensive reading in foreign language learning classrooms.*

*This paper presents a strategic approach to ER for adult learners by helping them become more aware of several reading strategies and promote strategic reading behavior through ER in order to accomplish the ultimate goal of reading, which is helping them become strategic readers. Strategic reading, according to Grabe and Stoller (2002) involves: emphasizing strategic reading behavior, teacher modelling of strategic reading behaviors, reading strategies for dealing with densely written texts, and incorporating self-reflection, as a metacognitive strategy, into reading lesson (Grabe & Stoller, 2002, p. 205-222).*

*This experiment involving an extensive reading program was conducted over a six-month period with a group of learners of ESL learners in Korea. The program, using a variety of reading materials, was designed to foster ER for pleasure in addition to the regular academic English program for freshmen year students. Students are provided with lots of reading books or novels which are equipped in the department and are allowed to freely select the book they want to read. After they read, they are required to submit a book report with a short summary of the text.*

*This experiment was inspired by Krashen's Input Hypothesis (Krashen, 1982: 20-30) who proposed the importance of providing learners comprehensible input which is in most cases a little beyond the learner's current level. In his book, Krashen argues that ER will lead to language acquisition, provided that certain preconditions are met. These include adequate exposure to the language, provision of interesting material, and a relaxed learning environment (Bell, 1998)*

*Various data were collected in order to understand the role of ER in language learning in an EFL classroom contexts. Major instruments employed for this study were students reading comprehension tests(pre- and post-test), vocabulary knowledge test, writing report, and observation by the researcher.*

*The results showed an improvement in the performance of the reading skills and writing skills. The study has implications for language teaching on two levels. First, in theoretical perspectives, it supports Krashen's Input Hypothesis, indicating that extensive input can contribute to the enhancement of learners' language skills, especially in reading and writing skills. Secondly, in pedagogical perspectives, it provides strong support for the value of ER. On pedagogical grounds, ER studies can increase instructional quality by providing L2 teachers with a clearer understanding of the significance of ER, and thereby encouraging them to adapt their instruction to the diverse needs of readers. Thereupon, this study can be considered as an attempt to provide some insights into this ER research area.*

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# The Impact Of Environmental Policy On Stock Prices Of Taiwanese Solar Photovoltaic Firms

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## ABSTRACT

*Solar energy became the focus of the media for the past few years, and Climate Change is the main cause. The purpose of this study was to investigate the relation between International Environmental Policy (IEP) and performance of solar energy stocks. This work collects the total of 390 solar photovoltaic samples from December 2015 to January 2017, using the event study methodology to examine the impacts of a series good and bad IEP news on solar energy. Three environmental improvement related events chosen in our study are as follows. First, the leaders of China and U.S. telephoned each other and jointly supported the Paris Agreement. Second, Paris Agreement reached the threshold for ratification. Third, Paris Agreement enters into force. The major findings of this study are that the abnormal returns are significantly positive during the announcement period of the three environmental improvement related events. Particularly, the abnormal returns are the largest and most obvious for the first event, since the two strong economic countries, China and U.S., cooperate with environmental protections. Market investors expect that solar energy companies will receive many orders and increase their profits through the policies related to Paris agreement, so investors tend to purchase stocks of solar energy companies. Consequently, international environmental policy will increase stock prices of the Taiwanese solar energy companies substantially.*

**Keyword:** Event Study, Solar Photovoltaic Industry, Environmental Policy, Solar Energy

# Promoting A Changemaker Community In Teacher Education

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## **ABSTRACT**

*The rate and scale of change in the 21<sup>st</sup> Century has fostered the growth of a grassroots movement that seeks to empower individuals to create positive change and find solutions to societal problems-both local and global. Changemaking is a philosophy that has evolved to engage learners in making a difference in society by developing empathy, character and emotional intelligence. This paper will describe how one Southern California University's teacher education program infused changemaking into all aspects of the program. Specifically, models and methods drawn from project-based learning, problem-based learning, community engagement, and service-learning will be examined as a way to establish a supportive ecosystem for candidates to implement their changemaking skills.*

# Corporate Governance And Voluntary Disclosures In Annual Reports: A Post-IFRS Adoption Evidence From Ghana

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## ABSTRACT

*Purpose:* This paper examines how corporate governance attributes influence the extent of voluntary disclosures of non-financial firms listed on the Ghana Stock Exchange in a post-IFRS adoption era.

*Design/Methodology/Approach:* Data was collected from 22 non-financial firms listed on the Ghana Stock Exchange for the period, 2007 to 2011. Annual reports of each firm for this period was examined to determine the extent of voluntary disclosures made. Finally, a regression analysis was carried out to examine the effect of corporate governance practices on the extent of overall and specific types of voluntary disclosures of the firms.

*Findings:* The findings show that board size and board leadership structure positively influence the extent of voluntary disclosures of the selected firms. However, board composition and auditor type exhibit a positive significant effect on voluntary disclosure dimensions of financial data and forward-looking information.

*Research Implications:* For policy implications, the results suggest that reliance on sound corporate governance practices can help firms to improve upon their level of voluntary disclosures in their annual reports, which should inure to the benefit of the stakeholder community especially investors.

*Originality/Value:* This study is first of its kind to examine the relationship between some corporate governance practices and the extent of overall and specific types of voluntary disclosures of listed non-financial firms in the context of a developing country, Ghana, after the adoption of International Financial Reporting Standards.

**Keywords:** Voluntary Disclosure, Corporate Governance, IFRS, Ghana Stock Exchange, Ghana

# Impact Of Social Media On Communication And Collaboration Skills Of Undergraduate Students

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## ABSTRACT

*With social media becoming intertwined with everyday life, students are beginning to adapt their lifestyles and means communication solely to this modality. Throughout interviews and surveys regarding academic leader and business leaders' perceptions of 21<sup>st</sup> century skills, leaders perceived that social media had a negative impact on undergraduate students' communication and collaboration skills. Academic leaders stressed the importance of educating students on how to effectively use social media to enhance learning whereas business leaders perceived social media as a hindrance to a recent graduate's career. The purpose of this paper is to explore the results from the previous study of academic and business leaders' perceptions of 21<sup>st</sup> century skills by expanding upon the perceptions of the impact social media has on two most frequent skills discussed by both leader groups.*

# Reviewing Teaching Approaches For Programming Through Scratch In Compulsory Education

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## ABSTRACT

*As the popularity of “Computational Thinking” expands in the education realm, more and more studies have been conducted to investigate the effect of using visual programming languages, such as Scratch, to teach computational thinking. This paper provides an overview of the teaching strategies that were implemented in research studies that aimed at fostering computational thinking through Scratch in compulsory education. To do this, we examined 46 empirical studies. The analysis of these studies has led to the identification of two approaches in teaching programming through Scratch: student-centered and mixed-instruction teaching approaches. In the paper, we present different enactments of the two broad teaching strategies and discuss the implications of these.*

**Keywords:** Computational Thinking, Scratch, Programming, Teaching, Instruction Approach

## INTRODUCTION

It is widely acknowledged that computer programming needs to be introduced to young learners (Duncan et al., 2014; Williams et al., 2015) as a means to develop their computational thinking skills (Barr & Stephenson, 2011; Bocconi et al., 2016). Many countries have updated their K-12 curriculum to embrace programming. For example, Australian children are to learn about how to implement solutions to problems with programming (Falkner et al., 2014). England's new national curriculum of computing in 2014 requires students to have repeated practical experience of writing computer programs to solve problems (Department of Education, 2013). There are also numerous initiatives and frameworks in the U.S. such as Code.org and k12cs, to develop K-12 computing education. During this process, visual programming languages emerged as a popular choice for delivering computational thinking in compulsory education. As the programming languages evolving through time, more visual programming languages like LOGO are made available for young learners, for instance, Scratch, Blockly, AppInventor, etc. Especially, the design of Scratch, by MIT Media Lab, is intended for programmers younger than 16 and underpins Papert's constructivism (Taylor et al., 2010). The affordances of Scratch, "low floor, high ceilings and wide walls," makes it a popular programming environment for young learners (Portelance et al., 2016).

Due to these increased interest, more and more research is conducted investigating the effect of using Scratch to teach computational thinking in educational settings. These efforts are much needed as they can support teachers in schools. Teaching computational thinking to young students is a challenge faced by many education systems today. A large number of teachers are not equipped with adequate knowledge of computing or programming. A recent survey, conducted with 500 primary and secondary British teachers by YouGov and BJSS, reveals that 67% of teachers throughout Britain feel that they can't effectively teach coding to children aged between 8 and 15 as they don't have the right skills or tool (BJSS, 2017). A similar concern is expressed by the Swedish National Union of Teachers that 70% of Year 6-9 teachers do not have any education in programming (Skolvärlden, 2017). However, on the bright side, plentiful empirical research of programming education has been conducted in the school setting, which can help to mitigate the problem. This research can be used to highlight and support practices in schools. It is against such a background this paper reviews studies related to the teaching of programming and computational thinking in compulsory school with the aim to identify teaching/didactical strategies employed.

## **BACKGROUND**

A common vehicle for learning in school today is digitalization and technology (Hylén, 2013). Some countries have modernized their curriculum and teach programming in school from an early age. For example, in Australia young children are to learn about how to implement solutions to problems with programming (Falkner et al., 2014). In the U.K. national curriculum of computing from 2014 students are involved in writing computer programs to solve problems (Department for Education, 2013). Programming is stated explicitly in the curriculum for primary grades in Finland (Heintz et al., 2016). Estonia emphasizes on coding early in schools, to be able to face the country's lack of computer programmers (Perry, 2015). Computer programming in education is not new. Already in the 1960s, Perlis argued for "the need for college students of all disciplines to learn programming (Grover & Pea, 2013).

In Sweden for instance, programming knowledge was initially offered in vocational education in the 1960s and 1970s. At the beginning of the 1980s *Datakunskap* [computer science] was introduced in the *Gymnasium* [upper secondary school] (Rolandsson, 2011), and in 1983 an informatics curriculum was introduced, including system development, computing, and programming in civics and applied sciences. The experimental work was mainly done by mathematics teachers. At that time their competence didn't correspond to the demands (Rolandsson & Skogh, 2014). For example, Papert's (1980) instructional language, LOGO, which focused more on logical understanding than understanding the programming language itself, did never break through the whole way. With time the interest to introduce programming through languages such as LOGO decreased which has been explained by that 1) earlier languages such as LOGO was too difficult for younger students (complex syntax); 2) programming education and programming tasks were not aligned to students' interests and knowledge (abstract algorithms), and 3) programming was introduced in contexts where teachers did not have adequate expertise for guiding and inspiring. This despite that Papert argued for that programming languages should be easy to begin with and at the same time have a high ceiling with possibilities for increased complexity.

As the society has become more digitalized and as a consequence of the emergence of visual programming languages such as Scratch, that bridge the limitations of earlier programming languages, the interest of introducing programming in compulsory school has increased and been renewed (Sorva, 2012). Today teachers around the world explore, investigate and teach programming. Moreover, despite lack of knowledge in programming the teachers start projects and learn from their colleagues and students. For example, already in preschool children are introduced to programming by use of both analog and digital strategies (Chibas et al., 2018). Another study (Sjöberg et al., 2018), presented how two teachers systematically explored the use Scratch programming as a means to teach mathematics to 70 pupils in a primary school during two years. Soon, a wave of documents, teacher support courses, materials, educational offers by municipalities and national actors have been set in action. Programming is to be seen in a wider perspective, including creativity, control and regulation, simulation and democratic dimensions. This wider perspective of programming includes all aspects of digital skills.

## **METHODOLOGY**

### **Search Strategy**

This review followed Kitchenham and Charters' (2007) guideline for performing a systematic literature review. The search was executed in databases that are well-known and well established in the field of computing: ACM (Association for Computing Machinery), ERIC (Education Resources Information Center), IEEE (Institute of Electrical and Electronics Engineers), ScienceDirect, SpringerLink and Web of Science. The search terms were constructed by Boolean logic as follows: ((teach OR teaching OR learn OR learning OR education) AND (computational thinking)) AND (code OR coding OR program OR programming) AND (Scratch) AND (school OR K-9).

## Study Selection

The studies are screened according to the following inclusion criteria:

1. As the first version of Scratch was released in 2007, the search covered the period from 2007 to 2018.
2. Studies are written in English and with an abstract.
3. Only empirical studies that are peer-reviewed are eligible.
4. The experiments must have been conducted in preschool education and compulsory education (1<sup>st</sup> to 9<sup>th</sup> grade, alternatively, learners younger than 16 years-old)
5. The empirical evidence must contain assessments of CT skills that are developed through using Scratch (Scratch Jr.)
6. There must be empirical evidence on each developed CT skills separately.
7. The included studies must have demonstrated positive learning outcomes through using Scratch (Scratch Jr.).
8. The study needs to provide enough detailed information about invention regarding instruction approach, the focusing on "how was it taught/learned" rather than "what was taught/learned."

## Data Extraction and Analysis

The descriptions of teaching methods in each study were extracted into an Excel sheet. Two researchers collaborated closely for data extraction. Discussion was carried out until consensus was reached regarding teaching methods. The analysis is guided by Thomas' (2006) inductive coding process. The authors extracted the descriptions (raw data) in an excel sheet, then read the text closely to understand its content. Afterwards, the creation of categories took place. Two authors identified and defined categories together. Overlapping coding was documented and marked as one segment of text may be coded into more than one category. Then the authors continued to refine the categories by, for example, searching for subtopics, combining similar categories, separating contradictory points of view in one category, etc.

## RESULT

The search generated 2001 studies, and the review selected 46 articles upon the application of the inclusion criteria. Two main reasons that led to exclusion are non-empirical studies and study participants older than 16.

**Table 1.** Search results

Database	Search result
ACM	18
ERIC	3
IEEE	7
ScienceDirect	1
SpringerLink	13
Web of science	4
Total	46

The result found two major components in the interventions for teaching programming: teacher/student and learning material. Another actor in these experiments is researchers (research assistants). Sometimes, they acted as teaching agents. Table 2 lists the learning material (besides Scratch and digital hardware like computers, tablets, etc.) that are related to each instruction approach. The vessel and media include Code.org, Game Apps such as Flappy Bird, Equipment for unplugged programming, Internet such as Scratch online community, Quizzes, Reflective questions, Textbook, and Worksheets. The teaching approaches in the interventions are categorized as follows, 59% of them are student-centered, and 41% are mixed-instruction. This categorization draws indications on the degree of activity of students and their learning responsibility. The student-centered approach allows students to explore and self-manage their study. However, as teaching and learning are complex processes, when the student's role changes towards an active participant in learning, the teacher's role changes too. Then the responsibility shifts with a blurry boundary.

Hence, the mixed-instruction, implying that albeit students are the predominantly responsible for learning, teachers still have a somewhat “central” function.

**Table 2.** Category of instruction approach

Category of instruction approach (Amount of studies)	Teaching/learning material	Studies
Student-centered (27)	Equipment for unplugged activities, designed small tasks and exercises, game Apps for learning CT concepts, Internet such as Scratch online community or Code.org, worksheet	Athanasidou et al. (2016), Begosso&da Silva(2013), Baytak&Land(2012), Davis et al. (2013), Falloon (2016), Fatourou et al. (2017), Fields et al. (2015), Franklin et al. (2016), Funke&Geldreich(2016), Funke&Geldreich(2017), Giordano&Maiorana (2014), Grover et al. (2014), Grover et al. (2015), Hermans&Aivaloglou (2017), Jun et al. (2017), Kafai&Vasudevan(2015, Jun), Kafai&Vasudevan(2015, Nov), Lewis (2010), Moreno-León& Robles (2015), Moreno-León et al. (2015), Ruf (2014), Sáez-López et al. (2016), Tsukamoto et al. (2017), Vasudevan et al. (2015), Vaníček (2015), Wang et al. (2017), Webb&Rosson (2013),
Mixed-instruction (19)	Equipment for unplugged activities, example programs, Scratch online community, worksheet	Benton et al. (2017), Benton et al. (2018), Burke (2012), Burke&Kafai (2012), Calao et al. (2015), Flannery et al. (2013), Ke&Im (2014), Lee et al. (2017), Meerbaum-Salant et al. (2010), Mladenović et al. (2017), Papadakis et al. (2016), Peel et al. (2015), Plaza et al. (2017), Portelance et al. (2016), Sáez-López&Sevillano-García(2017), Segredoet al. (2016), Strahacker et al. (2017), von Wangenheim et al. (2017), Weng&Wong (2017), Wohl et al. (2015)

*Student-centered approach:* This way of instruction features students’ active engagement in autonomous and interactive learning. Teacher “retreated” to a facilitating role. Several studies (e.g. Athanasidou et al., 2016; Franklin et al., 2016; Giordano & Maiorana, 2014, Webb&Rosson, 2013) reported that teacher used scaffolding to assist students’ learning. “In the context of classroom interaction, the term scaffolding has been taken up to describe the temporary assistance that teachers provide for their students to assist them to complete a task or develop new understandings, so that they will later be able to complete similar tasks alone. (Hammond & Gibbons, 2005, p.9)” Some studies granted students high autonomy. It is believed that the major form of learning took place while they explored and constructed in Scratch by students themselves. For example, in Baytak & Land’s study (2011), the two teachers who were responsible for the classroom management had no knowledge in Scratch. Students were given resources, such as Internet, to learn about the subject and Scratch. They could explore Scratch freely and make personal choices about the artifacts. The teachers only guided the final presentation and discussion. The teachers imposed minimum inference, merely maintained classroom order. As students may have acquired different levels of programming skills with varied motivation, some mechanism of self-regulation was adopted to keep learners on track. Baytak & Land (ibid) asked students to keep a log of their planning and designs. There are also studies (e.g. Funke & Geldreich, 2016; Wang et al., 2017) that provided the learners with project requirements or assessment rubrics so that the learner could measure the progress and achievement on their own. Another characteristic of this approach is collaborative learning. 12 out of 24 studies divided students in to pairs or groups for project work. Peer feedback (e.g. Kafai & Vasudevan, 2015; Sáez-López et al., 2016) was commonly engaged in the studies as well. For instance, the students played each other’s game to give improvement suggestions. The peer teaching, communication and interaction influenced several aspects of their learning, such as their game designs (Baytak & Land, 2011) and block vocabulary (Webb & Rosson, 2013) and expressing (Jun et al., 2017). Furthermore, some teachers broke down the comprehensive problems into smaller tasks to guide students’ learning. Funke’s study (2017) provided a variety of short exercises in which different activities had to be transformed according to unambiguous instructions and the groups had to work together to solve a more complex task afterwards. Vaníček (2015) believed that a series of shorter tasks can boost intrinsic motivation to achieve the goal of creating some more extensive work. Another rationale, posited by Franklin et al. (2016, p.218), was that “it is not sufficient just to study whether students learned loops or any other single concept” but to activate students’ ability of appropriately combining these smaller ideas into a new context. And decomposed tasks could serve

that purpose. Regarding the teaching of the basic CT concepts, the review witnessed two different ways: plugged (with a computer) and unplugged (without a computer) teaching. In Jun's et al. (2017) experiment, children learned CT concepts from playing games on computer. Unplugged teaching, on the contrary, is to teach CT skills in the constructivist fashion, often using kinesthetics or activities without a computer (Bell, 2000). In Tsukamoto's et al. (2017) study, teachers taught sequences and loops with unplugged materials before game programming was introduced to the schoolchildren. Unplugged teaching is involved in mixed instruction as well. Some studies involved digital learning "Massive Open Online Course", MOOC (Grover 2014, 2015; Hermans & Aivaloglou, 2017). The teaching medium of MOOC in Grover's experiment (2014; 2015) is Khan Academy's style lectures, lasting 1 to 12 minutes typically. The students had to do one or two quizzes while watching the videos. This made sure that the learner understood the material and was engaged. An automated grading and feedback are given online afterwards. It is also linked to an online forum, a community that provides comments and answers. For programming courses, it lets users write code. The students in Hermans & Aivaloglou's study (2017) went through a course that was divided into several modules and there was an assessment by the end of the course. The MOOC platform possesses advantages of both student-centered and teacher-directed approaches. A physical teacher is replaced by digital platforms, it shifts the learning responsibility back to students. As they autonomously move onto a new module once they complete the previous one. The learning content and goal is clear and their understanding is timely examined. Generally speaking, the learning activity and process are orchestrated for the learners. Meanwhile, the new knowledge is not passively "served" to the users. It caters to individual learning needs and paces so that learners can take charge of their own learning. What's more, the online platform is of certain advantages as it is an application of mobile learning, for instance, the affordance of ubiquitous learning.

### **Mixed Instruction**

This style combines the traditional teacher-directed teaching and student-centered learning. It implies a spectrum of the extent of teachers' involvement, while the student-centered aspect is manifested through "learning by doing" in Scratch. It lays more weight on students' subject matter acquisition. Experiments, like Peel et al. (2015) and Plaza et al. (2017), assigned relatively more functions to teachers. They explained and modeled the content for students, which were transferred and applied by students later. The teacher taught programming with detailed illustrations and interpretation. The learning activities, interaction, exercise, etc. were orderly organized by teachers to facilitate students' understanding of the concepts in question. The teacher began with a review of the content taught in the previous lessons and then introduced new content. Students watched how the teachers programmed with the new concept step-by-step. An exercise session was dedicated to questions that corresponded to the new content where students could apply the new knowledge on their own. In the other cases with less degree of the directed instruction (e.g., Papadakis et al., 2016; Mladenović et al., 2017; Segredo et al., 2016), the teachers gave short and concise tutorials of specific concepts with simple guided activities before students took over the responsibility. The students stayed active as construction in Scratch was always one, if not the most, part of the learning regardless how teachers orchestrated the lesson. In general, compared to teachers in the student-centered category, the teachers of this instruction approach were relatively more visible in the learning process and displayed more Scratch proficiency as they programmed during teaching. It required preparation or exercise in Scratch programming beforehand.

## **DISCUSSION**

More and more countries are introducing programming in compulsory school, often without that teachers have the necessary training in teaching programming and against the background that we, in this stage of scientific development, know very little about the teaching and didactics of programming in compulsory school (Nouri et al., 2018). Therefore, in this paper, we set out to review the scientific literature that deals with programming in compulsory school looking at particularly the teaching methods employed in the reported studies. Our analysis resulted in a classification of teaching methods in two broad categories, namely student-centered approaches and mixed student-teacher-centered approaches.

Regarding the student-centered approach, we could conclude that the teachers' role in these were minimal, confined to starting lessons with general instructions and helping out, i.e., scaffolding, when asked for or evaluated as necessary by the teachers. Furthermore, a characteristic of the student-centered approaches was that students were given the task to explore the programming language/environment (Scratch) on their own, driven by their curiosity and interest and

many times by applying trial-and-error strategies. Starting out with pre-existing code that was remixed and modified by the students was also a common strategy as well as letting students collaborate in groups to code programs.

The other category of teaching methods employed was the mixed student-teacher centered approach. This approach can be characterized with a more structured organization of activities, a structure defined by the teachers, and by a more involved teacher that focuses on supporting students' concept development through explicit and structure instruction related to the concepts.

More than half of the papers reported on studies where the teacher employed a student-centered approach. While student-centered approaches certainly are used to some extent in various school subjects such as mathematics and natural science, it seemed to be more prominent and focused concerning programming education in compulsory school. Indeed, several reasons can exist for this, for instance, that such didactics might be appropriate considering the nature and characteristics of the subject itself. Another reason, however, which others also have pointed at (Nouri et al., 2018), might be related to the fact that many teachers lack didactical- and subject knowledge resulting in the didactical choice of letting the students explore the subject freely and collaboratively without a strong orchestration and teacher guidance. When employing this strategy, the teacher becomes an actor that take part in the collaborative learning together with the students resulting in that he/she learn the subject and the didactical challenges connected to it as well. Thus, such a strategy can result in changes and even complete shifts in teacher and student roles – i.e., students acting as teachers in the classroom and teachers as learners. Will there be implications of such changes and if so what? Are such changes positive, negative or both? What will happen when teachers develop their subject- and didactical knowledge with time? Will we see a stronger focus on teacher-led activities? From our perspective, these are important questions for future research.

### STUDY LIMITATION

Publication bias might pose a threat to the review's validity. Studies with positive results are more likely to be published than negative ones (Kitchenham, 2004). As this review only includes studies with positive learning outcomes, there is a risk that some of the teaching methods led to a false-positive result. Hence, the in-service teachers may not witness enhanced learning outcomes for adopting the method. Secondly, the categorization involves some grey area, especially, when one study does not provide a detailed description of the setting. Several cases were difficult to be classified, which may have affected the result.

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# Macgyver Meets Science Inquiry: Modeling Nutrient Pollution And Solution In The Classroom

Ken Newbury, Bowling Green State University, USA

## ABSTRACT

*Modeling a real-world problem in the classroom can provide opportunities for contextually rich, high interest science inquiry. However, barriers to classroom modeling, including difficulty developing accurate scale representation of a problem and the costs and time required for measurement and setup prevent wide-scale adoption in the science classroom. Using inexpensive and MacGyver-like strategies to model nutrient pollution as part of a Math Science Partnership grant awarded to Bowling Green State University, teachers and students demonstrated significant gains in content knowledge while engaging in model science-inquiry based labs ( $p < .01$ ). Evaluation of the project indicated a high level of student engagement and favorable teacher evaluation. The project and associated lab protocols offered opportunities for cross-cutting curricular study in multiple science content areas including ecosystems, watershed, botany, ground water, pollution, photosynthesis, mathematics and the nitrogen cycle and data analysis.*

*During presentation of this paper, participants will observe brief demonstrations of key lab activities and protocols while reviewing research findings related to an Ohio MSP professional development study. Lab protocols will be made available to all participants.*



Students from Bataan Intermediate School observe the results of their experiment to prevent nitrate runoff by planting buffer strips.  
(Picture reprinted with permission from The Sandusky Register.)

# The Experiences Of High School Students With Physical Disabilities In Art Classes At A Special School

Songyi Han, Incheon Eunkwang Special School, South Korea  
Misuk Lee, Kongju National University, South Korea

## ABSTRACT

*This study illustrated the meaning of participating in art classes for students with physical disabilities through the interviews with high school students with physical disabilities. For this research, 4 high school students with physical disabilities in special school were selected as participants. The subjects were derived from the process of interviewing them and categorizing data inductively by qualitative analysis. In the results, art classes were meaningful as the classes which were autonomous, self-directed, to encourage development, to realize the limits and overcome it, and to be made by both students and teachers. According to the results, it was suggested that the teaching strategies should be developed in various ways with reflecting the needs and interests of students with disabilities. And the necessities of art classes which are made by the students and teachers from applying referred teaching strategies to students were provided.*

# Dyslexia And English As A Foreign Language Learning: The Case For Digital Textbooks

Shizuka Itagaki, Kwansei Gakuin University, Japan

## ABSTRACT

*This case study examined the effects of the digital textbook called “Multimedia DAISY textbook” for a dyslexic student who is learning English as a foreign language in Japan. His test scores increased from 0 to 29 points as a result of studying English through the digital textbook for three months. Furthermore, he now loves to study English using the digital textbook instead of conventional paper textbooks. This case study found that learning through digital textbooks is helpful and effective for dyslexic students or those who have learning difficulties.*

*The subject of this study is a 7<sup>th</sup> grader attending a public junior high school in Japan. He has difficulties in learning, especially reading both Japanese and English. As previous studies have shown, reading English is harder than Japanese because the English orthography is known as “opaque”, characterized as having inconsistent print-to-sound conversion. On the other hand, Japanese language is “transparent”, in other words, print-to-sound conversion is congruent. For these reasons, English is even more difficult for this student to read. According to the student, he never likes to study English. Unfortunately, he didn’t get any scores on the mid-term test in October, 2017.*

*After the mid-term test, this student started to study English using “Multimedia DAISY textbook” at home for twenty minutes every other day. DAISY stands for “Digital Accessible Information System”. In Japan, DAISY textbooks have been available for dyslexic, visually impaired, and learning disabled students. While DAISY reads, the texts highlight at the same time. Not only the text and the audio are present but also the images or pictures can be displayed. These features make DAISY textbooks a multisensory material which is considered to be ideal to educate dyslexic students.*

*The subject student has got used to using DAISY textbook now, adjusting the reading speed, enlarging the texts, and repeating the sentence which he couldn’t understand or wants to listen again. He said, “It feels like I’m reading the English sentences on my own.” And “Unlike the paper textbooks, I can follow where the DAISY is reading because the texts are highlighting.”*

*Three months after he started to study English on DAISY textbook, he got 29 points on the test. Not only DAISY helped him increase his test scores, but also it enhanced his motivation to study English and self-esteem which is most important for dyslexic students. Nowadays, the number of students and schools that are adopting DAISY textbooks has been increasing. In 2017, more than 5520 students were using DAISY textbooks. However, this number is only 1% of all the dyslexic students in Japan. I hope that DAISY textbooks become more prevalent and familiar to learning disabled students, their parents and schools they attend. They will be helpful aids for those students especially when they learn English in and out of classroom.*

# The Power Of Flow: Harness Student Productivity, Creativity And Engagement

Michelle Derewonko, University of Alberta, Canada

## **ABSTRACT**

*Have you ever experienced being so grounded in your work that you completely forgot about the time? Where you felt a burst of creativity and productivity, all while feeling very satisfied with your work? Then you have likely experienced a state of flow. This presentation outlines the principles of flow and how they can be applied in an educational setting to increase student productivity, creativity, and engagement.*

# English Speaking Anxiety In South Korean Universities: Root Sources Of Apprehension And Practical Resolutions

Michael T. R. Madill, Hankuk University of Foreign Studies, South Korea

## ABSTRACT

*Developing English as a Foreign Language (EFL) speaking skills in South Korea presents several challenges and learners in this context regularly develop speaking anxiety due to a variety of factors. When they do not feel comfortable speaking the new language, they have difficulty improving, and do not have the necessary opportunities to practice what they are learning in the classroom. As an educator, it is essential to recognize the sources of English speaking anxiety and employ teaching methodologies that allow learners to feel more relaxed producing the new language. Therefore, the sources of speaking anxiety in this context will be explored and practical resolutions that reduce its impact will be presented. The participants were 82 learners studying at Hankuk University of Foreign Studies in Seoul, South Korea. The two measurement devices were a contextual survey and individual, open-ended interviews. The results showed that the three root sources of speaking anxiety were underlying social and cultural ideologies, inadequate preparation time, and a fear of making mistakes. With this information, educators can create comfortable classrooms where active participation is prevalent, in addition to, considerably reducing speaking anxiety among all language learners.*

# A Study Of Create The Corporate Culture In International Joint Venture

Wei Kakami, Chubu University, Japan

## ABSTRACT

*International joint ventures are formed for various purposes, one of them is technology transfer. So far, most of researches about international joint ventures deals with the transfer of production methods, and bringing productivity closer to the home country. There are very few studies dealing with the influence of organizational culture to technology transfer. But it doesn't mean that we don't have to give any priority on this matter. And this problem would be more complex on international joint ventures. One major factor affecting this problem is the culture. In case of the relationship between central office and subsidiary abroad, national cultures would be problematic. In case of international joint ventures, however, corporate cultures amplify the problem of culture and few researches have approached this topic.*

*Transfer of organizational culture is not as easy compared to production processes and techniques, because the culture takes more time to establish. Since TOYOTA's production method, technology, and institution have been used in NUMMI, and have been achieved a quite result. We can say it because the NUMMI's culture was born in the interlocking relationship between the organizational culture of TOYOTA and NUMMI' culture existed and supported the TOYOTA production system.*

*In this research, we retrospect the history of the past quarter century of NUMMI, a joint venture between Toyota and GM that are the top companies in the automobile industry in the world, and the analysis the formation of the organizational culture of NUMMI.*

# Development Of The Case-Based Reasoning Instructional Model Through Science Behavioral System

Hyounghum Kim, Chungbuk National University, South Korea

## ABSTRACT

*The objectives of this study are to develop a case-based reasoning instructional model focused on climate change for a high school Earth Science class in Korea and to study how students make sense of case-based reasoning approaches in regards to problem solving in earth science class in the point of view of science behavioural system. Therefore, a designing process of the instructional model was conducted according to the research's basic procedure as follows. First, an initial case-based reasoning instructional model was designed, based on theoretical considerations of case-based reasoning and research of science instructional models. Second, the validity of the designed model was determined by experts in science education and applied in a school setting through discussing the strengths and weaknesses of the model. The field application was conducted by 28 sophomores from one science track class in an academic high school. After the class ended, the participants were asked to answer a questionnaire about the lesson, and three days after the class, a semi structured one-to-one interview was conducted. Through the analyzed result about the interview contents, the first modified case-based reasoning instructional model was suggested. Third, the validation method of the contents about the first modified case-based reasoning instructional model was used by experts' review used in validation of a model or an investigating tool in general research. In the other words, the experts' review method suggested the model and assessed it by asking questions to the researcher using a simple checklist. The researchers who participated in the review were 5 experts who work in science education, 3 of whom were doctors and 2 of whom were in the middle of the doctor's course. This procedure enables experts to evaluate the accuracy of the research process and results because it gives an inter-rater reliability of the study. Based on the merits and demerits and improvement points of the instructional model determined through this validation process of the model, the second modified case-based reasoning instructional model was developed. Results suggest that students showed interest because it allowed them to find the solution to the problem and solve the problem for themselves by analogy from other cases such as crossword puzzles in an aspect of students' awareness of the designed model. This means students are motivated to study and the process of selecting and organizing educational content and teaching methods has to focus on students' active construction of knowledge. Therefore, the case-based reasoning instructional model can help researchers, teachers, and curriculum developers better understand students' process of learning and developing scientific knowledge about climate change.*

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# Influence Of Academic Resilience In Mathematics On Junior High School Students In Taiwan

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Ching-Yi Lee, Feng Chia University, Taiwan

## ABSTRACT

*Academic resilience in mathematics is defined as students' ability to successfully deal with academic setbacks and challenges that are typical of the ordinary mathematics course of school life (e.g., poor math grades, competing math deadlines, math exam pressure, difficult math schoolwork). This two-year-project study is aimed to explore the influencing factors of academic resilience in mathematics by the self-system model of motivational development (SSMMD) in the "context-self-action-result" process in Taiwan. The present study developed the construct of the contextual (parental involvement and teacher-student interaction) factors, self-system (math self-efficacy) factor, school engagement (academic engagement in mathematics) factors, and academic resilience in mathematics factors. The research implemented a 2-stage factor-analytic strategy and the sample was divided into two sub-samples. First, exploratory factor analysis and reliability analyses were conducted to examine the construct validity, and Cronbach's  $\alpha$  coefficient was calculated to test internal consistency by 285 randomly selected participants. Second, the remaining 304 participants were examined by means of confirmatory factor analysis to assess the discriminant validity of the sub-dimensions. Results indicated that there was a first-order two dimensions model of parental involvement, a first-order two dimensions model of teacher-student interaction, a first-order three dimensions model of math academic engagement based on the domains of cognition, affection and behavior, and a first-order three dimensions model of academic resilience in mathematics. After these constructs have been verified, the study continued to construct the SSMMD model with 1092 participants and the results indicated the reasonable fit of SSMMD model. The study will continue to examine the reciprocal relationship, the latent change model, and the latent growth mixture model in the second year.*

**Keywords:** Academic Resilience In Mathematics, Context-Self-Action-Result, SSMMD

# The Effect Of Foreign Investors On The Cost Of Equity Capital In Korea: Chaebols Vs. Non-Chaebols

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## ABSTRACT

*This study investigates the effect of foreign investors on the cost of equity capital, as well as how the association between foreign ownership and cost of equity capital changes under owner-managers exerting strong control power. Using 3,110 firm-year observations from 2002 to 2015, I find a significantly negative association between foreign ownership and cost of equity capital. This result implies that foreign investors have a positive influence on reductions in the cost of equity capital. However, this influence from foreign investors is more pronounced in non-chaebol firms. This unique finding implies that foreign investors do not effectively monitor firms that operate under strong control power of owner-managers.*

**Keywords:** Foreign investors, Foreign ownership, Chaebols, Cost of equity capital

# Managerial And Industrial Information Prognosis: From Business Decision Making To Asset Management

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Jiseon Shin, Sungkyunkwan University, South Korea

## ABSTRACT

*Failure of industrial systems and assets can result in safety and reliability concerns, which may lead to significant losses in firm revenues, market share, and brand reputation. PHM (Prognostics and Health Management) is an emerging discipline that enables diagnosis and prognosis of systems and assets, based on their health information from sensors, using physics-based or data-driven algorithms. Information prognosis, such as remaining life prediction and maintenance optimization, should prevent systems and assets from future failures, and can serve as a critical means for various business functions ranging from quality decision making to asset management. This paper provides business practitioners with implications for managerial and industrial applications of information prognosis based on its recent advances and relevant case studies, and discusses potential challenges in the state-of-the-art technology education.*

**Keywords:** Prognostics and Health Management, Business Decision Making, Managerial Applications, Reliability Engineering, Applied Statistics

# Determinants Of Generation Y's Beliefs On Face-To-Face Communication

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## ABSTRACT

*As more Generation Y cohort places less value on face-to-face communication, it however, still remains a preferred channel of choice in certain organisations. A number of researchers agree that there are many benefits to face-to-face communication ranging from the ability to handle ambiguous information; ability to facilitate rapid feedback and the ability to transmit non-verbal cues. However, these studies were not necessarily focusing on Generation Y's beliefs on face-to-face communication especially when used to market financial services. Therefore, the purpose of this paper is to propose and test a conceptual model of determinants of beliefs on face-face communication. The model will be tested and validated amongst a sample of 300 Generation Y students. The findings will be of great value not to financial advisors who need to make decisions about which channels to use to communicate to Generation Y, but also, will contribute to existing knowledge.*

**Keywords:** Face-To-Face Communication, Generation Y, Non-Verbal Cues, Equivocality, Feedback

# A Case Discussion Of The New Revenue Recognition Rules

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## ABSTRACT

*This case is based on actual events that occurred in a small manufacturing company. It was approaching year-end, and company needed to find a way to comply with the loan covenant restrictions imposed by the local bank. One possibility that occurred to the CFO was to go ahead and recognize revenue on orders that had already been completed but had not yet been delivered to customers. Doing so would, of course, improve both the company's current ratio and its debt ratio, both of which were not currently in compliance with those covenants.*

*The case analysis addresses issues that are useful starting-points for several different class discussions. First, there is simply the question of what the new revenue recognition rules require. To answer that question, students will need to research FASB ASC 606, Revenue from Contracts with Customers, understand what it says, and decide how to apply it to this particular set of facts.*

*This could also be a useful time to point out that both the IMA and the AICPA require that Accounting professionals remain current in field. Accounting standards change constantly, and answering this case provides a good example of what a professional must do to keep up-to-date.*

*Finally, the CFO's proposed strategy potentially raises ethical questions are worth exploring. This case provides a context within which to introduce the students to the idea that answers to accounting questions are not limited to just calculating dollar amounts. One useful starting-point for discussing the ethical issues would be an accepted set of professional standards like the IMA Statement of Ethical Professional Practice. Alternatively – depending on the focus of the course – this might also be a good time to introduce the Fraud Triangle and use it as a way of analyzing these events.*

*Overall, this case has the ability to support discussions of a number of relevant topics in various upper-level accounting classes, such as Intermediate Accounting, Fraud and Forensic Accounting, and Auditing.*

**Keywords:** Revenue Recognition, Ethics, Fraud, Case Analysis

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**Dr. Causseaux** is an Assistant Professor of Accounting at Siena College in Loudonville, NY. She teaches Financial Accounting, Managerial Accounting, Cost Accounting, and Fraud and Forensic Accounting. She is a member of the IMA, the AAA, and the ACFE. Prior to becoming a professor, Dr. Causseaux spent 14 years in manufacturing and commercial banking.

# Public Money For Private Interests: The Economic Implications Of Allocating Taxpayer Funds To Subsidize Professional Sports Stadiums

Brent C. Estes, Sam Houston State University, USA

Liette B. Ocker, Sam Houston State University, USA

## ABSTRACT

*The construction boom of professional sports stadiums in America is at an all-time high. Practical, multi-use facilities have been replaced with lavish single use stadiums with construction costs exceeding \$1 billion. Between 1990 and 2012, \$30.5 billion was spent on the construction of 94 major league sport stadiums in North America. Over half of the costs were subsidized by public tax dollars (Howard & Crompton, 2014). Over the last several decades, major league stadiums have been replaced at a rate of over 90% (Long, 2013). In some cases, new stadiums are being built to replace structures less than 25 years old. For example, in 1994, the City of Arlington Texas completed construction on a new stadium for the Texas Rangers Professional Baseball Organization at a cost of \$191 million. In 2016, the city voted to allocate \$500 million in taxpayer funds toward building a \$1.1 billion stadium for the Rangers. Proponents of using public money to subsidize new stadium construction costs point to the increased economic impact that new facilities bring to the host cities. Opponents, however, contend that the misappropriation of public funds is a way to simply fill the pockets of wealthy professional sport team owners and further burden financially strapped taxpayers and municipal/county budgets. The issue of misallocation of public financial resources can be summed up in the state of Ohio. The day before the Cleveland City Council approved \$241 million to be spent on a new football stadium for the beloved Browns, the Cleveland Municipal School District announced it would cut \$52 million over two years, resulting in 160 losing their jobs and the elimination of interscholastic athletics from a district that its own superintendent described as “in the worst financial shape of any school district in the country” (Cagan & DeMause, 1999, pg. 23). This research examines the economic implications of using public tax dollars to support professional sports stadium construction and the economic opportunity costs associated with subsidizing such facilities.*

# Social Presence In Online Classrooms - The Promises And Pitfalls Of Video Feedback

Cheri Ketchum, Ashford University, USA  
Chelsey Yates, Ashford University, USA

## ABSTRACT

*High quality feedback on student work is often viewed as the most important single influence on student achievement. This substantive feedback is linked to social presence, which is central to effective pedagogy in both face-to-face and online environments. However, social presence has traditionally been more difficult to achieve in online classes. Using videos might be a way to bridge this social gap and improve student engagement in online courses. Research has found that video-based feedback improves both students' and instructors' sense of being connected and improves motivation and this is crucial for learning. However, not all research has found that videos had such a significant impact and few have addressed workload issues. This project is designed to address some of the inconsistencies found in previous studies.*

*In this presentation, the pros and cons of using video feedback on student papers in an online course are explored in an environment where instructors are promised, and paid for, a 12-hour work week. The presentation will present current data that was collected from a small group of instructors to see what impact video-feedback has on instructor workload and instructor and student satisfaction. Instructors tracked their time leaving feedback in classes with and without the use of videos, students and instructors were surveyed about their feelings of being "connected" to the course and each other, and student evaluations of instructors were compared in video and non-video classes. Our early results have revealed that leaving video feedback takes more time, generates feelings of connectedness and results in better scores on student evaluations of instructors. While early evidence suggests there are reasons to require video-based feedback, several precautions are advised.*

# Creating Equal Access To Education For College-Bound Students With Learning Disabilities

Toby Tomlinson Baker, Pepperdine University, USA

## ABSTRACT

*There are significant factors which affect and limit college-bound students with learning disabilities. Students with learning disabilities may be diverted from academic tracks and geared toward community college settings or intentionally discouraged from applying to four-year programs. There are strategies for breaking down barriers between students with learning disabilities between their nondisabled peers, which this session addresses. High school services in the areas of academic preparation, self-advocacy, and social skills preparation such as interview skills may be in place, yet the specific outcomes of these programs have yet to be determined. This session examines the most notable research, using Grounded Theory Methodology, and explores the need to bring this issue to light.*

# Strengthening College Support Services To Improve Student Transitioning To Careers

William W. Arnold, Visiting Assistant Professor, Seaver College, Pepperdine University, California

## ABSTRACT

*The article reviews challenges facing colleges including the need for actions to address new circumstances of educating college students and preparing them for productive roles following graduation. These challenges are balanced by resources colleges are developing to facilitate college-to-career transitioning to first destinations following graduation. In a review of support services offered by colleges the article identifies innovative programs that show potential for improved career support for students. Sources, including surveys of students and employers, published writing by leaders in education, and reported data from colleges provide a present view of career support functions and suggest patterns of evolution. Colleges are strengthening their support to students department by department, but programs and activities across-departments need to be integrated to improve services for students. Leveraging synergies among campus support functions improves services to students. The use of student support case managers may eliminate the silos among college support functions. Designing programs around students and bridging gaps among support services can deliver more relevant and timely results. The article introduces the voices of students expressed in an upper division business course Management Theory and Practice. The actual words of students were acquired as byproducts of class assignments and course evaluations. Collecting these indirectly rather than as the focal point of student input lends a candid perspective. The comments interject both students' requests for assistance and their appreciation for the support they received.*

**Keywords:** College Career Services, Student Transitioning To Careers, College To Employment, College To Career Transitioning, Student Career Services, College Graduate First Destinations

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**William W. Arnold** is a Professor in the Business Division of Seaver College, Pepperdine University, Malibu, California where he teaches Management Theory and Practice, Current Issues in Management, Business Strategy, and Servant Leadership. Dr. Arnold held executive positions with several major health systems where he led revitalization and turnaround. A champion of authenticity in leadership, Dr. Arnold presented his experiences in *The Human Touch*. In engaging with students he illustrates business principles by drawing on examples from his career. Dr. Arnold holds Doctor's, Master's, and Bachelor's degrees, respectively, from Pepperdine University; University of California, Los Angeles; and the University of Washington.

# Preliminary Findings Of Interventions To Improve Mathematics Proficiency In STEM At An HBCU

Ira Walker, Hampton University, USA  
Arun , Hampton University, USA  
Susan McKelvey, SPM Evaluation, LLC, USA  
Spencer Baker, Stats to Go, USA  
Brandy Richeson, Hampton University, USA

## ABSTRACT

*A study was conducted at Hampton University to ascertain the effectiveness of a pedagogical intervention with the goal of increasing the mathematics proficiency of students majoring in science, technology, engineering and mathematics (STEM). This effort was funded through a grant awarded from the U.S. Department of Education for four years. The intervention consisted of utilizing the flipped classroom and project-based learning strategies. The participating students were freshmen STEM students majoring in biology, computer science, computer information systems, chemistry, engineering, marine and environmental science, mathematics and physics. The targeted mathematics course for this study was Pre-Calculus I. Students were randomly placed into either the intervention group or the business-as-usual control group. The latter group received instruction in the conventional manner characterized by the professor lecturing to the students. The flipped classroom in the intervention group featured a student-centered approach whereby the professor served in the role of being a facilitator instead of a lecturer/instructor. The students viewed on-line videos and performed group work in the classroom. The project-based learning strategy, also in the intervention group, required that the students work on computer-based projects which involved topics currently being covered in the class. The relative performance of both the intervention and the control groups was gauged by examining the final exam scores of the students at the end of the semester. The final exam was a common departmental assessment and was given at the same time. The design of experiment for this study was that of a randomized control trial (RCT) to ensure that there were no confounding covariates that could compromise the significance of the results. In this study the null hypothesis was that there would be no significant differences in the performance between the two groups as would be indicated by their final exam scores. Using the mean exam score of the control group as a baseline, the null hypotheses will be rejected if the p-value is less than the standard benchmark of .05. The presentation will highlight the goals and objectives of this study as well as its current state of progress. Frequency distributions will also be presented of the final exam scores from both groups for each semester that data had been collected. Additionally, quantitative statistical findings will be reported that preliminarily suggest that there was no significant difference in the mathematics proficiency between the two groups. Further evaluation of the data is ongoing to provide a more definitive conclusion as to the effectiveness of these two interventions.*

# Quality Management System Implementation In Large Building Construction Projects-Case Of Jordan

Ghaleb Y. Abbas, University of Jordan, Jordan  
Khaled J. Haddad, Arabtec Construction, UAE

## ABSTRACT

*Due to the large and rapid development of the Jordanian construction industry, Quality Management Systems (QMS's) have become a primary tool to assure construction projects completion according to specifications. This research investigated how the implementation of such QMS can affect large Jordanian building construction companies' performance in terms of project deadlines, budgets, and reputation. Also, find out which QMS's were used by these companies and the employee's motivation to develop such systems.*

*A questionnaire covering fifty one QMS variables was distributed to a twenty three first degree classified Jordanian building contractors and international companies out of eighty five registered in Jordan, the results were analysed using SPSS.*

*Analysis revealed that the implementation of a QMS enhanced client requirements, achieved customer satisfaction, increased company profitability and ensured project budgets were met. However, it didn't ensure that project deadlines were achieved. Also, the "Minimised poor quality of construction processes and products" was the leading motivation for employees to develop a QMS within a company, while "requirement by the Ministry of Public Works" was the lowest motivation. In summary eighty three percent of the surveyed companies used International Organisation for Standardization (ISO) as their QMS, about eight percent used Total Quality Management (TQM), while the remaining applied other tools. QMS implementation emphasised the increase in profit and reputation.*

**Keywords:** Quality Management System (QMS), ISO, Total Quality Management (TQM), building, construction, Jordan.

## INTRODUCTION

Over the past couple of decades, the topic of quality management has dominated the attention of those interested in management (Abdul-Aziz, 1994; Sillars and Kangari, 1997). The lack of QMS implementation resulted in contractors failing to get confirmation for the project from the client. Client satisfaction is an important goal for the contractor, and this satisfaction came from the implementation of project requirements according to specifications (Ofori et. al., 2002).

Furthermore, inefficient QMS implementation resulted in large losses in time and costs as scheduled deadlines and budgets were exceeded. Lack of QMS implementation meant that a construction team typically must rework the activity more than once, which caused difficulties in meeting the project deadline and budget. Also, imposed unrealistic deadline or budgets had a negative influence on quality (Crosbu 1997, Arditi and Gunaydin 1997).

QMS implementation should be the goal for construction companies and projects managers. The importance of quality in projects was and is of increasing importance. According to the PMBOK (2017), projects managers carry the primary responsibility to achieve the required quality, furthermore, construction companies who implemented QMS rigorously grew their business with time and improved their reputation (Willar and Coffey, 2016).

By implementing a QMS, projects can be completed within the specified budget and timeline. Furthermore, it has been shown that QMS implementation in projects enhanced competitiveness as well as image and achieved client and customer satisfaction. The success of any company passed from worked within the specified budget and deadline, and met the clients' specifications and requirements (Raymond and Bergeron 2008). Working within set budgets, deadlines and quality standards and satisfying clients was particularly difficult in the construction industry (Samiaah, Al-Tmeemy and Abdul-Rahman, 2011).

Lack of documentation and the complexity of using mathematical charts were major barriers to QMS implementation (Chen and Tang 1992). The key limitations of and barriers to QMS implementation in the Chilean construction projects were a lack of knowledge and experience. However, the relationship between owners and contractors was improved by the implementation of QMS (Serpell, 1999).

Managerial commitment to QMS implementation was very important. A statistical method was used to monitor QMS. The cost of quality should be considered as an investment not as an expense, which reflected the need for companies to maximise the organisation's competitiveness and business opportunities. The implementation of QMS in construction projects was reflected in customer satisfaction levels. The leadership and management commitment were crucial factors to the successful implementation of QMS in construction projects. Management support, cooperation between departments and understanding quality cost concepts were the major factors affecting QMS implementation.

This research yielded answers to how the implementation of a QMS can satisfy client's requirements and achieve customer satisfaction in Jordanian building construction companies, help projects meet deadline and budget, grow company sales and improve company's reputation. Furthermore, determine how long these companies have been implementing such systems, which QMS's were being used, and find out the employee's motivation to develop such systems.

## **METHODOLOGY**

The survey covered twenty three registered companies in Jordan out of eighty five Jordanian building construction companies classified as first degree and international building construction companies according too the Jordanian Construction Contractors Association (2015). To be included in this study, the companies must satisfy the following five conditions: minimum paid capital of must be USD 715,000 (JOD 500,000); minimum equipment value must be USD 350,000 (JOD 250,000); administration hierarchy must include a general manager, administration manager, financial manager and accountant; free technical hierarchy must include a technical manager, two engineers and a quantity surveyor; and finally the companies must have completed projects worth more than USD 28 million (JOD 20m).

The sample size of the study population was calculated according to Kish's (1995) equation;  $n' = (p*q)/V^2$ , where  $n'$  is the first estimate of the sample size,  $p$ : proportion of the characteristic being measured in the target population,  $q$ : complement of  $p$  or  $1-p$ ,  $V$ : maximum standard error allowed. With safety  $p$  and  $q$  0.5, and  $N$ : 85 construction companies,  $V$ : maximum standard error 10%, yielding a minimum required sample size of twenty companies.

A questionnaire was designed and distributed to the twenty three operational companies in Jordan to gather participants feedback based on their knowledge and experience regarding the level of QMS implementation in their companies. Questions regarding the examination of the QMS implementation were based on studies in the literature, which consisted of current problems within the quality system, the implementation of QMS-ISO 9001:2008 principles and elements, and the companies' business performance while implementing their QMS.

The questionnaire was designed into six sections; the first included questions about the respondent, company and project details; the second part included questions about the motivations to develop QMS; the third part included questions about ISO principles; the fourth part included questions about ISO elements; the fifth part included questions related to the problems of QMS implementation; and the sixth part included questions about companies performance. The items in the third and fourth parts employed a five-point scale ranging from one, "Yet to be implemented", to five "Fully implemented". The items in the fifth part used a five-point scale ranging from one, "Not experienced", to five,

“Always experienced”. The items in the sixth part also used a five-point scale ranging from one, “Very low performance”, to five “Very high performance”. Each questionnaire was delivered with a cover letter explaining the research purpose

### STATISTICAL ANALYSIS

The questionnaire included fifty one QMS variables; which consisted of eight QMS-ISO 9001:2008 principles, twenty QMS-ISO 9001:2008 elements, fourteen QMS barriers, and nine QMS key performance indicators. After the questionnaire was distributed, it was analyzed using SPSS.

Table (1) shows the positions that were obtained by the respondents. QA/QC managers were the most participating category in the questionnaire with a percentage of 30.5%, followed by QA/QC engineers with a percentage of 17.5%. The percentage of site engineers participated is 13%, project managers 8.7%, and the same for project engineers and electrical engineers. The percentage of construction managers is 4.3%, same as project directors and planning engineers.

**Table (1):** Positions of the Respondents

Position	No. of respondents	Percentage
QA/QC Engineer	4	17.5%
QA/QC Manager	7	30.5%
Construction Manager	1	4.3%
Project Manager	2	8.7%
Project Director	1	4.3%
Planning Engineer	1	4.3%
Site Engineer	3	13.0%
Project Engineer	2	8.7%
Electrical Engineer	2	8.7%
Total	23	100%

Several testing of hypothesis were conducted, next the most important six hypotheses are discussed.

#### **The first hypothesis examined the relation between Job position and QMS implementation and organization performance;**

**H<sub>01</sub>:** there are no differences in responses about ISO principles, ISO elements, difficulties in the process of attaining a QMS and organization performance among respondents holding different work positions (QA/QC Engineer, QA/QC Manager, Construction Manager, Project Manager, Project Director and others).

Table (2) results show that the P-value for ISO principles, ISO elements, difficulties in the process of attaining QMS and organization performance are (0.221), (0.051), (0.155) and (0.740) respectively. These values are larger than 0.05 significance level, the null hypothesis is accepted at  $P > 0.05$ . Hence, there is a statically insignificant difference in respondents' responses toward these variables regarding to different position.

Table (2): ANOVA for the First Hypothesis

		Sum of Squares	df	Mean Square	F	Sig.
ISO principles	Between Groups	3.423	8	0.428	1.565	0.221
	Within Groups	3.827	14	0.273		
	Total	7.250	22			
ISO elements	Between Groups	3.550	8	0.444	2.682	0.051
	Within Groups	2.316	14	0.165		
	Total	5.866	22			
Difficulties in the process of attaining QMS	Between Groups	7.786	8	0.973	1.825	0.155
	Within Groups	7.468	14	0.533		
	Total	15.254	22			
Organization performance	Between Groups	2.074	8	0.259	0.630	0.740
	Within Groups	5.760	14	0.411		
	Total	7.835	22			

The major customer sector was private sector with percentage of 82.6%, followed by international sector with percentage of 17.4%. No customers were from the governmental sector as shown in Table (3).

Table (3): Major Customer Sector

Major customer sector	Number of respondents	Percentage
Government	0	0%
Private	19	82.6%
International	4	17.4%
Total	23	100%

**The second hypothesis examined the relation between major customer sector and QMS implementation and organization performance;**

**H<sub>02</sub>:** there are no differences in responses regarding ISO principles, ISO elements, difficulties in the process of attaining a QMS and organization performance among respondents working in companies in different customer sectors (government, private and foreign). To test this hypothesis ANOVA analysis was conducted for the variables, as explained for the first hypothesis.

Results show that the P-value for ISO principles, ISO elements, difficulties in the process of attaining QMS and organization performance are (0.643), (0.060), (0.852) and (0.806) respectively. These values are larger than 0.05 (the level of significance), the null hypothesis is accepted at  $P > 0.05$ . Hence, there is a statically insignificant difference in respondents' responses toward these variables regarding to different customer sector.

**The third test of hypothesis examined the relation between Current QMS Used in the company and QMS implementation and organization performance;**

**H<sub>03</sub>:** there are no differences in response toward ISO principles, ISO elements, difficulties in the process of attaining a QMS and organization performance among respondents working in companies applying different QMS approaches (ISO, TQM and others). To test this hypothesis ANOVA analysis was conducted for the variables as explained earlier.

The results show that the P-value for ISO principles, ISO elements, Difficulties in the process of attaining QMS and Organization performance are (0.559), (0.353), (0.213) and (0.852) respectively. These values are larger than 0.05 (the level of significance), the null hypothesis is accepted at  $P > 0.05$ . Hence, there is a statically insignificant difference in respondents' responses toward these variables regarding to different QMS used in the company.

**The relation between ISO elements implementation and organization performance was tested using the following forth hypothesis:**

**H<sub>04</sub>:** ISO elements (at the level  $\alpha \leq 0.05$ ) have no significant impact on organization performance.

To test this hypothesis regression analysis was conducted. Results can be illustrated as follows;

ANOVA table shows that  $F = 7.705$  and  $p\text{-value} = 0.011$  less than 0.05 significance level. Hence, the null hypothesis is rejected. Thus, there is significant impact of ISO elements on organization performance.

- As reflected by the model summary Table, R value (0.518) is the correlation value of ISO elements on Organization performance. While adjusted  $R^2$  (0.234) of the explained variation in organization performance can be accounted for ISO elements.
- According to the coefficients table, the t values are significant at 0.05 levels for ISO elements. This emphasized that there is a significant effect of ISO elements on organization performance.
- Reflected to  $\beta$  value which gives an indication of how strongly a unit change in each independent variable affects the dependent variable. As shown one unit increase in ISO elements can significantly predict a (0.518) increase in organization performance.

**The fifth hypothesis examined the relation between ISO principles implementation and organization performance using the following test:**

**H<sub>05</sub>:** ISO principles (at the level  $\alpha \leq 0.05$ ) have a significant impact on organization performance.

Regression analysis was conducted; results are illustrated as follows;

- ANOVA table showed that  $F = 7.705$  and  $p\text{-value} = 0.011$ , less than 0.05 significance level. Hence, the null hypothesis is rejected. Thus, there is significant impact of ISO elements on Organization performance.
- As reflected by the model summary table, R value (0.518) is the correlation value of ISO elements on organization performance. While adjusted  $R^2$  (0.234) of the explained variation in organization performance can be accounted for ISO elements.
- According to the coefficients table, the t values are significant at 0.05 levels for ISO elements. This emphasize that there is a significant effect of ISO elements on organization performance.
- Reflected to  $\beta$  value which gives an indication of how strongly a unit change in each independent variable affects the dependent variable. As shown one unit increase in ISO elements can significantly predict a (0.518) increase in organization performance.

**The relation between Difficulties in the process of attaining a QMS and organization performance was tested using the following hypothesis:**

**H<sub>06</sub>:** Difficulties in the process of attaining a QMS (at the level  $\alpha \leq 0.05$ ) have no significant impact on organization performance.

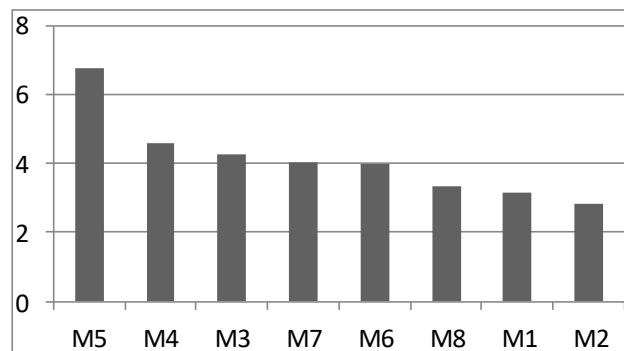
Regression analysis was conducted, results show that the ANOVA table showed that  $F = 0.405$  and  $p\text{-value} = 0.531$  (larger than 0.05 (the level of significance)). Hence, the null hypothesis is accepted. Thus, there is insignificant impact of difficulties in the process of attaining QMS on organization performance.

As for motives for developing QMS, the respondents were asked to rank eight motives they found important for the company to develop a QMS certified under ISO 9001 as explained in Table (4):

**Table (4): Motives for Developing QMSs**

Motive Number	Motive
M1	Betterment of the company's overall management system
M2	A requirement of the Ministry of Public Works
M3	Improve business performance
M4	Effectively and efficiently control project activities
M5	Minimize poor quality of construction processes and products
M6	Improve the companies' prestige (e.g. Image, reputation)
M7	Fulfill clients' requests as part of the bidding process
M8	Enter the international construction market

Figure (1) shows the results of the ranking. It is obvious from the figure that the lowest ranked motive was "as a requirement of the Ministry of Public Works and the highest ranked motive was "To minimize poor quality of construction processes and products".



**Figure (1): Motives for Developing QMS**

## CONCLUSIONS

Implementing a QMS enhanced the execution of client requirements and enabled customer satisfaction to be achieved. The implementation of QMS increased company profitability and enabled companies to meet project budgets. However, it did not improve companies' capacity to meet project deadlines.

Implementing QMS increased company profitability, grew sales and increased regional market share, improving the company reputation. In Jordan, 82.6% of construction companies use ISO as a QMS, 8.7% use TQM as their QMS and the remaining 8.7% applied another types. Implementing ISO principles and elements had a positive effect on company performance. However, difficulties in the process of attaining a QMS had no significant impact on organisation performance.

ISO certification was pursued by construction companies in Jordan to respectively: improve the quality of construction processes and products; effectively and efficiently control project activities; improve business performance; fulfilled clients' requests as part of the bidding process; improved the company's prestige (e.g. image, reputation); and enabled companies to enter the international construction market for the betterment of the company's overall management system and as a requirement of the Ministry of Public Works. Job position, major customer sector and current QMS type used had no effects on QMS implementation and organization performance.

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### AUTHOR BIOGRAPHIES

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**Khaled J. Haddad** holds a BSc in Civil Engineering from Jordan University of Science and Technology, Irbid, Jordan, in 2013. In 2017 he earned his MSc degree Engineering Project Management from The University of Jordan, Amman, Jordan. He joined El-Concorde Construction Company as QA/QC Engineer in 2013, and currently he is a Site Engineer with Arabtec Construction in Dubai, UAE.

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# Student Engagement In A Competency Based Education Program

Margaret Moodian, Brandman University, USA

## ABSTRACT

*Intended Audience: Writing Tutors, Writing Center Directors and Faculty Members*

*Proposal Topic: Student engagement is essential in competency-based education (CBE) programs. This presentation will discuss the many different ways we engage students the CBE program at Brandman University.*

*What is the significance of your topic?: The faculty members role is especially important in with CBE since we work one-on-one with the students. We play a significant role in helping move the students forward. Also, regular, substantive interaction is important in this type of program for accreditation purposes.*

*Why would this information be of interest/use to those that attend? CBE programs are becoming more prevalent in academia. The participants would be able to learn more about it, it's benefits and it may give them some ideas about how they can implement it at their schools.*

*What delivery methods/activities will you include to present your information and involve your audience? In my presentation, I intend to facilitate a dialogue not only about my best practices for helping students succeed with CBE, but also about what other schools are doing, offering a time to exchange ideas and connect with other educators concerned about how best to engage students.*

## PRESENTER BACKGROUND

At Brandman University, part of the Chapman University System, I am an assistant tutorial professor of humanities and social sciences. I am also a nonprofit board member and educator from Orange County, California, who serves on the boards of directors of the Blind Children's Learning Center, where I am vice chair, Tias Arms, a nonprofit that assists abandoned children affected by HIV/AIDS in South Africa, and Association of Colleges for Tutoring and Learning Assistance. I also serve as a Delta Gamma PRO, which means I speak to Delta Gammas and other members of the Greek community around the country about topics such as leadership and self-esteem.

I earned a doctorate degree in education and master's degree in psychology from Pepperdine University, and a bachelor's degree in fine arts from Chapman University. My dissertation focuses on the leadership traits of female Fortune 1000 board members. I live in south Orange County with my husband, Dr. Michael (Mike) Moodian (also a Pepperdine alum), son, rescue dog, and chinchilla.

# Proposed Philippine Model Of Collaboration For Children With Autism Given Interdisciplinary Experiences

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## ABSTRACT

*Given the research study on collaboration, Philippines as represented by a micro study of three major cities in the Province of Cavite showed low collaboration given low evidence of the indicators for collaborative elements in the existing practice of related services, low utilization on provision of related services given the stages of Individualized Educational Program (IEP) Planning, and low effectiveness in the indicators of attributes given the different collaborative models. The evidence of the indicators being practiced in terms of collaborative elements, utilization of related services provision integral in IEP stages, and visibility of attributes of different models of collaboration are moderately observed, implicating that the Philippines is just on its way to progress in terms of collaboration. Moreover, considering the recommendations by the members of the interdisciplinary team to strengthen the practice of collaboration, and all the factors for consideration to promote success and avoid failure in the practice, there is a need to propose a Philippine Model of Collaboration.*

*The model proposed is anchored on the study that covered three (3) major cities in the Philippines situated in the Province of Cavite described three topographical characteristic areas of highland, midland and lowland. Given such nature of the study, the model proposed evidently factored-in the comprehensive and rich experiences from various sectors in the context of collaboration making the study applicable to various situations of CWASD influenced by location, interaction and access to services given by interdisciplinary team members.*

**Keywords:** Model of Collaboration, Autism, Interdisciplinary Team, Related services, Educational services

## INTRODUCTION

Families who receive the diagnosis of Autism Spectrum Disorder (ASD) are faced with enormous challenges in caring for their children over a lifetime. Children with ASD (CWASD) have difficulties in adapting to the different domains of development because of their problematic presentations in social communication and repetitive patterns of behavior. Social communication poses a major problematic area of CWASD, understanding and confiding with social norms may be seen in extremes- the lack of eye contact, difficulties in expressing wants and needs or even disclosing information to strangers posing threat or possible exploitation (Siller, 2013; Spikins, 2013). Most children with ASD also present restricted interest (obsessions) and differences in perception from the norm, which several studies described as both talent and limitation (Kellman, 1998; Baron-Cohen et al., 1998; Williams & Costell 2000; Myers & Wheelright, 2004; Baron-Cohen 2006; Baron-Cohen, 2012 as cited in Spikins, 2013). Given the highlight of complexities in the different skill acquisition and domains of development, parents being the primary caregivers are expected to have knowledge on interventions, support professionals and special education (Organization for Autism Research, 2012) to ensure that problematic areas be addressed. It is common for families to seek and consult different professionals such as pediatricians and primary health care providers before receiving a conclusive diagnosis (Elder, 2013). Parents need to collaborate with different professionals to ensure quality outcomes of interdisciplinary services- *related and educational*.

Interdisciplinary services are offered with the intention to help students with disabilities develop unlearned skills or master developed skills that are at par with age. Related service providers are part of the Individualized Education Plan (IEP) team. They play a role in early screening as well as identification of students who are at risk for

developmental delays in the different domains of development- *cognitive/perceptual, speech, language and communication, psychosocial/behavioral/affective, sensory, psychomotor, physical, and self-help/adaptive domain*. The general goal for each related service provider is to help students participate in the general curriculum with peers, meet annual goals outlined in their IEP as well as take part in both academic and non-academic programs (Watson, 2015). Furthermore, they provide services designed to help children with special needs benefit from special education. Occupational therapists (OTs), Physical therapists (PTs), Speech and Language Pathologists (SLPs) together with audiologists, interpreting services, psychological services, recreation, including therapeutic recreation, social work services, and school nurse services are said to provide related services [Individuals with Disabilities Act (IDEA), 2004]. Their knowledge of the child's development is believed to offer substantive input for further progress of the child especially those with disabilities. In addition to consultations, therapists also provide teachers with supplies, equipment and resource information as to possible classroom intervention strategies (Reeder et al., 2011). As classrooms become more integrated with students with special needs, teachers must be more equipped with the knowledge as to how to attend to the needs of their students- this includes working with related services. Collaboration helps teachers gain a better understanding of the child's needs that aid in a more appropriate program accommodation or modification that fits the child (Blask, 2011). Kritikos & Bimaum, 2003 also discussed that collaborative teaming unites teachers and paraprofessionals giving them the opportunity to share skills, knowledge as well as method in facilitating learning.

Given the numerous services and intervention approaches a child with ASD can have to address the different problematic areas, the fact that is recognized across the board is that early intervention- by providing immediate treatment to symptoms is the best response for treating ASD (Dawson, 2008; Howlin et al., 2009; Reichow & Wolery, 2009 in Lyndon, 2013). Mundy et al., 2009 concluded that early intervention for initial problematic areas minimizes or even prevents prospective secondary problem behaviors which are often present with the condition. Furthermore, Dillenberger, 2011 mentioned that early behavior interventions produce substantial gains in cognitive, adaptive and social domains. In addition to this, Lyndon, 2013 enumerated several studies which reported positive outcomes on Early Intensive Behavioral Intervention (EIBI): (1) *increase in IQ* (Lovaas, 1987; Harris et al., 1991; Sheinkopf & Siegal, 1998); (2) *increase in standardized test scores* (Hoyson et al., 1984; Anderson et al., 1987; Birnbrauer & Leach, 1993; McEachin et al., 1993; and Strauss et al., 2012); (3) *positive outcomes in adaptive behavior* (Eldevik et al., 2012 and Straus et al., 2012); (4) *improved language scores* (Eldevik et al., 2012 and Straus et al., 2012); (5) *need for less support in school as compared to those who did not receive EIBI* (Fenske et al., 1987 and Lovaas, 1987); (6) *reduced presentation symptoms of autism* (Eikeseth et al., 2012); and (7) *decreased challenging behavior* (Fava et al., 2012).

The Philippines adapted the American influence on the practice and legislation of early intervention in the management of CWASD. Given the aforementioned roles of related services seen in the Individuals with Disabilities Improvement Act and No Child Left Behind Act even broadened the roles of OTs and PTs for therapist participation in early intervention (Reeder et al., 2011). There have been studies recognizing the importance of working with parents; however, some claims on parents' inadequate training, preparation and sometimes even the lack of support from the different services pose as barriers (Smets, 1982; Brand, 1996; Katz & Bauch, 1999 as cited in Kalyva, 2013). Despite the existing codes of ethics of the different professional bodies, which serve as protection against extreme cases of conflicts and exploitation, there are no existing guidelines delineating daily interactions between service providers and stakeholders (Strom-Gottfried, 1999 in Kalyva 2013). Even the code of ethics in special needs education does not sufficiently address the boundaries in relationships between professionals and parents of children with special needs which can hinder establishment of a good working relation to achieve desired outcomes (Kalyva, 2013). There is also a lack of statistical data as to the strengths of service collaboration for children with ASD versus those who do not receive collaboration between interdisciplinary services.

Given the importance of collaboration, this study will look into answering the question: Is the Philippines adapting a model of practice that suits the Filipino realities based on the experiences of managing CWASD in early childhood stage given interdisciplinary team approach? To propose a Philippine model of collaboration given the experiences of the interdisciplinary team in early childhood management of CWASD.

## POPULATION & SAMPLING

The study covered **Cavite** as the research locale. Given that Cavite represents itself with the unique features of having the highland, midland and lowland as a recognized province in the locally, it serves as a good research site to represent the Philippines demographically. Moreso, of the total number of cities and municipalities in Cavite, the top three (3) most populated localities emerged as **Bacoor, Imus and Dasmarinas**; hence, the study focused on these sites where the samples of the respondents were derived.

Provided that Autism is the case of focus in this study, in the Philippines, the Autism Society Philippines (ASP) estimated one million Filipinos to have Autism. Given this number, only five percent was formally diagnosed and two percent have access and are receiving interventions (Delfin, 2013). Interventions for CWASD dwell on the health, therapeutics and education. This makes medical **doctors, allied health professionals particularly physical therapist, occupational therapist and speech language pathologists, and teachers** crucial in the management of CWASD. All these professionals deliver services with the collaboration as a key factor towards successful outcomes. It is for this reason that this study included them as respondents together with **parents of CWASD** who are direct stakeholders to the health and educational services given the CWASD.

The **respondents** in this study were different members of the IEP team which are the parents, teachers (both regular and special education) from public and or private primary education schools, paraprofessionals or related services providers (PT, OT, SLP), and medical professional (referring physician and or clinical psychologist).

## RESULTS AND DISCUSSION

### Developmental Aspect of the Research Study

Given the experiences of the interdisciplinary team on collaboration, the factors contributing to its success or failure, the collaborative elements' evidence of existing practice of related services, the utilization status on provision of related services, and perceived effectiveness of collaborative models given attributes and top 5 prioritized ranking all gathered data, this section answers the objective as to the Philippine model of collaboration given interdisciplinary experiences that can be proposed. The model shall consider all the consolidated results particular to the measure of collaboration. To highlight, the model shall consider the **consolidated qualitative results** presented into five (5) major contexts. The contexts extracted from the narrative responses of the respondents that anchored on: a.) *professional recommendation*, b.) *availability and access to services*, c.) *knowledge, attitudes and scope of practice*, d.) *human and non-human resource allocation*, and e.) *negotiating and addressing conflicts*.

The model shall factor in each of the essentials of each qualitative theme crucial to collaboration promotion, particularly the: a.) *professional recommendation* – that which presented insights that the decisions as to the types of service and course of treatment may go with or go against the professional recommendation of service providers, b.) *availability and access to services* – that stakeholders go through all means necessary to obtain the services they believe to be beneficial for the child, c.) *knowledge, attitudes and scope of practice* – that having an open mind, understanding the frame and scope of practice of other members, and practicing different means of communication that would work among members is vital to having a good working relationship, d.) *human and non-human resource allocation*- that the effects of sufficient and/or inadequate use of resources, e.) *negotiating and addressing conflicts* – that the appreciation of members' role, identification and resolution of challenges.

Further, the model shall factor in the development the **consolidated quantitative results** which showed that a.) the most answered scale of measurement in the questionnaire by all respondents is **most of the time (Mo=3)** given the three (3) quantitative variables on collaboration namely: a.) *evidence of collaborative elements in the existing practice of related services*, b.) *utilization status on the provision of related services given the IEP stages*, and c.) *perceived effectiveness of the collaborative models given attribute/s and its top 5 rank* as perceived by the respondents. This most answered scale of measurement however is only represented by an overall **40.82% (Percentage Mean)** of the entire population of respondents (N=132) which presents as **low collaboration** considering the whole population of respondents.

Looking further at all the major quantitative variable indicators integral to collaboration as a whole, an overall

mean of **2.83** yielded as a result. This means that considering the responses of the entire population on indicators of collaboration per se, the Philippines is **on its way** towards progressing to excellence in collaboration but still has a lot of room for improvement so that it can do well with the practice of collaboration. This is about one (~1.17) scale towards progressing given the mean.

Considering all the attributes integral to all the major variables of *collaboration* the **top three (3) highest indicators** which are most observed by the entire population of respondents that shall be enriched in the proposed model are: a.) *Q6 – Value the importance of the roles of each member of the team (Mean=3.40)* followed by, b.) *Q57 – PARENTS ARE TREATED AS CO-THERAPISTS for the child through the help of the professionals (Mean=3.34)*, and c.) *Q12 - Understand the needs and insights of the child or family as stakeholders (Mean=3.33)* .

On the other hand, the **top three (3) lowest indicators** which are least observed in the study and will be subject to resolution towards best practice are: a.) *Q24 – Assessment and evaluation done by Assistive Technologist (Mean=1.07)* followed by, b.) *Q47 - The members of the team have LIMITED INTERACTION with each other (Mean=2.11)* and, c.) *Q65 -. Relationship of parents and professionals may become competitive if their interests, views, priorities and values are contradictory (Mean=2.15)*. The succeeding table presents the summary of overall findings on collaboration measured qualitatively and quantitatively in the study that shall be considered in the development of the *Proposed Philippine Model of Collaboration* as an output.

In consolidation of all findings gathered in the study, the following shall be integral to the proposed model that will be the bases for its validation:

The proposed model:

1. Ensures **professional recommendations** are successful by:
  - a) Taking into account that the recommendations of doctors and/or professionals are taken into account.
  - b) Promoting openness and understanding in the unique family situations of CWASD
  - c) Treating parents as valued stakeholders crucial to care and management of CWASD
2. Ensures **availability and access to services** of CWASD by:
  - a) Helping parents / caregivers to act as co-therapists of the CWASD
  - b) Helping parents manage problems commonly dealt with by Assistive Technologists not available in the country
3. Ensures **knowledge, attitudes and scope of practice** of the interdisciplinary team are understood by:
  - a) Promoting alignment of goals set within the parameters of the various disciplines involved with the CWASD towards successful outcomes and quality of life for the child.
  - b) Promoting openness and understanding of the scope of practice particular to the roles and responsibilities of each discipline and interdisciplinary team member involved in the care and management of the CWASD
4. Promotes **human and non-human resource allocation** for CWASD
5. Minimizes and if possible totally alleviates **conflicts** within and among members of the interdisciplinary team involved in the care and management of CWASD by:
  - a) Empowering parents to make sound decisions regarding the management of their child with ASD after a thorough understanding of the child's condition is explained and learned through education programs.
  - b) Minimizing conflicts within and among members of the interdisciplinary team on decisions made concerning the management and care for the CWASD through effective dynamics of communication and information dissemination.
  - c) Increasing the opportunities for interaction and collaboration among members of the interdisciplinary team in various stages of child management from assessment to program development, implementation and review.

**NATURE AND APPLICABILITY OF THE MODEL**

The model proposed is anchored on the study that covered three (3) major cities in the Philippines situated in the Province of Cavite described to have all three topographical characteristic areas of highland, midland and lowland. Integral to the study as well is the representation of parents of CWASD who are active in the Autism Society Philippines – a national organizational representation, teachers who are directly handling CWASD, and health professionals involved in the management of CWASD. Given such nature of the study, the model proposed evidently factored-in the comprehensive and rich experiences from various sectors in the context of collaboration making the study applicable to various situations of CWASD influenced by location as well as interaction and access to services given by interdisciplinary team members.

**OBJECTIVES OF THE MODEL**

The proposed model aims to:

1. Increase the evidence of the different collaborative elements particular to teamwork and service provisions for CWASD.
2. Increase the extent of collaboration integral to the different stages of IEP for CWASD.
3. Incorporate best attributes that can be found in the different models of collaboration towards a holistic practice of collaboration.
4. Incorporate invaluable recommendations from interdisciplinary members who are experienced in handling CWASD towards a holistic practice of collaboration.

Figure 10. Proposed Philippine Collaborative Model for CWASD given Interdisciplinary Experiences (Valenzuela, 2017)

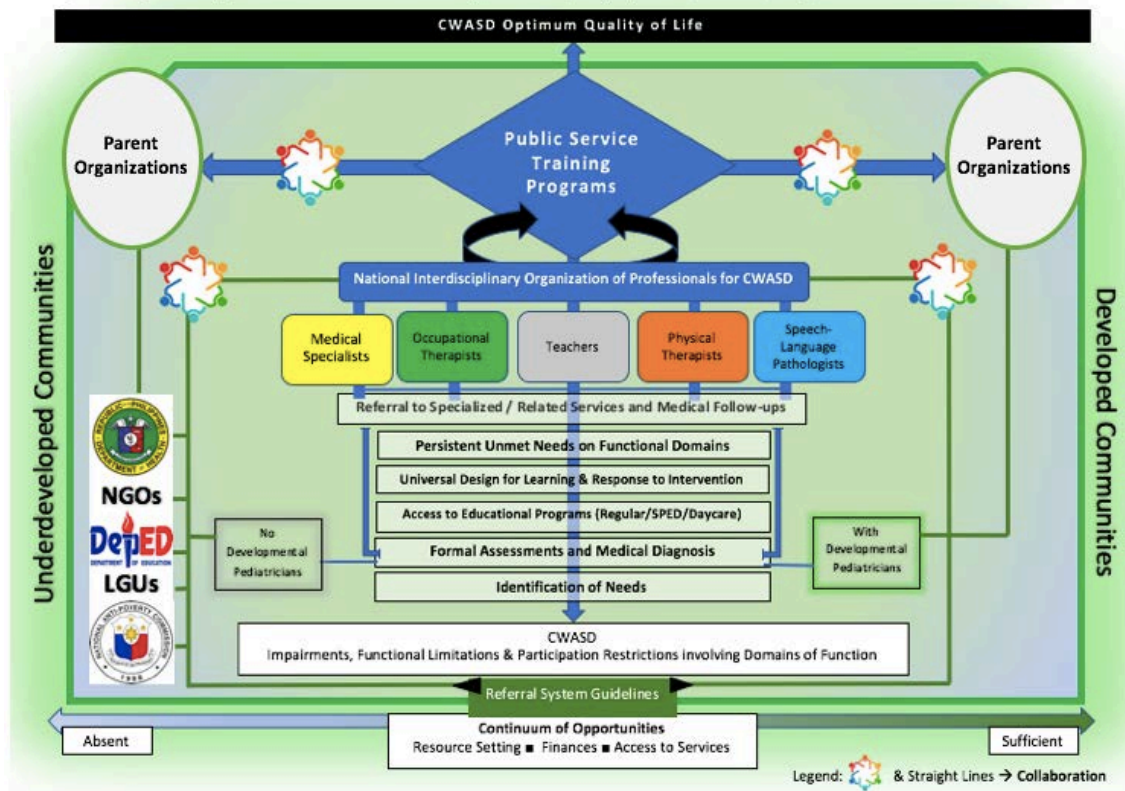


Figure 1. Proposed Philippine Model of Collaboration for CWASD given Interdisciplinary Experiences

The challenges faced by CWASD hinder them from achieving optimized quality of life. These challenges are in the form of impairments, functional limitations and activity restrictions which according to the World Health Organization need to be addressed through the help of the different people involved in the care and management of the child. It is best that parents or family members or caregivers of the CWASD who are direct stakeholders of the service delivery process be active in participation throughout the entire client management process which runs from assessment, evaluation, diagnosis, prognostication, planning for care, intervention delivery, to outcomes evaluation.

Active participation of the parent/family/caregiver stakeholders can be optimized through membership in a parent organization promoting the welfare of CWASD. In the Philippines, an active organization such as Autism Society Philippines (ASP) has established structuring itself in a nationwide scope in a manner in which their organization has reached its membership to the developed and even underdeveloped areas of the Philippine community.

The challenges of CWASD can emerge from different areas of their socio-cultural involvement with different sectors. Based on their needs, these can emerge as early as the stage of identification. The identification process of CWASD commences the quest for further measures so that their needs could be addressed. Identification process falls into the aspect of pre-referral whereby screening measures and child find activities set forth leading to the second stage that is referral. Referral demands formal assessments and medical diagnosis and in the Philippines, the role of Developmental Pediatricians is crucial to establish the primary direction the CWASD will take as far as detailed problem identification and intervention is concerned.

In the Philippines, there are less than 200 Developmental Pediatricians accounted for who are mostly affiliated in the National Capital Region. This divides the opportunities of the CWASD and their families towards equity in the access of their services since those who are in rural and underdeveloped areas may be missing out on the presence of a qualified diagnostician.

The limitation in accessing educational programs that is a right of every Filipino child is also affected by this since the practice of the educational system is to ensure that the child is given the special education program once a confirmation of the condition set by the diagnosis is established. The Philippine system of collaboration is dominantly embracing the medical model whereby the Doctors serve as key persons to set the tone and direction of the child's education, care and management given interdisciplinary set-up of services. CWASD students, on the other hand, who have already accessed school are further challenged given the extent and consistency of implementation of the supposed universal design for learning and response to intervention approaches that facilitates curricular adaptation in schools that benefit the CWASD especially in public schools in underdeveloped areas of the Philippine community which lack access to resources and teacher development training programs.

The persistent unmet needs of CWASD in the different domains of function especially those that involve communication, language and behavioral adaptation would warrant the need for further medical follow-ups and referral to specialized or related services given by specialists like occupational therapists, physical therapists and speech and language pathologists. These experts given various domains of function are not readily accessible especially in underdeveloped areas of the Philippine community. Just like the Developmental Pediatricians, majority of their services are concentrated on urban and developed areas of the community.

To address these concerns and challenges and achieve optimal outcomes for the quality of life of CWASD, the effectiveness in collaboration among all stakeholders is critical. To enrich the existing Philippine status of collaborative practices, the model proposes that the members of the interdisciplinary team organize themselves into a functional and structured organization where the roles, scope of practice and services of each discipline are clarified and the communication system is enhanced. Once established in a national setting, the continuum of opportunities can be directed towards sufficiency since the national organization can help balance and ensure

equity in the distribution of their services. They can also provide for ways by which an online system of direct linking and communication be established for the successful delivery of services for CWASD.

The same national interdisciplinary organization (NIO) can engage in service training programs that will empower all the members of the team especially the parent / family stakeholders in the care and management of CWASD. Training programs to educate and increase the knowledge of the ASD condition, delivery options for management (including modules for language and communication strategies in lieu of Assistive Technologists in the Philippines) and understanding of professional recommendations can be facilitated as well which lessens the conflict among stakeholders for CWASD.

Given the crucial role of the national interdisciplinary organization, its formal linkage to the parent organizations will be a significant leap in terms of bridging the gap in the services provision and accessibility. Other organizations, government and non-government structures like the Department of Health, Department of Education, local government units and private foundations, as well as the Philippine Anti-Poverty Commission that can be linked to NIO and parent organizations will all be a big help in providing for accessibility in finances, services and provision of appropriate resource settings for CWASD. The key is the direct link between communication and collaboration.

Lastly, all established organizations linked together through formal systems of affiliation can develop common referral system guidelines that will ensure clarity in roles, communication and linking of services that shall balance the continuum of opportunities for CWASD.

## CONCLUSION

To aid in the development of the proposed Philippine model of collaboration, the consolidated data of experiences of interdisciplinary team, factors contributing to success and failure of collaboration, frequency of practice of collaborative elements, utilization status provision of related services on IEP stages, perceived effectiveness of collaborative models given attributes and its top five (5) ranking were taken into account.

As to the overall findings of frequency of practice of collaborative elements, it was determined that related services are necessary for the student to benefit from the educational program. Educational goals of related services providers are part of the components if IEP and are embedded in the goals of special education teachers. Assessment and evaluation done by assistive technologist was presented to be least observed and assessment and evaluation done by medical doctor to be most observed. All other indicators as to the assessment and evaluation as well as development and implementation of members were contextualized to be *on our way* in the context of collaboration. The result of having the assessment and evaluation done by medical doctor is supported by Meleis (2016) that physician power is valued and dominant, thereby acknowledgement of medical science and interventions are given value. In the Philippine practice, practitioners following the medical model would still have doctor referrals as a prerequisite in the allocation of services.

As to the overall findings of utilization status provision of related services on IEP stages, all the sub-variable indicators under the *IEP stages* as a whole, an overall mean of **2.84** yielded as a result. This means that considering the responses of the entire population on the major variable per se, the Philippines is *on its way* towards progressing to excellence in collaboration.

As to the overall findings of perceived effectiveness of collaborative models given attributes and its top five (5) ranking, all the sub-variable indicators integral as *attribute/s of the collaborative models* as a whole, an overall mean of **2.77** yielded as a result. This means that considering the responses of the entire population on the major variable per se, the Philippines is *on its way* towards progressing to excellence in collaboration. Results of the study showed that most number of respondents chose indicator item number fifty-five (**Q55**) '*PATIENT/CLIENT/STUDENT-CENTERED CARE is the focus and the professionals from different disciplines strongly work together for this ultimate goal*'. In the questionnaire as the **top one (1) priority** indicator for collaboration given a **Mode score of 46** out of 132 total respondents, followed by three (3) items which were ranked as second priority with Mode score of 17. The second

ranked priority were indicator item numbers Q51- “There is ENHANCED COORDINATION and COOPERATIVE ENGAGEMENT among members of the team”, Q54- “Professionals from different disciplines have detailed KNOWLEDGE of the other professions and WORK TOGETHER TO BUILD ONE SOLID TEAM” and Q55- “PATIENT/CLIENT/STUDENT-CENTERED CARE is the focus and the professionals from different disciplines strongly work together for this ultimate goal”. Since indicator item Q55 was already ranked as top 1 priority and Q51 was also ranked by the respondents as rank 4 with higher Mode value of 25 respondents, **priority rank number 2** was declared as item number **Q54** “Professionals from different disciplines have detailed KNOWLEDGE of the other professions and WORK TOGETHER TO BUILD ONE SOLID TEAM” (Mo=17). **Third in rank** as priority attribute was item number **Q56**- “Professionals play key role in addressing the problematic areas of development and focus on COMMUNICATION WITH THE FAMILY in achieving set outcomes.” (Mo=16), **fourth rank** with **Q51**- “There is ENHANCED COORDINATION and COOPERATIVE ENGAGEMENT among members of the team” (Mo=25) and **fifth in rank** is **Q58**-” Professionals TRANSFER SKILLS NEEDED FOR THE FAMILY to ensure follow through at home is established.” (Mo=23).

Given the research study on collaboration, the Philippines as represented by a micro study of three major cities in the Province of Cavite showed *low collaboration* given *low evidence* of the indicators for *collaborative elements in the existing practice of related services, low utilization on the provision of related services given the stages of Individualized Educational Program Planning, and low effectiveness in the indicators of the attributes given the different collaborative models*. The evidence of the indicators being practiced in terms of the collaborative elements, utilization of the related services provision integral in IEP stages, and visibility of the attributes of the different models of collaboration *are moderately observed* thereby implicating that the Philippines is *just on its way to progress in terms of collaboration*. Moreover, in consideration of the recommendations given by the members of the interdisciplinary team to strengthen the practice of collaboration, and all the factors for consideration to promote success and avoid failure in the practice, there is a need to propose a Philippine Model of Collaboration.

The model proposed is anchored on the study that covered three (3) major cities in the Philippines situated in the Province of Cavite described to have all three topographical characteristic areas of highland, midland and lowland. Integral to the study as well is the representation of parents of CWASD who are active in the Autism Society Philippines – a national organizational representation, teachers who are directly handling CWASD, and health professionals involved in the management of CWASD. Given such nature of the study, the model proposed evidently factored-in the comprehensive and rich experiences from various sectors in the context of collaboration making the study applicable to various situations of CWASD influenced by location as well as interaction and access to services given by interdisciplinary team members.

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# Keynote: Enhancing The Learning Environment Of Students And Faculty By Embracing A Theoretical Framework Of Caring

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## ABSTRACT

*In nursing, health sciences and all academic disciplines, revisiting our “roots” is an essential journey for our own professional growth. What was the basis for you to enter the field of education? For many, it was the opportunity to reach out and care for others and foster students’ development and learning. The foundation of this journey is caring.*

*Embracing a theoretical framework grounded in caring science may enhance learning and satisfaction within the academic community for both faculty and students (Boykin & Schoenhofer, 2001; Groenwald, 2018). Caring for self, colleagues and students is an expected practice of nursing education. Promoting caring for self and others may be viewed as a means to foster engagement, social presence, and a vibrant teaching and learning community.*

*Caring is the framework through which nurses implement the art and science of professional practice. If caring is a framework for practice, a significant challenge is conveying the passion of caring in the realm of the physical and virtual world of teaching and learning. The element of caring as fostering human freedom embodies the essential essence of academic freedom. “Authentic human caring is not subservience, not subordination, not subject to control but a way of living that fosters human freedom in all relationships.” (Roach, 2002, p. 7).*

*Caring for self, colleagues and students is vital for growth and development as it can transform the workplace culture (Groenwald, 2018). Embracing a culture of care is a way to get back to one’s roots and become grounded in the aspects of life that are vital for humanity. During our academic career, we give of ourselves, our time, our talents and our lives. Those in education have been given the incredible opportunity of being instrumental in the development and establishment of collaborative learning communities. Boyer (1995) suggests six essential qualities for any learning community to exist: (1) purpose, (2) communication, (3) discipline, (4) justice, (5) caring and (6) celebration. In accordance with this premise, before a student can openly grow and mature, the essential qualities of a learning community must be developed and embraced.*

# Securing Confidence With Data Escrow

Donna M. Schaeffer, Marymount University, USA  
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## ABSTRACT

*In the past several years, the general public has had concerns about hacking and identity theft. Headlines in news media include computer system breaches at popular and respected companies like Target and universities like The University of California at Berkeley.*

*This paper explores options available for providing the general public with the benefits of the information age while mitigating against the security risks. We begin with a discussion of it is reasonable for the general public to expect organizations engaged primarily in commerce to provide for their cybersecurity. We then look at how electronic transactions are currently secured. We conclude with a consideration of the “protocols” or “institutions” that might provide for security for consumers.*

**Keywords:** Cybersecurity, e-commerce, data

## INTRODUCTION

The terms “digital world” and “the information age” mean many different things to people, but the promise the terms hold is generally an improvement over current conditions. The shortcomings, e.g., identity theft, that many people experience from participating in the digital world or information age, can in no way be viewed as improvement. In this section, we define important concepts, provide examples of the impact on people and the public when shortcomings are manifested, discuss reasonable cultural expectations about security, look at how we currently develop e-commerce systems, and provide an alternative approach.

It is useful to reflect on the four terms that comprise the title of this work: securing, confidence, data and escrow. Securing means to protect against threats or to make safe. The general public wants their electronic transactions and records to be secure.

Confidence means the feeling or belief that one can rely on someone, or something or a firm trust. The general public will not use digital systems that they do not trust.

Data is distinct information that is formatted in a certain way. The general public has to have confidence that data in electronic records is secure.

Escrow is a bond, deed, or other document kept in the custody of a third party, taking effect only when a specified condition has been fulfilled. This concept becomes important because there are some transactions where none of the entities party to the transaction “own” the data. Yet that data is needed for the transaction to occur, and a third party aids the transaction.

The scope of allowing the general public to feel secure about digital transactions continues to grow. While once limited to the physical act of giving a credit card to a point of sale terminal in brick and mortar businesses, our digital transactions now take place in new ways and in industries that we may not have had transactions with in the past. Some examples include:

- Gaming: 11,266 log-in credentials were stolen from Microsoft Xbox users (Ellison, 2015).
- Dentistry: 151,626 patient records were stolen from the Advantage Dental group (Pamplin Media Group, 2015).

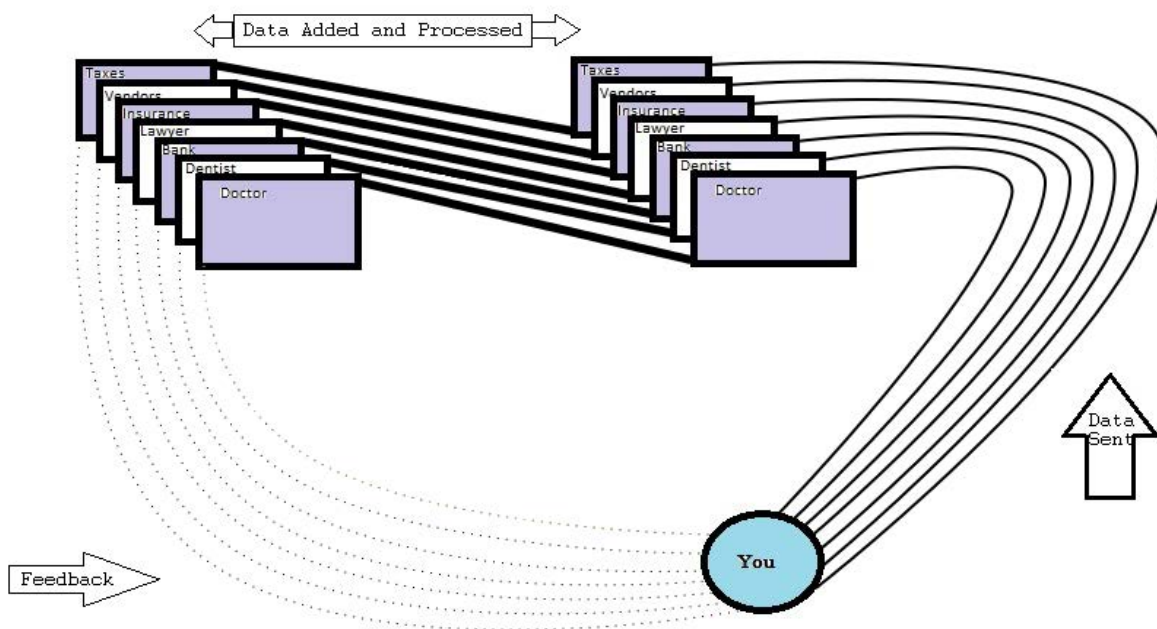
- Food service: an undisclosed number of debit/credit card information stolen from point of sale terminals at Bistro Burger (Greenburg, 2015).

Computer security breaches are so prevalent that the Privacy Rights Clearinghouse maintains a website dedicated to tracking breaches which are happening in almost every industry at what appears to be an increasing pace.

There is a great social need for secure transactions, and the general public has reasonable expectations that such transactions will be secure. This expectation may not be reasonable due to the scope of digital commerce. For example, by 2018 the web will account for 11% of retail sales. This is approximately \$414 billion dollars (Forrester Research, 2014). Consumers between the ages of 25 and 33, i.e. Generation Y, spend more online than any other age group, with an average of \$563 per individual in the first three months of 2014 (Forrester Research, 2014). Additionally, Generation X consumers, those between 34 and 47 years old, spent an average of \$535 each online during the first three months of 2014 (Forrester Research, 2014). Ultimately, 69% of U.S. adults regularly buy online and purchase about 16% of their products online (Forrester Research, 2014).

Individuals engage in many different transactions in any given day. Any commercial transaction, for example buying a drink, involves at least a business process transaction at the point of sale. If the transaction involves a debit or credit card, there will be additional processes. The systems that manage each of these processes have been analyzed and built from a process-centric point of view. Even though transactions are a movement of data, the digital systems are almost always process oriented rather than data-oriented and are generally built from a client-server model. Figure 1 provides an abstract model of this type of system.

**Figure 1. Process-oriented System**



Failing to use a data-oriented approach may be one source of security problems. The figure shows that data is collected, moved, and processed to provide a service or good to "you", or the general public. Members of the general public will suffer if the data is mishandled, but likely have little or no access to the data.

The process-oriented model may inevitably lead to system security problems. Systems designed from this viewpoint are built to perform for the organization's interests, which may not be the same as the interests of the consumers they serve. As observed in Figure 1, "you", which represents the client or customer is outside the system boundary. Thus,

even though all of these systems exist (at least in some sense) to support the “you” in the diagram, the “you” is not part of the system.

Thus, the “you” in the diagram is on their own. There is information about “you” everywhere, yet “you” have little or no control over that information, and may not be able to compel the appropriate use and support of that information. In fact, “you” have no way to insure that the information is even used properly for the immediate transaction, nor that it is being managed and stored for “your” best interests.

### **A SOLUTION: DATA ESCROW**

An architecturally simple solution to this issue exists. The means of making sure all parties “get their due” from a transaction has been handled for many years in the financial industry by using escrow accounts. An escrow account is a contractual codification of what each party is entitled to and a specific description how the transaction works with a third party (in the financial industry the third party is a bank), acting as the independent entity that proctors the transaction. Most people who have purchased a house have experienced escrow. For example, a down payment may be held in escrow until a loan is secured. An escrow account may also be used to accumulate money for property taxes or homeowners’ insurance as the buyer makes their monthly mortgage payments so annual transactions occur seamlessly.

For computer systems, the concept of escrow has been applied over several decades. As early as 1985, a law journal article discussed source code escrow (Pappous, 1985). Source code was placed in escrow to give the customer a safeguard against the various problems that the vendor might encounter as a company. In effect, if the vendor company were to go out of business, the customer was to get a copy of the source code

Frankel and Young (1995) provide an interesting examination of the use of standards and hardware to provide escrows. The Escrow Encryption Standard (ESS) is implemented in hardware as a “Clipper” chip. The United States government funded research and development, with the goal making communications more secure. A number of important questions related to the strength of the algorithm, management of keys, and even use of specific data fields raise concerns about this approach and the conclusion is that the system was too complicated. Additionally, for the Clipper Chip to be successful, a trusted “organization” was necessary and this never evolved.

Computing technology can improve the escrow process, but it is not without difficulties. For example, what happens if one of the parties to the escrow agreement loses their key? In a physical system, the loss of a key can be addressed in a variety of ways. Denning (1996) studied 29 key escrow systems or approaches. Only five seem to have no data recovery approach. It seems that the issue of losing a key can be resolved.

The pervasiveness of digital systems brings important security concerns. For example, the exponential growth in data mining yields important privacy considerations and digital payment systems are intended to be a major paradigm shift for privacy throughout the world (Jarecki, Patrick, & Shmatikov, 2003). The proposed solution is to move the responsibility for the key from the analysts to the “data generator” (also known as the user or the you in Figure 2). This user “pre-negotiates” the ways an analyst can access the encrypted data.

The recent media attention to Facebook and Cambridge Analytics underscores the concerns. Many marketing data mining operations monitor users’ activities and provide predictive information. When users receive banner ads or emails that says something along the lines of “if you liked product x you might consider these other products” data mining has produced that message. Some may not consider this a “privacy” issue, thinking it similar to stopping at the same coffee shop each morning on the way into their office building where the barista greets them by name and starts preparing their “usual” order.

Human actors have roles in both the way digital systems currently operate and in Data Escrow systems. The goal is not to be completely automated. Giving the user responsibility for their own escrow keys should facilitate user buy in, but it is not known if these users would have more confidence in the system.

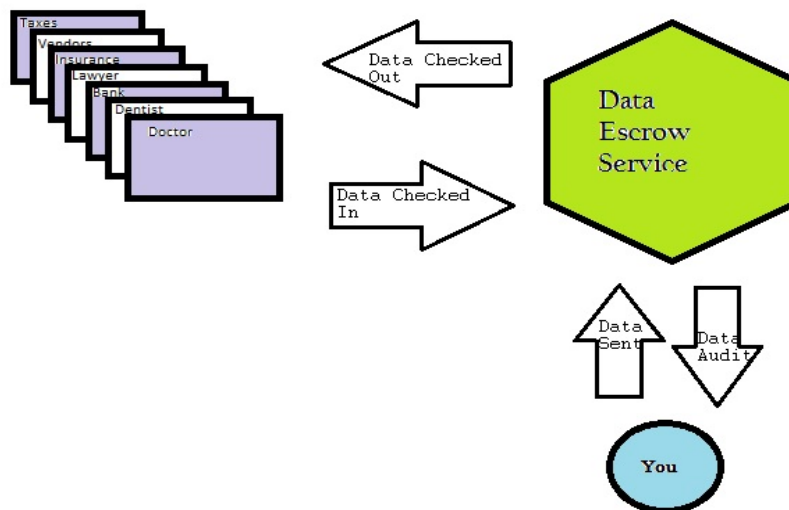
Ables and Ryan (2010) consider the interrelationship between societal security and individual privacy. Their orientation is that this interrelationship has “growing tension.” It must be noted that they are in the United Kingdom where government data collection is more open, noticeable, accessible and perhaps more extensive than what is experienced in other parts of the world. This yields an interesting question: how should data be managed when societal security needs have been met? Ables and Ryan (2010) recommend that data is held in escrow and call for the development of a means to track and approve the use of the data. This involves “digital envelopes” and the use of the Trusted Platform Module. They suggest that, in their case, the government of the United Kingdom act as the operator of the escrow system, since they are the collector of the data.

Data Escrow could resolve the issues of confidence, privacy, and security. People have trust or confidence in the financial system’s use of escrow, and these feelings may translate to Data Escrow. There is a societal expectation that the “you” which originates data have a reasonable right to the privacy of that data. It is also reasonable to expect that data about individuals are communicated and used in a secure and responsible way. Finally, it is reasonable for us to expect government use of data will protect both society and the individual.

Figure 2 illustrates the workings of a Data Escrow system. The Data Escrow service would be provided by an organization with attributes similar to a central bank. Its purpose is to operate the means of exchange for data via means similar to a central bank’s work with money. The perspective of this system is an overview from the perspective of both end users and stakeholders. While it may look simplistic, the result should be an advance over our culture’s current practices. The end user that is the subject of the data would be able to view, review, use and very importantly reuse both the data they provide and the data that is produced about them.

For organizations that produce data as a work product, a Data Escrow system could provide a greater access to temporal data (e.g. data that has been produced about a subject over time) and very likely a simpler means of restoring lost data in the event of a server or other problem. These and other improvements seem likely with an approach that focuses on providing a reliable system for data.

**Figure 2.** Data Escrow System



Current protocols, such as Secure Socket Layer (SSL), Trusted Platform Module (TPM), and Escrowed Encryption Standard (EES) provide data protection. These protocols could be integrated in a Data Escrow architecture, and new standards could be introduced by professional associations.

At present, IBM and the Internet of Things (IoT) Foundation (Claburn, 2014) have expressed interest in Data Escrow. Several companies offer data and technology escrow. One example is Iron Mountain, which provides source code and Data Escrow services to over 94% of the Fortune 1000 (Iron Mountain Incorporated, 2015).

## CONCLUSION

Data Escrow has two aspects that differ from other computing systems. One is the idea of a system for the “culture” or public. Typically, systems are built for specific circumstances and uses. Thus, when these systems are looked at in aggregate they appear, in a more generic cultural context, to disregard the needs of the “true” end users or the “you.” The second aspect of Data Escrow is that there needs to be a social guarantor. That is, for the “true” end user, or the “you,” to benefit from the expected utility may require a third party to insure this result. To that end, we believe Data Escrow meets all needs.

## AUTHOR BIOGRAPHIES

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# Teachers' Supports For Students Engaging In Mathematical Argumentation

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## ABSTRACT

*A wide agreement is that the teacher plays a crucial role in facilitating students' argumentation in primary classroom, in particular, when students engage in conjecturing activities. There is limited research on exploring what and how the different supports from the teacher could be in each stage of conjecturing. The purpose of the study was to examine how teachers support their students engaging in argumentation the classrooms where the teacher conducted in conjecturing activities. Students' use of valid argument does not come naturally and is acquired only through teacher's intentionally designing the lesson. Two teachers for this study were selected from the six teachers teaching in grade 3 to 6 participating in the teacher profession program that was designed to support teachers engaging in conjecturing in classroom. The main data consisted of audio- and video-tapes recordings, supplemented by the field notes and students' worksheet collected in classrooms. The results of the study indicate that teachers' supports in the validating stage of conjecturing for facilitating students' argumentation including clarifying, explaining, elaborating, and classifying the conjectures or claims into different categories. The teachers asked students different questions for scaffolding students different purposes of argumentation, such as validating one's own conjectures with data from other groups through supporting, defending, and rebutting.*

**Keywords:** Teachers' Supports, Mathematical Argumentation, Conjecturing, Validating

## INTRODUCTION

The importance of mathematics literacy has been drawn attention in recent documents within mathematics education. A crucial aspect of mathematics literacy in a fundamental sense is to ensure that students to have the competence of comprehending, interpreting, analyzing, and critiquing mathematical ideas. This indicates that mathematics education requires a reformed approach on learning and teaching. Mathematics is acquired by articulating clearly one's own thinking and challenging each other's ideas. Mathematics is a social process in which classroom is full of the discourse of arguing, rebutting, and disproving each other's ideas by providing evidence (Conner, Singletary, Smith, Wagner, & Francisco, 2014). Mathematical instruction should encourage students actively involving in discussing ideas, making convincing arguments and clarifying others' thinking (NCTM, 2000; CCSSM, 2010). Thus, mathematics instruction should go beyond knowledge of mathematics facts and emphasize on collective argumentation that enable students to use evidence to support their arguments.

Argumentation is a crucial process of knowledge construction in which individuals clarify, critique, construct, and revise ideas in an effort to make sense of the nature of world (Chen, 2011; Krummheuer, 2007). An argumentation, as described by Toulmin (1958/2003), involves the combination of claims, data, warrants, rebuttals, qualifiers, and backings. Claims refers to the statements whose validity is to be established, Data refer to the support provided for the claims. Warrants are the statements that connect data with claims. Rebuttals are the statements describing circumstances under which the warrants would not be valid. Qualifiers refer to the statements describing the certainty with which a claim is made. Backings are usually unstated, dealing with the field in which the argument occurs (Toulmin, 2003). However, students' use of valid argument does not come naturally and is acquired only through practice (Kuhn, 1991). Thus, we would argue that teaching mathematical argumentation through the use of appropriate activities and pedagogical strategies is needed to be considered carefully. Likewise, students' argumentation skills are very poor if there is no intervention in classroom contexts (Canadas, Deulofeu, Figueiras, Reid, & Yevdokimov, 2007). In order for student talk to be prevalent in the mathematics classroom, it is necessary to explore the roles of teacher with students and instructional strategies in classroom. Thus, the first author initiated a three-year research project of

teacher professional development program in 2015, the program was designed to support teachers for designing conjecturing tasks and carrying out the tasks into classrooms. This study is part of the project focuses on examining how teachers support their students engaging argumentation in primary classrooms.

## THEORETICAL FRAMEWORK

### Conjecturing Initiating Argumentation

In a designing-based conjecturing teacher professional program in which students' argumentation takes place, five stages of conjecturing of instructional approach were developed (Lin, 2018; Lin & Tsai, 2016). The components of argumentation to be initiated at each stage of conjecturing is described in Figure 1.

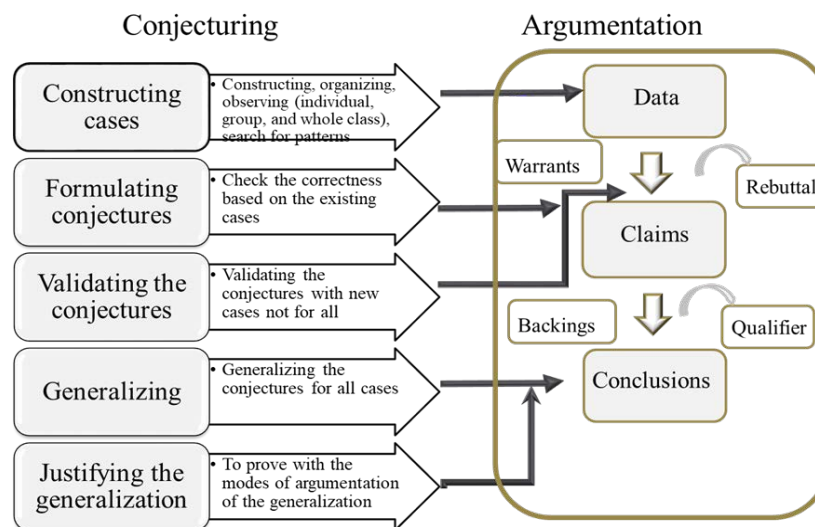


Figure 1: Conjecturing initiating argumentation (Cited from Lin, 2018)

The stage 1 is termed as *constructing*, which the cases were constructed by students themselves rather than by the instructor, because they are likely to motivate students to observe and search for patterns. Harel (2008) suggests that intellectual need, self-generated cases instead of cases given by teacher – arouse more curiosity and interested to look for patterns. Constructing cases, the first stage of the conjecturing, corresponds to the data of argumentation. Formulating is the second stage including searching for patterns and generating conjectures based on observing the cases. These claims or conjectures were likely to develop mathematical properties as target conclusions. The warrants occur in group discussions for sharing and checking the conjectures the students proposed in second stage of conjecturing. The cases constructed in the first stage contributed to the data as an argument for or against claims; the conjectures to be formed in the second stage corresponded to the claims. Validating tentative conjectures with new or more cases, the third stage, is a process of making claims and leading to the target conclusions. The validation of the claims does not always guarantee true for all cases. Thus, generalization is necessary to generalize the claims for all cases. When a conjecture is true but restricted to a domain, a qualifier is involved in the generalization. Generalization is the fourth stage. The qualifier as an element of argumentation occurs in the third and fourth stages of conjecturing. The justification with deductive reasoning based on what students have learned commonly arises in the final stage of conjecturing (Lin & Horng, 2017). Justifying the generalization, the final stage of conjecturing, corresponds to the target conclusions.

### Analyzing Teachers' Supporting in Students' Argumentation

Researchers agree that the teacher plays a pivotal role in orchestrating mathematical discussions (Hufferd-Ackles, Fuson, & Sherin, 2004; Stein, Engle, Smith, & Hughes, 2008). Before helping in facilitating students' argumentation

in mathematics classroom, teachers need to know how student learning occurs through argumentation. We adopted Chen's framework (2011) for analyzing teachers' supports in students' argumentation. In Chen's framework, construction and critique play an important role in argumentation. Construction is relevant to build and articulate knowledge. Construction consists of seeking information and elaborating. Critique referring to how students and teachers discuss each other's ideas includes: challenge, defending, supporting, and rejecting. Each component has a different emphasis on discussion or argumentation in classroom. Challenging is defined as a process of critiquing for understanding other's ideas with agreement or disagreement. Defending was defined as a process of validating claims for others by using evidence. Supporting is defined as a process of agreeing with one's own or others' claims with evidence. Rejecting is a process of disagreeing with others' ideas with evidence.

## RESEARCH METHOD

### Participants

Two teachers were selected from the six teachers teaching in grade 3 to 6 participating in the teacher profession program. The selection of the two teachers was based on the following two reasons. First, to compare the supports from teachers, it is better to teach in the same mathematics content. Only two (Fong & Sophie) of the six teachers teaching in the same grade 3 were selected. Second, they are different in academic background and profession in engaging conjecturing in classroom. Fong is an experienced teacher in teaching argumentation compared to Sophie described in Table 1.

**Table 1:** Two teachers' background in academic and profession

Fong (Experienced teaching argumentation)	Sophie (non-experienced)
Master degree in mathematics education	Master degree in science education
A certified elementary school teacher	A substitute teacher
19 years of teaching including 5 years in conjecturing teaching	15 years of teaching including 5 years in conjecturing teaching
Offering students 7-8 lessons engaging five stages of conjecturing	Offering students 2-3 lessons engaging the first three stages of conjecturing
Demonstrating conjecturing teaching in conference or forum	Never demonstrating conjecturing teaching in public

The two teachers taught in the same city, located in the middle of Taiwan. The class size is 27 in Fong class consisting of 15 males and 12 females and 26 in Sophie class consisting of 12 males and 14 females. The students in both classes were heterogeneous grouped of 4.

## DATA COLLECTION

The data were mainly collected from audio- and video- tapes of classroom observations and students' worksheet collected from classrooms. Each teacher was audio and video recorded while teaching the lesson of addition and subtraction of odd and even numbers. These audios and videos were transcribed word by word. The transcripts of video recordings to capture all the teachers' oral communication and interactions with students were used as primary data sources, supplemented by the field notes.

To focus on how teachers supported students engaging in argumentation in each stage of conjecturing, we paid attention to the questions asked by the teachers for facilitating students' argumentation. The analysis of the lesson transcripts was undertaken in two stages. The first stage was to compare the components of the argumentation generated in the classroom to determine what the support of the two teachers had offered to students over the lesson. Chen's (2011) framework and Toulmin's (1958) model of argument was used as an analytical framework to identify the components of argument in the speech and how the teachers offered the supports for facilitating the components. The transcripts of the 4 sessions of the lesson of each teacher were systematically analyzed for components of argumentation and teachers' supports.

The second stage was to determine how teachers' supports reflected to students' argumentation. Using a grounded approach with the transcripts of the two teachers, a coding scheme depicted in Table 2 was derived that focused on the teachers' supports needed to facilitate argumentation, such as explanation, supporting, and defending. The coding scheme was developed initially from the transcript of one teacher, and then applied to the transcripts of the other teacher to seeking for the constant of the codes. Due to the limitation of pages, only the supports from teachers for students' argumentation in the third stage of conjecturing teaching will be reported in the following result section of the paper.

**Table 2:** Coding scheme of teachers' supports for facilitating students' argumentation in the first three stages of conjecturing

Stage of conjecturing	Teachers supports for students' argumentation	
	Construct	Criticize
Validating	<ul style="list-style-type: none"> <li>● Clarify the claims/conjectures</li> <li>● Explain the claims/conjectures</li> <li>● Elaborate the claims/conjectures</li> </ul>	<ul style="list-style-type: none"> <li>● Classify the claims/conjectures</li> <li>● Support the claims/conjecture with one's own data or from other's data</li> <li>● Defend the claims/conjectures</li> <li>● Rebut other's claims</li> </ul>
Generalizing	<ul style="list-style-type: none"> <li>● Extending to more cases or examples</li> <li>● Using the premise or restricted condition</li> <li>● Utilizing the universal quantifier (e.g., all, any)</li> </ul>	
Justifying	<ul style="list-style-type: none"> <li>● Exclusive of enumerating</li> <li>● Justification by analogical reasoning</li> <li>● Justification by deductive reasoning</li> </ul>	

## RESULTS

It is found that the supports from the two teachers for facilitating students' argumentation in the validating stage of conjecturing teaching were identified two categories: constructing and criticizing knowledge. These two have close relationship. The construction is for preparing the argumentation, while the criticizing enhances the knowledge construction.

### Teachers' Supports for Facilitating Students' Constructing Knowledge

The constructing knowledge related to building new concepts was used by the two teachers for preparing the argumentation, including clarifying, explaining the conjecture they proposed in the second stage of conjecturing, and elaborating the mathematical language involving in the conjectures.

#### *Clarifying Students' Claims/Conjectures*

In the whole class discussion for validating conjectures, while the different group-conjectures were to distinguish and were to be compiled into the whole-class- conjectures, the two teachers asked different questions for helping students to clarify what difference and similarity between the group-conjectures from different groups. The question was like: "Are the two conjectures same?" For instance, the students in group 3 in Sophie's class, put forward the conjecture that "Even and even numbers are equal to even number.". She asked students by a question "Was there a similar conjecture? The students in group 6 gave a conjecture "Even number minus even number equals even number.". Then, Sophie intervened by ask question for whole class students as "Are the two conjecture same?" The teacher's support was to help students to clarify the difference between the two conjectures.

While compiling into whole-class conjectures from group-conjectures, Fong asked students if the two group-conjectures "Even plus odd is equal to odd." and "Odd plus even is equal to odd." from group 2 are the same. She first asked students in group 2 if the two conjectures were relied on the data from their own group. Students in group 2 provided two cases  $99+38=137$ ,  $98+21=119$  for corresponding to the two conjectures and said that "The two conjectures are different.". Fong then invited other groups and then asked: "Do you have other cases to support the two conjectures respectively?". The cases " $85+32=117$  for "Even plus odd is equal to odd." was given by students in group 7 and  $22+21=43$  for "Odd plus even is equal to odd." given by group 1. In this scenario, the teacher's support

was to help students to clarify the difference between the two group-conjectures.

### *Explaining Students' Conjectures*

In the whole class discussion for validating conjectures, while the conjectures to be articulated were not clear and incomplete, the teachers gave a help for students to explain clearly. The supports were not by asking questions instead by imperative mod, such as "Please give us the cases for supporting your conjecture." and "Please explain it."

### *Elaborating Students' Conjectures*

Elaborating the similar conjectures was used by the teachers after they helped students validating the correctness of the similar conjectures. The supports from the teachers for students were the questions to be asked, such as "Which of these conjectures is most complete to be saved as the target conjecture?", "Which of the conjectures is compiled to others'?", or "How can we modify the conjectures into the whole-class-conjectures?". The purpose of the teachers' support was to help students to elaborate the mathematical language in describing the target conjectures.

### **Teachers' Supports for Facilitating Students' Argumentation**

The conjectures in the formulating stage could be non-data conjectures, incorrect conjectures, non-true conjectures, and true conjectures. Non-data conjecture was the conjecture without relying on the data. Incorrect conjecture was rationally incorrect, even though it is based on the data. Incorrect, non-true, and true conjectures were the conjectures relied on the data. Non-true conjecture was the conjecture to be true for some cases, while true conjecture was the conjecture to be true for all cases. The criticizing knowledge were related to how students and teachers discuss each other's ideas including classifying, supporting, defending, and rebutting the conjectures. The data seeking for claims were identified as two aspects: (1) based on their own, (2) based on other groups.

### *Classifying Students' Conjectures*

After checking the conjectures, the teachers asked students to compare if they had the same or similar conjectures and then classified into different categories. The questions they frequently asked were: "Do you have the same or similar conjectures as this?", "Is there any conjectures like this?", "The purpose of the teachers' support was to classify the conjectures into different whole-class-conjectures.

### *Supporting Conjectures with Data*

To help students to have mathematical literacy, they need to learn to be a person whose speech must rely on reasonable evidence. In the validating stage, supporting conjectures with data was one of the foremost supports for the teachers' facilitating students' argumentation. The data could be one's own or from others'. The teacher asked students who were reporting the conjectures to ensure where the conjecture was come from by the questions: "Where do you find out the conjecture?" "Could you tell us where the conjecture come with the cases?", "Would you please to help me check if the conjecture is still true in other group data?". One episode from group 5 is excerpted from Fong's class as follows.

- 6 S<sub>G5-23</sub> I found that even plus even numbers is equal to even.  
 7 T Could you tell us where the conjecture come with the cases?  
 8 S<sub>G5-23</sub> Here even(98) plus even(70) is equal to even (168).  
 (20180307, Fong, video)

S<sub>G5-23</sub>: #23 student in group 5, T: teacher

The other episode is the discussion of non-data conjecture from group 1 as follows.

Group5-Data

- 148 SG1-12 Odd plus odd is equal to even.  
 149 T I would ask you why it is minus? Where do you find out this?  
 150 SG1-14 No case can support this in our group.  
 151 T What?  
 152 SG1-12 This is my note. (20180307, Fong, video)  
 (20180307, Fong, video)

Group1-Data

### Refuting Conjectures with a Counter Case

Refuting other group's conjectures required teachers' support for students when the conjecture is incorrect. The supports from teachers were by asking the questions, such as: "*The conjecture is only for the data in your group, is it line with other groups'?*", "*Let's check together, any problem do you find out?*". The purpose of the supports from teachers was for supporting the true conjectures with a few new cases, refuting the non-true conjectures with some cases, qualifier the non-true conjectures to be true conjectures. The following episode is from group 6 in Sophie's class.

- 161 SG6-3 If added is odd, then the sum is odd.  $15+12=27$   
 162 T Take a look. Do you find out any problem?  
 163 SG3-20 Yes.  
 164 T What is the problem?  
 165 SG1-12 Other counterexample makes it wrong. (20180413, Sophie, video)

After students in group 6 put forward the non-true conjecture: "*If added is odd, then the sum is odd.*", which is supported by the example  $15+12=27$  (line 161), Sophie gave a support for the group by asking: "*Take a look. Do you find out any problem?*" (line 162). The students realized that the non-true conjecture is true only for some cases in the group 6, but it is not true for some cases in other group (line 163 and 165).

### Defending Conjectures

When the true or non-true conjecture could be questioned or disagreed by others, the teachers asked students to make a defense. If the conjecture to be defended, then the support from the teachers was for clear articulation. When the conjecture was non-true or false, the support from the teachers was for facilitating students' understanding about refutation. Furthermore, the non-true conjecture was turned out to be true conjecture under the restricted condition.

In Sophie class, students in group 3 put forward the conjecture "*Even plus odd number is equal to odd numbers.*". The other student in group 5 proposed the other conjecture "*Odd plus even number is equal to odd number.*". The students in group 3 refused the #5 student in group 5 (line 128). Sophie asked the student to ensure if the two conjectures are the same or different (line 132). Finally, The #5 student defended with fail and revised his incorrect idea (line 137). The episode is described as follows.

- 128 S<sub>G5-5</sub> Odd plus even number is equal to odd number.  
 129 T Give me the evidence. What the data can support your conjecture?  
 130 S<sub>G5-5</sub>  $1+12=13$   
 131 S<sub>G3-25</sub> His is the converse of [Even plus odd number is equal to odd numbers.]  
 132 T What is the converse?  
 133 S<sub>G3-25</sub> One is odd plus even, while the other is even plus odd.  
 134 T Do any of you agree with Jack's[S<sub>G3-25</sub>] saying?  
 135 S<sub>G5-5</sub> No.  
 136 T You disagree your own. Say more.  
 137 S<sub>G5-5</sub>  $1+12=13$  and  $12+1=13$  are different, excepting the answer 13 is the same.  
 (20180413, Sophie, video)

### The Conjectures Validated by Each Teacher's Supports

In the formulating conjectures stage of conjecturing, 22 group-conjectures were proposed in experienced class and 17 group-conjectures were proposed in non-experienced class, seen in Table 3. The students in experienced conjecturing teaching had more opportunities engaging in argumentation. For instance, 7 group-conjectures were validated through the experienced teacher's supports by asking questions for clarifying, explaining, and elaborating, supporting, and defending. 3 group-conjectures were rejected by the experienced teacher's supports for defending and refuting. On the contrary, 3 group-conjectures were validated through the non-experienced teacher's supports by asking questions for clarifying, explaining, and elaborating, and supporting. 1 group-conjectures were rejected by the non-experienced teacher's supports for defending and refuting. There were 6 whole-class-conjectures finally agreed by the students in whole class through the experienced teacher's supports for classifying and revising, and elaborating.

**Table 3:** The Number of Conjectures Validated by Each Teacher's Supports

Conjectures to be validated	Fong's class (experienced)	Sophie's class (non-experienced)
<b>Group-conjectures proposed by groups</b>	<b>22</b>	<b>17</b>
<b>Group-conjecture to be discussed</b>	<b>10</b>	<b>4</b>
Validated conjectures by data	7	3
Refuted conjectures	3	1
<b>The conjectures from other group to be classified</b>	<b>12</b>	<b>8</b>
Validated conjectures by data	10	7
Refuted conjectures	2	1
<b>Whole-class conjectures</b>	<b>6</b>	<b>4</b>

### CONCLUSIONS AND DISCUSSION

This study contributes to a greater understanding of how teachers offered the supports for facilitating students' argumentation from group-conjectures to whole-class conjectures. The teachers' supports for facilitating students' argumentation were by asking question or imperative mod for clarifying, explaining, elaborating, classify, supporting, defending, and refuting. The truth or correctness of a non-true or true group-conjecture was more readily to be warranted by elementary school students with the data they constructed in the first stage of conjecturing teaching. This is the feature of the study facilitating students' argumentation by engaging in conjecturing activities.

Facilitating productive students' collective argumentation in classroom can be a difficult enterprise for many teachers. This is not the case of the study This study contributes to how the questions to be asked for students for supporting them to clarify, explaining, elaborating, classifying, supporting, defending, and refuting when the conjectures were discussed in the whole class. The questions to be asked for students for supporting them to clarify and explaining the meaning of the conjectures could be: "Are the two conjectures same? For supporting students in elaborating a conjecture, the questions to be asked could be: "Are the two conjectures same? ""Was there a similar conjecture?". "Which of these conjectures is most complete to be saved as the target conjecture?", "Which of the conjectures is

compiled to others'?", or "How can we modify the conjectures into the whole-class-conjectures?" For classifying the conjectures, the questions to be asked could be: "Do you have the same or similar conjectures as this?", "Is there any conjectures like this?". For supporting a conjecture with a warranted data, the question to be asked could be: "Where do you find out the conjecture?" "Could you tell us where the conjecture come with the cases?", "Would you please to help me check if the conjecture is still true in other group data?". For refuting a false conjecture, the questions could be asked as: "The conjecture is only for the data in your group, is it line with other groups'?", "Let's check together, any problem do you find out?"

The results indicate that the teachers helped students engaging in conjecturing activities with productive mathematics discussion. It can be explained by the conjecturing tasks with high cognitive demands, suggested Stein, Silver, and Smith's mathematics task framework (2005). The framework outlines three different phases that tasks pass through. First, students were given a conjecturing task designed by the teacher for argumentation taking place. It was followed by how the teacher presented the conjecturing task to the class. Finally, the students actually engaged in the conjecturing activities with five stages. The former stage is for the preparation of the latter stage of conjecturing. When teaching with conjecturing approach, it created the opportunities for the teacher to listen to students and students listened each other carefully, and then the teacher assisted students learning from their level of understanding and engaging in argumentation.

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# Thriving Through Empathy In A Volatile, Uncertain, Complex, And Ambiguous World

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## ABSTRACT

*Technology continues to irrevocably alter the global landscape, creating a volatile, uncertain, complex, and ambiguous (VUCA) environment. In a world of intricately intertwined dynamic networks, competing or differing interpretations of contexts, and rapidly iterating technology, the world's need for empathy is paramount. Looking at this VUCA environment through the framework of creative destruction, innovations developed in this accelerated technologically-driven landscape will continue to be rapidly disrupted by new technologies, with new methods of production and of distribution making the old ones obsolete, much as the railroad system decimated the canal and turnpike systems. In the 21<sup>st</sup> century, the pace of innovation has accelerated.*

*This dynamic VUCA ecosystem challenges leaders but at the same time offers a great number of opportunities. Through advances in technology, the world and its multitude of cultures are more accessible, enabling people to witness events as they are happening, even if thousands of miles away. Furthermore, with organizations such as SpaceX working to transport anyone in the world to any location within minutes, gaining proximity will no longer be a barrier. In the face of this ever-shrinking geographical gap, empathy is a driver of impact. The uncertain nature of this volatile environment not only opens more opportunity, it also has the ability to create more challenges. With technology disrupting production chains through automation, potentially creating deficits within demographics, empathetic leaders can help forge the path to systemic solutions in which to drive change. As the VUCA landscape continues to disrupt societal structures, empathetic leaders who step forward will enable these communities and people to thrive.*

# Corporate Risk Management: Insurance Coverage For Contractual Liability

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## **ABSTRACT**

*Risk allocation takes center stage in nearly all commercial negotiations. In these negotiations, each party seeks to minimize the risk attributable to itself, while maximizing return. A common contractual vehicle for managing risk allocation is an indemnity provision. Indemnity provisions shift legal responsibility for injury or damage claims to other parties. Once the deal has been struck allocating risk between the parties, often with the use of an indemnity provision, insurance should be obtained. Attention should be given to the coverage such a policy provides for indemnity provisions in order to spread the risk a second time – this time, between the corporate entity and its insurer.*

# The Economic Impact Of The Pinnacle Trails In A Kentucky Trail Town

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## ABSTRACT

*The Pinnacles at Indian Fort Theatre is located in a rural Appalachian city and is the number one attraction in the city of Berea Kentucky ([https://www.tripadvisor.com/Attractions-g39187-Activities-Berea\\_Kentucky.html](https://www.tripadvisor.com/Attractions-g39187-Activities-Berea_Kentucky.html)). The purpose of this study was: 1) to collect trail user information and to compare the economic impact of the trails in 2017 as compared to 2018. Intercept surveys (Cook, O'Brien, Jackson, Findley, & Searcy, 2016), hand counts and infrared sensors were used to estimate the number and type of trail users. Infrared sensors gathered estimates of trail use from June 2017 – June 2018. In the summer of 2017 and 2018, intercept surveys were completed for 12 hours over four different days during months of May, June and July. Participants were asked to complete a 15-question survey either before or after their trail use. In 2017, 82 surveys (51% male, and 49% female) were completed. Residents included 23% of those surveyed, and 77% of people were from out of town or out of state. Trail users averaged \$6.06 per person (range \$10-\$60). In 2018, a total of 186 people were surveyed (89 males and 97 females), and non-residents composed 69% of the sample. The average of money spent in the city of Berea increased to \$15.83 (range \$2-\$275). In 2018, there were two main improvements, 1) the percentage of trail users spending money in the city increased and 2) the average expenditure per person also increased. Future data will provide annual usage, frequency, and expenditures as there will be a connection of other trails to this major tourist attraction.*

**Keywords:** Economic Impact, Physical Activity, Trail Use, Outdoor Recreation, Tourism

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# Culturally-Responsive Science Teaching (Crest) At Home: A Workshop For Parents Of Cultureally And Linguistically Diverse Children

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## ABSTRACT

*As elementary classrooms become increasingly diverse, science achievement gaps between minority and mainstream children are a great concern and must be reduced. Previous studies supported that culturally responsive instructional models provide culturally and linguistically diverse (CLD) children equitable science learning environments. To maximize the CLD children' learning, home and school environments should connect and parents need to play a role not only in communicating and receiving information, but also in shaping the thinking process of their children. This study is designed to develop a workshop for parents of CLD children, Culturally-Responsive Science Teaching (CReST) at Home, and measure its effects on the parents' understanding science, integrating science with culture, and improving confidence of teaching science at home. The data collected from the survey completed with the parents at the end of the workshop resulted that the CReST at Home expanded educational opportunities for, and improve academic attainment of the parents of the CLD children in science and multicultural education at home.*

**Keywords:** Culturally-Responsive, Science Teaching, Parents, Culturally And Linguistically Diverse, Early Childhood

# The Payer Mix For New Freestanding Emergency Centers In Texas

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## ABSTRACT

*A Freestanding Emergency Medical Care Facility is defined as a medical care facility that is structurally separate and distinct from a hospital that provides emergency care (Texas Department of State Health Services, 2017). The 81<sup>st</sup> Texas Legislature enacted the Texas Freestanding Emergency Medical Care Facility (FEC) licensing act; this act allowed for the FEC industry to develop in Texas. The act was intended to increase emergency care options in rural areas. Since 2010, there have been hundreds of FECs opened in Texas with the majority being located in a zip code with a higher than average of individuals that have private insurance (Schuur, Baker, Freshman, Wilson, & Cutler, 2016). An FEC is a business and their profitability is determined by visit volume and profit margin per visit (Schuur, Baker, Freshman, Wilson, & Cutler, 2016). By selecting zip code locations with high private health coverage (employer based or direct-purchase) and higher median income, the FEC is increasing their potential for profitability. Due to the continued growth of FECs, Texans have increased visits to FECs with a resulting increase in health care cost. Therefore, it is important to understand the relationship between the healthcare payer mix and zip code location. The focus of this research is on the newly licensed FECs in Texas between September 2017 to July 2018.*

**Keywords:** Freestanding Emergency Medical Care Facility, FEC Market, Payer Mix

# Transitioning From Professor To Professor Emerita: Lessons Learned

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## ABSTRACT

*Four aspects of retirement are described in this paper, which summarizes the experience of a professor who recently retired. Aspects of satisfaction, transition, self-discipline, and teaching are discussed to frame her post-retirement life. The author determined that retirement is a period of happiness and satisfaction with having more leisure time, flexibility, and less pressure. Phased-in retirement was preferred because it provided time for planning and psychological acceptance. Self-discipline was noted to be a critical skill to harmoniously balance career-life issues and time demands. Teaching on a part-time basis or engagement in consulting, which is a form of teaching, is a high priority for retirees. Conclusions consistent with the primary theories of career development are discussed. Implications for maintaining physical and mental health and keen mind are presented.*

**Keywords:** Retirement, Satisfaction, Self-Discipline, Teaching, Phased Retirement

## INTRODUCTION

The purpose of this paper is to describe the retirement life of a Professor of Computer Information Systems who recently left her tenured university position. The author had two primary goals in mind as she drafted this manuscript. The first was to provide a mini-case study detailing aspects of retirement that address four questions. The second was to discuss the implications of the case findings by providing professors contemplating retirement with a picture of life after the academy. The insights described provide some modest information about possible future retirement patterns. They also suggest that retirement for university professors, if properly managed, is a pleasurable and vital experience.

According to a planning study conducted by Northwestern Mutual Life Insurance Company, the average age at which people retired is 59, of which 72% state they are fully retired from working. For those still working, the average age they expect to work until is 68. Furthermore, 45% say they will continue to work in retirement because they choose to do so. The Northwestern study noted a gap between expectations and experience with 37% of working adults saying they expect to be happier after they retire than currently. A large portion (84%) of current retirees say they are quite happy in retirement and most of these state they are happier now compared to when they were working. Of those retired, 70% say their lives are fulfilled, and most of those individuals focus on health and fitness and do charity work. The Northwestern Mutual study underscored a link between self-discipline in financial planning and personal happiness in retirement. Retirees who identify themselves as self-disciplined planners (93%) are more likely than non-planners (63%) to say that they are happy in their retirement years (Northwestern Mutual, 2014).

In a 2016 Money magazine article, couples reported differences in what they want to do in retirement. Connecting with family, socializing with friends, volunteering, and taking classes were activities preferred by women, whereas engaging in sports, participating in outdoor activities and working full-or part-time were preferred by men (Wang, O'Brien, & Renzulli, 2016, p. 51). These differences are important because harmoniously managing them with one's spouse requires self-discipline, willingness to compromise, and effective time management.

In 2015, Rapoport, Finlay and Hillan studied faculty at the University of Toronto and found that female professors more often adjust their retirement plans to suit those of their significant others. In this same study the researchers found that female academics often begin their careers later in life than males and thus more frequently experience truncated career tracks, which explains in part why pensions of female professors are often smaller than pensions for

the males. In an effort to increase their pensions, female faculty may be more likely than their male counterparts to work past the traditional retirement age of 65.

Because retirement is a major milestone in life and little is known about the activities and thinking of professors who retire, the author decided to develop this paper. While some may think that retirement is a bittersweet event, the findings of the Northwestern Mutual study show that retirees who plan for their senior years experience a great deal of happiness, more so than they experienced while working. Because the statistics report only numbers about retirement, satisfaction, and happiness, it is hoped that this qualitative paper will fill in some of the gaps and explain the areas in which retirees experience satisfaction, dissatisfaction, happiness, and unfulfilled needs. Not every aspect of retirement will be addressed in the pages that follow. Instead, the author will provide answers and insights into four intriguing questions.

This paper is organized into three sections. The first presents the four questions to be addressed in the case study description of the author's recent journey into retirement. Definitions of important terms and a review of the literature on the adult stages of career development will be provided. The second section describes the personal experience of the author who retired about two years ago. Her experiences will be framed in terms of the four questions established for this paper. The third section provides some conclusions and a discussion of the implications of the case study for future retirees.

### **RETIREMENT QUESTIONS ADDRESSED**

Retirement can be examined from several perspectives. This paper focuses on four questions that will help explain the life experiences of a university professor who retired from her position in the last 24 months. Prior to stating the focal questions, it may be prudent to define what is meant by retirement, describe how it fits into the literature on career development, and provide the underlying rationale for this paper.

#### **Definition and Description**

Retirement can be defined as the point in life when an individual stops employment completely. One definition suggests that retirement is the withdrawal from one's occupation, office, or business. It occurs when a person stops working (American Heritage, 2016). Another definition holds that it is the point when one leaves his/her job and ceases to work, because he/she has attained a particular age (Compact Oxford Dictionary, 1991). While these definitions suggest that retirement involves the complete cessation of work, it is possible for a person to pursue a state of semi-retirement by reducing the number of hours one chooses to work.

Some individuals choose to retire when they are eligible for public or private pension benefits, while others are forced to retire when their health no longer allows them to continue working. In certain cases this may be the result of an accident or illness. In most countries, the idea of retirement is a fairly recent occurrence, being introduced during the late 19th to early 20th centuries. In the more distant past, a lower life expectancy, coupled with the absence of financial arrangements such as pensions, meant that working individuals continued their employment until death. The first country to introduce retirement as a formal arrangement was Germany, in 1889.

Retirement might correspond with important life changes. For example, a retired worker might relocate to a warmer climate and/or a retirement community. This may result in less contact with one's previous social network and a change in lifestyle. Retirees often volunteer their time for community and charitable organizations. Tourism is another common activity in retirement, becoming a way of life, especially for individuals that have become known as grey nomads.

Americans have many possible lifestyles to choose from as they grow older. Some continue to work full time, some work part time while others stop working and enter full retirement. Some may move between these categories and adjust their leisure activities as needed. There are several reasons why some people choose not to retire or return to work after retiring. They include the complexity of planning for retirement, expenditure of mental and physical energy, social interaction, and status. These factors may influence an individual's decision about whether and how much to participate in the work force.

It has occasionally been reported that retirees may feel fidgety and suffer from depression because of their new circumstances. Although it is not scientifically possible to prove that retirement contributes to depression, the recently retired are among the most susceptible societal groups experiencing depression, perhaps due to a confluence of increasing age and declining health. (Jacobs, 2013). Several studies have shown that healthy retired and elderly people are as happy or happier and have an equal quality of life as they age compared to younger employed adults (Taylor, Morin, Parker, Cohn, and Wang, 2009). In sum, retirement by itself is not likely to contribute to the development of depression.

### **Retirement and Theories of Career Development**

The basis for this paper is rooted in the literature summarizing the life stages of career development. It begins with the 1950's work of Erik Erikson (1963). He identified three life stages with several psychological dilemmas that confront individuals. The first is early adolescence to early middle age, where a person faces the dilemma of intimacy vs. isolation. The second stage is middle age where the dilemma is generativity vs. self-absorption. Here the individuals must choose between developing concern for the well-being of individuals outside of one's family, including co-workers, or remaining absorbed in self. Failure to engage in generative activities would leave one feeling stagnated and bitter. The third stage, old age, is one involving the conflict between integrity and despair. Integrity involves the sense that various aspects of life have become integrated and satisfying. Despair is the feeling that matters had not turned out as one had hoped, and it was too late to do much about it.

Daniel Levinson (1978) discusses how adult life has periods of transition and stability. Transitions often mean stress and uncertainty, but stable periods offer the opportunity to focus and reaffirm commitments. In the late adult transition, experienced by most people between age 60 and 65, individuals anticipate changes that are likely to have a major impact on one's self and relationships. For some, this is a time of both deep introspection and pain avoidance. For many, age 65 or so is a time to assess the meaning of one's existence so far and a time to create a new life structure. Miller and Form (1951) describe five career phases and career development patterns throughout an individual's lifetime. In their work, they identify the preparatory work phase from the time people are born until they are socialized by parents and schools. The initial work period is from age 15-18 and consists of the time one starts the first part-time job until one accepts a full-time job. Between the age of 18 and 34 is the trial work period when one gets the first "permanent job." From age 35 to 65 is the stable work period characterized by long-term dedication to "the kind of work that I've always wanted" or to accepting the fact that one will not find it. Finally, at age 65, one encounters the retirement period, characterized by anthropologists as having four common psychological goals. They are (1) to live as long as possible; (2) to remain active in personal and group activities; (3) to protect the privileges and assets amassed over one's career; and (4) to withdraw from life respectably with high expectations about the next life. Because some individuals do not accept the fourth goal, they develop pessimistic attitudes toward retirement and their late adult years.

Donald Super (1957) expanded career theory and the work of Eli Ginzberg. He saw five stages of career development beginning with growth (age 0-14), which consists of fantasy and role-playing; exploration (age 15-24), which involves making tentative choices and entry into the labor market; establishment (age 25-44), where one settles down and possibly changes occupations; maintenance (age 45-66), which involves holding on to what one has achieved; and decline (age 65 onward), in which an individual begins to retreat from work and begin movement out of her/his career. A common characteristic of the various theories of career development is a cyclical pattern. In some theories, adults experience alternating stages of stability and transition. In others, careers are characterized by alternating trial and stable work periods. Another feature of each theory is the idea that careers come to an end, i.e., individuals retire. At that point, they engage in a battle between integrity and despair, which is the attempt to either create meaning for their existence or retreat from work. They also develop prospects for their after-life. This paper examines retirement for university professors against the theoretical backdrop that withdrawal from work and career is the inevitable outcome of a well-invested life.

### **Rationale for this Paper**

The reason for developing this paper stems from a desire to preserve the mental faculties of professors, especially those in retirement. They are individuals whose career was based on having a keen, active mind and an advanced

knowledge of a particular field. The preservation of cognitive functioning has been the subject of psychological and medical research that has challenged the old assumptions about brain capacity. Yossi Halamisch, a physician who studies the workings of the human brain, maintains that having a keen mind does not necessarily deteriorate with age. While the number of brain cells decreases as one goes beyond the age of 25, what is more critical to keeping sharp is neural connections (Halamisch, 2016). Halamisch likens the process of thinking to software that is programmed to allow people to engage in the activities of life. To keep cognitive function at a superior level, while cellular count decreases, Halamisch advocates that retirees should update (or reprogram) their software to increase the number of mental connections. By doing so, retirees can preserve their mental capacity, the element of human capital on which their professional career was based. Suggestions on how to update one's mental software will be discussed in the Implications section of this paper.

### **The Four Focal Questions**

The mini-case study below examines the recent retirement of the author by focusing on four questions. They are:

1. What aspects of retirement provide the most and least satisfaction?
2. Should a professor opt for full retirement or semi-retirement, i.e., should disengagement be commenced quickly or phased in over a period of time?
3. Why is self-discipline a critical skill in retirement?
4. What role does teaching play in a professor's life as a retiree?

### **MINI-CASE STUDY OF DD, A RECENTLY RETIRED PROFESSOR**

DD's long-time objective in adulthood and during retirement has been to live a five-star life style. The five points on the star are:

- 1) Health (physical, mental, emotional)
- 2) Career and professional growth
- 3) Financial health (income including salary, consulting, investments)
- 4) Social life (family, friends, colleagues)
- 5) Spiritual and intellectual gratification (individually or as an institutional member)

DD retired two years ago from a mid-sized state university in California after serving 40 years as a professor of computer information systems in the College of Business and Economics. Her last five years, from age 66 through 71, entailed participation in the Faculty Early Retirement Program (FERP) whereby she performed her usual academic responsibilities of teaching, research and university services on a half-time basis.

### **What Areas Are of Most and Least Satisfaction?**

The reduced teaching load during her last five years allowed DD to devote more time and energy to research and writing which resulted in the most productive publishing period of her entire career. DD also felt freer to enjoy the reduced teaching load and to engage more with her students – especially her highly motivated students. She also continued extensive university service which ranged from the academic senate to faculty committees to student advising and mentoring student clubs. DD also enjoyed the challenge of being an administrator (Director of MBA and most graduate programs in business) as she approached the end of her academic career. DD has found research and writing to be highly satisfying and continues to actively research and write after ending her official academic career. During her FERP years DD enjoyed an increase in discretionary time and began exploring alternative approaches to retirement living. She toured several retirement communities in California and her home state of Washington. Ultimately, she decided on an age-55-plus community in the same city, a suburb of San Francisco, where she had lived for over 40 years. She put a deposit on a new condominium to reserve it about a year before it was scheduled for completion and ready for occupancy. During this period she prepared for downsizing from a 2700 square foot waterfront house to a 1756 square foot condominium. When the condominium was essentially complete in July 2017, at the age of 72, DD sold her home for considerably more than the cost of the condo and proceeded with moving into the condo. This freed up some home equity for investment and production of income throughout retirement. By

downsizing DD could afford to continue living in the community she considered home. The San Francisco Bay area is recognized to be among the most expensive areas to live in the USA. In fact, a couple of DD's friends joked that given her meager professor salary DD might have to retire to Bangladesh. Fortunately for DD, she can now afford to live near San Francisco on her retirement income comprised of social security, a university pension plus investment income. Knowing this, she feels satisfied and secure. DD admits that disposing of many possessions, moving and even setting up phone and Internet service proved to be a much bigger challenge than she had ever imagined. Parting with many memories can be tough but this also clears the way for new experiences. Overall, the need to confront financial reality and the decision to downsize was difficult and among DD's least satisfying experiences in retirement. Furthermore, the time-consuming move took away from the time DD would like to have spent pursuing other activities including traveling, reading, consulting, volunteering and exercising. In sum, the numerous hurdles encountered during the downsizing process were dissatisfying.

### **Should Professors Opt for Full Retirement or Semi-Retirement?**

During her five years in the FERP program, DD enjoyed her increased discretionary time and began to live a mostly balanced life thus brightening her five-star life style and satisfaction with her life. The five years of phasing into retirement allowed the opportunity to focus on what she wanted from retirement, to travel more and to identify rewarding academic and volunteer opportunities. DD currently volunteers for eight organizations: as a docent/volunteer for the Computer History Museum in Mountain View (since year 2003), as a member of the advisory board at Golden Gate University's business school in San Francisco, as a member of the advisory board for the undergraduate programs at Golden Gate University, as a member of the board for the Hillbarn Theatre in her community, as a general volunteer for San Francisco Ballet, as a volunteer for Broadway by the Bay in Redwood City, as a member of the Innovation and Technology Citizen Advisory Committee (ITAC) in her local community, as a member of the Community Emergency Response Team (CERT) in her local community, and as a member of the community outreach/social committee for her homeowners association. Since joining the FERP program DD has enjoyed extensive travel as well as attending cultural events in the Bay Area with many wonderful friends, most of whom she has known for decades. As a professor emerita, DD continues to enjoy the intellectual stimulation of research and writing and finds it to be spiritual in some ways.

Over two years ago DD was invited to join the advisory board for the Ageno Business School at Golden Gate University (GGU) as well as the advisory board for the undergraduate programs at GGU. The advisory boards meet three to four times a year and participate in strategic planning for the school. Due to her academic background, DD served as a member of a tenure review committee. She has also served on committees for selecting the faculty member most deserving of an endowed position. At GGU the endowment funds are used mainly to support research. DD recently chaired two of these selection committees. DD finds that intellectual and social interactions with the academic community are among her most gratifying experiences.

DD also increased her frequency and enjoyment of leisure travel since starting the FERP program. Vacation trips have included a Russian river cruise, an extended tour of India, travel with a group through the Netherlands, Belgium and France, Peru, Ecuador, the Galapagos Islands, Germany, Czech Republic, Poland, Austria, New York City, a cruise to Alaska, Sun Valley ID, Seattle to visit friends and family, Minnesota to host a reunion of cousins, as well as shorter trips to Palm Desert, Sequoia and Kings Canyon National Park, Lake Tahoe, and Ashland Oregon for the Shakespeare festival. DD has also found business travel to be easier since entering the FERP program and has traveled extensively to make presentations at conferences including China and Tibet, England, Scotland, Orlando FL, Wilmington NC, Nashville TN, Las Vegas NV, and San Diego CA. She also spent nearly a month in Tunisia as a Fulbright Specialist/Scholar followed by a vacation in Egypt. Travel presents wonderful opportunities for lifelong learning. The FERP program made staying productive while easing into retirement and post-retirement activities much easier. DD has become a strong proponent of semi-retirement for professors and hopes that more employers will offer optional phase out programs in the future.

### **Why is Self-Discipline a Critical Skill?**

Throughout her adult life DD has been keenly aware of the importance of self-discipline to using her time effectively, maintaining physical health, mental health and acuity, career-life balance and adequate financial resources.

*Physical Health*

As DD phased into retirement and downsized her living space, she also downsized her body and shifted attention from career to other matters including self-care and health care. She enjoys her flexible schedule and finds more time now to work out at the gym, take exercise classes two to three times a week, attend a weekly meditation class as well as plan and prepare healthy meals. DD also takes frequent walks, bicycles and dances occasionally. The increase in physical activity has led to desired weight loss so DD has downsized both her body and domicile. She feels better than ever both physically and mentally.

*Mental Health and Acuity*

DD comes from a small family so cultivating personal and professional friendships has always been very important to her. During retirement she notices having to make more effort to interact socially than she did when working full time. She has noticed that she becomes invisible as she ages. More social isolation has not led to depression for DD. She is grateful for being able to avoid the need to adjust to having a spouse around more during retirement. Like so many things, social interaction is a balance of sharing quality time with others as well as with oneself. DD observes that fewer social interactions often mean better quality interactions.

DD has changed much of her routine because of moving. Every article of clothing, every toiletry, every dish, every tool, every home office item and book have a new location. Some items remain in boxes until DD can add more shelving and storage cabinets. Soon DD hopes to refresh her knowledge of the French language. DD welcomes each day as an opportunity for new adventure and treasure hunting.

*Time Management*

The lack of structure in most days has sharpened DD's awareness of self-discipline. She does her best to avoid becoming addicted to cyberspace, e-mail and social media. She has mostly resisted the temptation of spending too much time and money shopping for new window coverings, shelves and furniture for her new condo. Some discretionary time is best spent on maintaining mental acuity by reading books, attending lectures and managing investments as well as doing physical and mental exercises – occasionally with friends and family.

DD is fortunate to receive many social invitations to join friends for meals and attend events. She has learned to balance social activities with the other points in her five-star life style, including physical health, mental health, financial health and intellectual/spiritual curiosity. Some of her activities entail walking or some form of physical health or attending a cultural event for intellectual enjoyment with a friend, thus combining social activity with other highlights of her five-star life style. One example would be attending a lunch+ speaker event with other professor emeriti who retired from the same university as DD. Maintaining a calendar with more and varied activities requires more planning time and attention than when DD was focused on her students and being a full-time professor.

*Career – Life Balance*

Having retired two years ago at the age of 71, DD still enjoys professional activities that include attending and presenting at conferences, Association of Computing (ACM) meetings, local lectures at Stanford University and the Computer History Museum, occasional consulting, research and writing engagements and some professional travel. DD also enjoys her volunteer work, recreational travel, social life, performing arts and cultural activities as well as an increased focus on healthy diet and exercise, and lifelong learning. By taking a disciplined approach to retirement, of which academia is a crucial part, with relative ease DD has created a happy and gratifying retirement that brings her closer than ever to achieving self-actualization.

*Financial Planning: A Female Perspective*

For decades DD has maintained a disciplined approach to her career and financial management. However, she deviated from this course during a twelve-year marriage when she supported her husband through a two-year MBA program and three-year law school program. Although she continued to work two jobs for most of her marriage and beyond,

by supporting her husband for many years, she fell behind on financial goals such as saving for her own retirement. She got a late start on building financial assets after the divorce but managed to “catch up” over time through disciplined financial management and wise investment decisions.

Looking back on life, there was a time where DD considered having children. When she assessed the feasibility, she realized there was no support system for a female professor to bear and raise children. Maternity leave was unheard of during DD’s child bearing years. A few day care centers existed but not night care centers. Since DD was routinely assigned night classes to teach that ended about 10 pm or sometimes 8 pm, there would be no one available to care for her children. Her husband of twelve years often worked late both as a student and later an attorney but did not want to sacrifice his career to raise children, pointing out the need for both wife and husband to work. Parents lived in a different geographic area and did not offer to relocate to help raise their grandchildren – after all, they had already taken their turn at raising kids. In sum, DD recognized the difficulty in doing both her career and parenthood justice, so chose not to have children. This choice means she has no adult children or grandchildren to enjoy during retirement.

Even now women earn less yet live longer than men on average (Hannon, 2017, p. F6). Certainly, DD earned less annually than most or all her male peers. There is longevity in DD’s family and she looks forward to living to age 100 or more. This brings into question whether DD’s financial resources are sufficient for a long retirement. Since becoming single again DD has done her best to manage money carefully and invest wisely. If she runs out of money, perhaps it will be time to apply for immigration to a less expensive country. Meanwhile she prefers to live on the west coast of the USA where she has lived since birth. In sum, female professors need to work longer and be more fiscally prudent than their male counterparts. Both male and female professors will benefit from developing a retirement plan many years before their anticipated retirement age thus enabling a smooth transition to a happy and fulfilling retirement. Spouses/partners need to be included in the development of financial plans.

### **What Role Does Teaching Play in A Retired Professor’s Life?**

Teaching was an integral part of DD’s five-year transition into retirement and for decades before that, starting with graduate school and at several universities after graduation. She considers teaching, as well as research, writing, and service, to be an integral part of her DNA. She anticipates teaching and academic activities will continue to be central to her life as a retired professor. With teaching comes the synergy of sharing one’s experience with young people as they share their passion for life. The adrenalin rush that comes with quality discourse in the classroom between instructor and student hones mental acuity and is mutually beneficial. Teaching and academia produce psychic income while profits from wise investments enhance one’s freedom of choice. Sufficient financial resources can subsidize a choice to teach for little or no pay.

Recently DD was approached about joining the adjunct faculty at a San Francisco Bay area university. When she inquired about the face-to-face component of teaching, the response was some sections may be online or hybrid format. Since DD prefers to teach face-to-face and such opportunities are becoming scarcer, she realizes most of her future teaching may be informal. This could mean teaching through making presentations before groups. As a volunteer at the Computer History Museum who gives tours and interacts with visitors DD teaches informally. At advisory board meetings, DD seizes teachable moments. Consulting can also be a form of teaching. One way or another DD will continue to teach but she recognizes there may more informal than traditional classroom opportunities.

Retired professors will benefit from remaining engaged in academic pursuits by teaching part time, conducting research and writing and/or performing academic service by serving on committees and advisory boards.

Maintaining collegial connections in addition to family and friend social connections remains important throughout retirement.

Hopefully the readers of this article and DD’s case will acquire some ideas on how to develop and maintain a five-star life style during retirement while not running out of money.

## CONCLUSIONS AND IMPLICATIONS FOR FUTURE RETIREES

In this paper, the author has shown that retirement constitutes a major stage of life and an important aspect of a person's career development. It occurs as an end period in the career life cycle. While some individuals may experience negative reactions as they enter retirement, fearing anxieties over their unknown financial, health, and personal futures, most retirees report that they are happier after phasing out of work compared to when they were actively engaged in work for a variety of reasons.

The author experienced satisfaction with retirement and her decision to retire. There is life after and beyond the university. Unless the separation experience radically changes, retirement will continue to beckon senior professors in the nation's colleges and universities. Creative benefits and financial arrangements that make retirement more satisfying will likely increase the attractiveness of embarking upon this new phase of life.

The author concludes with other findings suggesting that for each individual, retirement brings satisfactions and dissatisfactions. The greatest satisfaction for the author is having more time and flexibility without pressure to pursue the things that are most interesting and important. This is consistent with the findings of Miller and Form (1951), who indicate that retirees have a somewhat universal need to remain active in personal and group activities. The least satisfying aspect is the diminution of social and intellectual interaction. Phasing in retirement was seen to be preferable over immediate immersion into a life without work. This provided the time to plan financially and psychologically for the transition, to avoid what Erikson (1963) calls "despair." Maintaining self-discipline was highlighted as an important activity in retirement because it impacts on health, time management, career-life balance, and mental acuity. Retirees need to focus their activities appropriately to maintain physical and cognitive well-being. In addition, they need to manage their time because they have less daily structure and face increasing demands from spouses and friends to join them in leisure and relationship-maintaining activities. Self-discipline helps individuals in what Levinson (1978) calls the late adult era, where retirees give meaning to their working existence and begin to establish new structures for the future. Finally, this case study revealed the need for retired professors to be somewhat engaged in teaching – a major career passion into which each has significantly invested. While the art of teaching requires discipline, deadlines, and commitment, it also provides an immense measure of rewards, mostly intrinsic. Teachers who give heart to their students facilitate abundant blessings, known to students whose lives have been forever changed by the people who had the courage to teach – "the courage to teach from the most truthful places in the landscape of self and world, the courage to invite students to discover, explore, and inhabit those places in the living of their own lives" (Palmer, 1998, p. 183). Erikson (1963) calls this the battle for integrity – the sense that life and all its choices and experiences have come together. Thus, some retired professors, if not all, need to continue their engagement in teaching for personal fulfillment and to continue the ancient custom where the old empower the young and the young empower the old with new life, reweaving the fabric of the human community as it evolves (Palmer, p. 25).

According to Baldwin and Zeig (2013), a promising and innovative concept that could be of mutual benefit to academic institutions and retired faculty is the Emeritus College (EC). The primary purpose is to keep faculty emeriti both academically and intellectually engaged during retirement. ECs usually provide learning and enrichment activities, support for scholarship and research, institutional and community engagement and limited teaching opportunities. They are often affiliated with the Provost's Office and may be supported by modest university funds, membership dues and donations. ECs are separate and distinct from retired faculty associations which may emphasize social activities such as golf games. ECs have been implemented at the University of Southern California, Clemson University, Arizona State University, Emory University, among others. As more baby boomers approach retirement, the number of older senior faculty is expected to grow and potentially limit the ability of colleges to hire new junior faculty. A combination of phase-out programs and Emeritus Colleges could provide a bridge to meaningful retirement for senior faculty -- a place to call their professional home.

### Implications

There are several implications for the results presented in this paper. Some relate to organizational factors. Others relate to personal activities that might enhance a retired professor's mental connections and cognitive acuity.

## **Organizational**

Universities can influence the retirement decisions of their senior faculty in several ways. One is by assisting their senior faculty in retirement planning and by offering financial and other incentives to help sweeten the sometimes difficult decision to leave their life-long positions. They can also make retirement more attractive by assisting those professors who retire with intellectual activities to fill their time and satisfy their interests. They could, for example, provide office space and secretarial/administrative support to retirees. They could also continue to include retired professors in intellectual activities at the university. Lastly, they could provide programs for phased retirement, partial retirement, and formal retirement with part-time opportunities for teaching and research. At some colleges and universities these activities are or could be provided by the Emeritus College.

## **Personal**

An important implication related to the post-retirement activities highlighted in this paper is the desire to maintain keen mental focus. Halamisch (2016) advocates the idea that retirees should strive to increase their mental connections by engaging in new activities that stretch the brain and update or reprogram one's cognitive software. The question is: how can individuals update their mental software? Simply, individuals in retirement can perform routine activities in a different way or pursue activities that they have never performed in the past. By doing the same things, the mind is not challenged and new connections are not established. When university professors simply engage in what they have done in the past – teaching and research – no additional mental connections are established because the brain already has the capability to perform those tasks. Instead, Halamisch (2016) contends, professors in retirement should pursue new and challenging activities. A simple one might be to change the way one brushes his/her teeth, from using a dominant hand to using one's non-dominant hand. This may prove difficult at first because the brain is programmed to allow individuals to perform this task easily using one's dominant hand. To update that program, which would make brushing one's teeth with a non-dominant hand easy and natural, requires the establishment of new mental connections. Over time, this newly learned activity becomes programmed and keeps the mind more focused. Another activity might be to engage in activities never performed before such as learning to read music or paint a picture.

If retired professors wish to maintain the mental acuity and focus they had during their working careers – the attributes they possessed which gave them immense value as human capital – they need to increase their mental connections by engaging in activities they have not yet pursued in their lives. The pursuit of new activities will preserve the mind – the asset held by the person that made him/her a sustainable human resource (Barney, 1991; Wright, McMahan, & McWilliams, A., 1994). From a resource-based perspective, an intellectually sharp mind is a valuable asset because it is rare, inimitable, and non-substitutable.

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