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Digital Human Anatomy 2020 Interface 
Usability and Usefulness in a Medical School – A Pilot Study and Critical Analysis 
with Review of Contemporary Literature 
Sanjoy Sanyal, Richmond Gabriel University College of Medicine 
Gomattie Chunilall, St. Vincent and the Grenadines, Richmond Gabriel University College of Medicine 
Sharvari Shitole, Richmond Gabriel University College of Medicine 

INTRODUCTION
Cognizant of the constraints in imparting effective Human Anatomy learning to medical students, we introduced interactive 3-D Augmented-Reality based digital anatomy software as a supplement to cadaver dissections. Hitherto the latter had been the main mode of hands-on learning in our medical school.

MATERIAL AND METHOD
We used Visible Body® Human Anatomy Atlas 2020® on a Samsung Galaxy Tab S4 in Richmond Gabriel University, St. Vincent and the Grenadines from 2019 to 2020, before the pandemic-induced lockdown. We determined the usability and usefulness of the digital tool through a pilot study of 15 students, using the Computer System Usability Questionnaire (CSUQ) by Lewis JR (1995). We also critically analyzed the pros and cons of the digital model vis-à-vis cadaver dissection, with input from contemporary literature.

RESULT
The average usability score on CSUQ was 81% (Range = 88–126; Average ± SD = 107.1 ± 12.2; N = 15). Average score was more than +2 standard deviations (2 SD) of theoretical mean of 76. The digital model was interactive and showed spatial relationships of body parts in artificial color. It had Augmented Reality feature and easy learning curve. It had regional, systemic, sectional and functional anatomy modules, gross anatomy lab and microanatomy, but no radiology module. Screenshots of figures are in the Appendix. The systemic anatomy module was sufficiently elaborate to be used in classroom. It did not give instructions and lacked tactile feedback of human tissues. The touchscreen, laser stylus pen and artificial colors did not give the profound sense of handling human tissues.

IMPLICATIONS
There are many digital anatomy tools available to the medical academia, ranging in size and versatility from usage in classrooms and digital labs to those in individual laptops and tablets. Some have Virtual Reality-like, Immersive 3-D or Augmented Reality applications. They vary in accuracy, comprehensiveness, and versatility. Clinical students prefer digital tools with radiology content. They are good study tools, interactive and fun to teach and learn anatomy. They show body parts and spatial relationships. They are available offline, accessible anytime, anywhere and can even show rare pathology, like the one under consideration in our school. They present consolidated anatomy information to suit users' learning styles. They do not have the legal, ethical, religious, social, regional, and logistical constraints of human cadaver procurement. These factors are weaning away institutions from the hoary art of cadaver dissection.

CONCLUSION
Cadaver dissection is still the gold standard for learning human anatomy and surgery. It is the benchmark for measuring the success of newer learning technologies. Cadavers are students' first 'patients'. Digital resources are useful supplements to the armamentarium of learning methods in human anatomy. However, they lack haptic qualities of
human tissue, which are essential for a surgeon. Therefore, they can never completely replace cadaver dissection for anatomy students and surgical residents under training. Nobody would want to be treated by a surgeon who acquired their entire quantum of expertise in operating on the human body through Virtual Reality alone, just like nobody would want to be flown by a pilot whose only flying experience was in the digital flight simulator.

REFERENCES


APPENDIX

Figure 1: Composite screenshot of Visible Body® Human Anatomy Atlas 2020 used in this study

Figure 2: Modules available in Human Anatomy Atlas 2020

Figure 3: Sub-sections of Regions module of Human Anatomy Atlas 2020
Figure 4: Sub-seCTIONS of Systems module of Human Anatomy Atlas 2020
Figure 5: Sub-sections of Gross Anatomy Lab module of Human Anatomy Atlas 2020
Figure 6: Sub-sections of Cross Sections module of Human Anatomy Atlas 2020
Figure 7: Computer System Usability Questionnaire (CSUQ), based on Lewis JR (1995), used in pilot study to receive students' feedback on Visible Body® Human Anatomy Atlas 2020.

Figure 8: CSUQ Survey Result Histogram and Statistical Analysis

Respondents' Scores

Range = 88-126; Avg + SD = 107.1 + 12.2; N = 15; Avg (107) is > 2 SD (2 x 12) of theoretical mean (76)
Thinking “Differentiated” Development In The Era Of Coloniality Of Power: Is It Possible?

Jenna Adams, Brigham Young University, USA
Macleans A. Geo-JaJa, Brigham Young University, USA
Hamadullah Kakepoto, University of Sindh Jamshoro, Pakistan

ABSTRACT

This paper that is part literature review and part critique examine neoliberal false narration of power that leaves no space for dialogue and diversity reinterpreted human rights in another context. Neoliberalism cultural logic which ignores local realities and ethics mitigate emancipation, reciprocity, and alternative equitable approaches to “authentic” dialogue in development understanding. The false narration of “undifferentiation” must be disrupted and unmasked, rather than radically changing its content. The core lesson learned is not so much that development failed, but that it was never really on the agenda in the first place. Based on hegemonic neoliberalism reinterpreting human rights and relating vernacular societies as uncivilized visitors in global capitalism, therefore, posited as a solution to oppressive dialogue and development violence is decoloniality that strip civilizational violence and lack of humanness promoted in all parts of the world. Deepening “trust” and inclusion in every sphere of development will restore identity in development. Ultimately, the goal of recreation is to decolonialize neoliberalism a remain of the colonial outpost, which reproduce hegemonic relational dialogue in place of equality of opportunity and differentiated practices of development. Accordingly, exclusion in terms of nonrealization of human rights and ethics of agency, accentuate reproducing hegemony colonialism.
Cross-Generational Communication Preferences Within Online Higher Education: Has COVID-19 Made A Difference?
Linda D. Grooms, Regent University, USA

ABSTRACT
Whatever the discipline--leadership, psychology, nursing, or education to name a few--our role as professors in higher education is to ensure that we facilitate the most enriching and valuable learning experiences that give our students the tools they need to succeed. Surveying the ever-changing graduate population of one School of Education in the mid-Atlantic region of the U.S. over a period of 18 semesters, 500+ post-master's learners were asked their communication preferences and most recently, if those changed at all due to COVID-19. From Boomers to Millennials, their preferences may surprise you. Regardless of discipline, come hear how you can meet their needs. Offering programmatic implications, this researcher not only seeks to provide a glimpse into student preferences but also challenges the audience to examine their practices in relating to those within their organizations as we are now in the second decade of the 21st century and hopefully on the other side of COVID-19.
Strategies To Develop A Positive Mentoring Program In A K-12 Environment

Tera Simmons, Gadsden State Community College, USA
Linda Grooms, Regent University, USA

ABSTRACT

A positive mentoring relationship can positively alter an individual’s trajectory - the benefits lasting for a lifetime. Denzel Washington shared, “Show me a successful individual and I’ll show you someone who had real positive influences in his or her life. I don’t care what you do for a living - if you do it well I’m sure there was someone cheering you on or showing the way. A mentor.”

Knowing that mentoring can make a tremendous impact in someone’s life, K-12 environments must find the most effective way to mentor not only students but teachers. This provoked the researchers to ponder several questions such as What is the most effective way to mentor students and teachers in a K-12 setting? Do individuals prefer F2F meetings, phone calls, or social media to communicate with their mentors? Who do most individuals consider their mentor (i.e. a teacher, administrator, professor, parent)? Would these findings differ in generational groups such as Baby Boomers, Generation X, Millennials, or Y? These researchers sought to answer these questions by surveying over 3,000 students and teachers. The results of this study provide a plethora of information that is helpful in developing a mentoring program for not only teachers but also students. In this session, you will have the opportunity to engage in dialogue about the most effective way to mentor students and teachers in a K-12 environment. Come and learn how to make a difference that will last a lifetime.

AUTHOR BIOGRAPHIES

Dr. Tera DeLane Simmons serves as the Executive Vice President of Gadsden State Community College. She received her Doctorate of Education in K-12 Administrative Leadership from Regent University in Virginia Beach, Virginia, a Masters of Education in Collaborative Education and a Bachelor of Education in Mild Learning and Behavioral Disabilities K-12 from Auburn University in Montgomery, Alabama. She participated in the College Board Chinese Bridge Program, completed both the Superintendents’ Academy at the University of Alabama and the Council of Alabama Leaders Instructional Leadership Certification Program, served as a member of several AdvancEd Accreditation Teams, and was awarded the ASAHPERD Outstanding Administrator. She has presented at various conferences within and outside of the United States.

Dr. Linda Grooms serves as Professor in the School of Education at Regent University. With more than three decades of leadership and mentoring experience, she has spent the last 20+ years both researching mentoring excellence and employing what she has discovered into her mentoring relationships. She has presented this ongoing research at conferences across three continents for organizations such as the International Leadership Association, the European Communication Research and Education Association, the National Communication Association, and the International Mentoring Association.
COVID-19 In Mexico: Exploratory Data Analysis (2020-2022)

Gerardo Reyes Guzmán
Universidad LaSalle Bajío Campus Salamanca

ABSTRACT

By April 2022, Mexico appeared in place number five with 323,000 victims in the world ranking of the total Covid-19 deaths. We conducted an Exploratory Data Analysis to present Covid-19 deaths and cases using a scale of days per 10,000 deaths, filtering the top 13 and the top 6 federal states in terms of deaths within the Paretoian 80/20 rule, and running a correlation model of Covid-19 with socioeconomic variables. The main findings of this inquiry were, a) there is an inconsistency in the numbers of deaths attributed to Covid-19 vs. the total number of deaths in 2020; b) the Mexican demographic winter accelerates with a constant drop of the still positive difference between yearly births and deaths; c) July 2020 and January 2021 were the months with the highest number of deaths; d) 10,000 deaths were reported in a record of 8 days, on average, between January and February 2021; e) the top 13 states accounted for 72% and 73%, whereas the top 6 states for 47% and 51% of the Covid-19 deaths in 2020 and 2021 respectively; f) there were states with a significant increase in cases but not in deaths, and g) in the period under study Covid-19 deaths in 2020 were significantly correlated with: population, inhabitants per square kilometer, income per capita, average GDP growth rate per year (2003-2017) and cases and deaths in 2021.

Keywords: Covid-19, Exploratory Data Analysis, Mexico, cases, and deaths

Introduction

Christopher Murray published at the beginning of 2022 that the omicron variant of SARS-Cov-2 was striking with a huge wave of infections estimated to be around 125 million people a day worldwide, ten times the Delta variant in April 2021. Although large proportions of the population were thought to be infected by the omicron variant in the first quarter of 2022, the effects on health were expected to be modest because the Delta variant created some level of immunity among people. However, the global infection-detection of omicron declined from 20% to 5% because a vast proportion of cases were asymptomatic. According to Murray, more than 90% of infections in South Africa were asymptomatic. (Murray, 2022). The ratio of Covid-19 hospitalizations to detected cases hospitalized had declined by about 50% in most states in the USA. In response, Mexican authorities allowed the return to normal activities at the beginning of April 2022 but recommended observing the security protocols (Relaciones Exteriores, 2022).

By mid-April 2022, there were 502 million positive cases and 6.19 million deaths worldwide. Regarding the number of deaths, the USA appeared in the first place with 986,000; second, Brazil: 662,000; third, India: 552,000; fourth, Russia: 365,000 and fifth, Mexico with 324,000 (google, 2022). The pandemic drove the Mexican economy into a severe recession in 2020. In terms of economic growth e.g., the most affected Federal States were Quintana Roo (-24.3%), Baja California Sur (-23.5%), Tlaxcala (-12.1%) and Nayarit (-11.4%). The less affected were Tabasco (3.4%), Baja California Norte (-3.8%) and Chiapas (-3.8%). The national average was -7.9%.

Perhaps, this is the first pandemic by which a wide variety of statistics have been published. Most of the charts, analyses, and observations have focused on daily or weekly data. An Exploratory Data Analysis (EDA) is fundamental to describe a phenomenon. According to John Tukey (1962:6), data analysis must take the characteristics of science, namely: a) data analysis must seek scope and usefulness rather than security; b) data analysis must be willing to err moderately often in order that inadequate evidence shall more often suggest the correct answer and c) data analysis must use mathematical results as bases for judgment rather than a base for proof or stamps of validity.

Being aware of the limitations of the data published by the Mexican authorities, we resorted EDA to shed some light on the Covid-19 numbers. Our analysis aims at enhancing the discussion about the pandemic from the beginning
of February 2020 to the first quarter of 2022. We posed the following questions to guide this investigation: are there any inconsistencies between the number of deaths attributed to Covid-19 in 2020 on the one side, and the total number of deaths in Mexico documented that year on the other? can we represent the four pandemic waves using a different scale, for instance, days per 10,000 deaths? what do the number of cases and deaths look like if we use monthly and yearly data? what level of concentration was observed in terms of deaths within a Pareto 80/20 rule, say by filtering the top 13 and by using the Price Square Root Law among Mexican entities struck by the pandemic? and how do the pandemic deaths correlate with socioeconomic variables? We have divided this paper into three sections: methodology, results and discussion, and conclusions. In the first section, we explain the methodology and try to answer the questions mentioned above. We begin by explaining the inconsistency regarding the number of deaths in 2020. Second, we describe the four pandemic waves using a scale of days per 10,000 deaths. Third, we use graphs to describe the monthly trends of cases and deaths. Fourth, we resort the Pareto 80/20 rule by filtering the top 13 and the top 6 states struck by the pandemic. In section two, we correlate Covid-19 with other socioeconomic variables and formulate some hypothesis, and finally, in section three, we synthesize the main findings and point out the challenging research questions left by this analysis.

**Methodology**

a) Inconsistent numbers

In 2020 a total of 125,807 people died in Mexico from Covid-19, and 1,426,104 contracted the disease, a fatality rate of 8.8%. In 2021, 173,621 died and 2,553,619 contracted Covid-19 which made a ratio of 6.8%. Until March 2022, 323,016 Mexicans had died of Covid-19, and 5,659,535 had been infected, equaling a fatality rate of 5.7%.

![Fig.1](image_url)

Mexico: Total number of deaths

Source: Own calculations with data of INEGI

INEGI, an official source of statistics in Mexico (Instituto Nacional de Estadística Geografía e Informática (INEGI), 2022), publishes the total number of yearly deaths - of all causes- regularly. As shown in Fig 1, the yearly record of deaths increased from 419,074 people in 1994 to 747,784 in 2019, or at a yearly average rate of 2.16%. It is worth emphasizing that the difference between births and deaths has been positive but shows an important downward trend.
It went in the same period from 2,485,315 to 1,344,430, a drop of 46%. In 2020, there were 1,629,211 births and 1,086,743 deaths making a record low positive difference of 542,468. That constitutes a severe setback in Mexican demographics.

In 2020, 125,807 people died of Covid-19, and another 36,597 were victims of the violence striking the country since 2006, data from the ministry of health (IMSS). If Covid-19 had never occurred, the expected number of deaths in 2020 would have been 763,936. However, INEGI reported 1,086,743 or 322,807 more. Therefore, the death cause of 160,421 people was not defined but probably could be attributed to further causes related to the pandemic.

b) The four pandemic waves

Figure 2 displays the number of days per 10,000 deaths. The pandemic began officially on February 27th, 2020, and the first death was registered on March 18th, 2020. It took 75 days to gather the first 10,000 deaths. The first wave only took 15 days, on average, to complete an interval of 10,000 deaths; the second wave was the sharpest because 10,000 deaths were accumulated in only 8 days on average; 13 days in the third wave and 27 days in the fourth wave.

Furthermore, if we divide the total of deaths by milestones of 100,000, we have that on November 19th, 2020, the tally marked the first 100,000 deaths, which took 8 months and 1 day or 35 weeks. The second milestone, 200,000 deaths, took place on March 25th, 2021, and it only took 4 months and 6 days or 18 weeks. The third milestone, 300,000 deaths, occurred on January 12th, 2022, and took 9 months, 18 days, or 41 weeks. The main peaks in Fig 2 were marked by gathering 10,000 deaths in 8 days as the cumulative deaths reached 150,000 and 170,000 deaths, respectively. The lowest interval to gather 10,000 deaths took 58 days on average to make 300,000 deaths.
cases vs. deaths

Figure 3 shows the monthly number of deaths in 2020 and 2021. In 2020, the first peak was detected in July, with 18,919 deaths and 197,980 cases, a ratio of 10%. The second peak reached the ceiling in January 2021 when 32,729 people died, and 4,381,156 contracted the disease, making a rate of 7%. The third pandemic peak took place in August 2021, with 18,420 deaths and 4,969,986 cases, a rate of 4%. The number of cases soared to 962,867 in January 2022, but the number of deaths was modestly 6,663, making a ratio of barely 1%. This ratio, also known as the fatality rate, reached its record in June 2020 at 13%; it then went down to 6% in December 2020 and took off again to reach 13% in April 2021; from that month on, it kept constantly falling, indicating that the fatality of the pandemic was leveling off. Since the beginning of 2022, the fatality rate decreased, and it was believed that Covid-19 had become a sort of regular flu.
d) The top 13 and the Price Square Root Law

In 2020 and 2021, 72% and 73% of the deaths were concentrated in 13 Federal States, respectively, see Figures 4a (absolute numbers) and 4b (share). The states that integrated the top 13 in 2020 were the same in 2021, except for Coahuila and Michoacán. Michoacán, which was not in the top 13 in 2020 and replaced Coahuila in 2021. Coahuila reported a decrease in deaths from 4,181 to 3,626 (-13%), whereas, in Michoacán, deaths soared 100%, going from 2,757 to 5,517. These top 13 also gather 64% of the population; 53% of the national territory; 70% of the GDP; 59% of the homicides in 2020; 54% of the migrant remittances, and 74% of the Foreign Direct Investments.

The Price Square Root Law would affirm that half of the deaths should have taken place by the square root of the total entities (Nicolls, 1988). If we take the 32 entities as the total population and square root that number, we come up with 6 entities which should bear 50% of the deaths. Thus, out of 125,807 deaths in 2020, 6 entities accounted for 47%: Estado de Mexico (15%), Mexico City (13%), Veracruz (3%), Jalisco (5%), Puebla (5%) and California North (4%). In 2021, with 173,621 deaths, 6 entities were responsible for 51% of the deaths: Estado de Mexico (15%), Mexico City (14%), Jalisco (7%), Puebla (6%), Veracruz (5%) and Nuevo León (5%). In Baja California, deaths diminished slightly from 5,524 in 2020 to 5,503 in 2021, whereas Veracruz reported an increase of 38%, going from 6,339 to 8,760 deaths. The top 13 states appearing in Fig. 4a form two regions (Batalla, 1980) in which most of the economic activity takes place. The upper region is located along the border with the USA, and the middle region embraces five emblematic productions poles: Jalisco, Mexico, Mexico City, Veracruz, and Puebla.
reduction of the yearly difference between births and deaths should be addressed by the coming public policies, since demographic statistics for 2021 have not yet been published as this paper goes to print. Covid authorities presented the data regarding Covid. We found the following answers to the questions posed at the beginning. Firstly, there were inconsistencies in the way the data were collected and published, and this may affect the accuracy of the results. Secondly, the states with the highest increase in deaths from 2020 to 2021 were Estado de México (17,079), CDMX (6,820), and Jalisco (5,740). These three states have the largest number of inhabitants per square kilometer, 796 and 6,085 respectively. These agglomeration and centripetal forces traits suggest that such places constitute a potential risk for future pandemics. The Price Square Root Law proved also to be valid since 6 entities were responsible for 47% of the deaths in 2020 and 51% in 2021. Secondly, it seems intuitive to have found a correlation between Covid deaths and the population, the number of inhabitants per km², income per head, the average yearly economic growth (2003-2017) (BBVA Research, 2018), and increments in deaths from 2020 to 2021. The first four variables have to do with demographics and economics. The fact that the top 13 make up more than 70% of the Mexican Economic life suggests that Covid-19 was a global phenomenon and that regions with intense trade with the world were the most exposed.

This concentration can be explained by resorting to the fundamentals of localization theory, where agglomeration and centripetal forces play an important role in forming regions (Quintana-Romero, 2013; Gutiérrez Casas, 2006). The classical authors of such theory point out that most of the market interactions take place in the center of a region. This exerts an attraction force among the people due to advantages in production’s costs (Thunen, 2009; Christaler, 1980). Furthermore, the Price Square Root Law proved also to be valid since 6 entities were responsible for 47% of the deaths in 2020 and 51% in 2021. Secondly, it seems intuitive to have found a correlation between Covid-19 deaths between 2020 and 2021. In this context, the states with the highest increase in deaths from 2020 to 2021 in relative terms were Morelos (142%), Baja California Sur (113%), and Michoacán (100%). In absolute terms, the states with the most significant increment in deaths during the same span were Estado de México (17,079), CDMX (6,820), and Jalisco (5,740). Estado de México and CDMX have the largest number of inhabitants per square kilometer, 796 and 6,085 respectively. These agglomeration and centripetal forces traits suggest that such places constitute a potential risk for future pandemics. There were also federal states which reported a significant increase in positive cases but not in deaths and vice versa, a significant increase in deaths but not cases. For instance, in Quintana Roo the cases increased from 15,855 in 2020 to 46,221 in 2021 (191%), but deaths only increased from 2,028 to 2,073 (2%). The same was observed in Tabasco, where cases soared from 44,248 to 100,752 (128%), but deaths fell by -20% from 3200 to 2559. Conversely, in Michoacán, cases increased from 33,104 to 40,849 (23%), whereas the number of deaths soared from 2,757 to 5,517 (100%).

**Conclusions**

We found the following answers to the questions posed at the beginning. Firstly, there were inconsistencies in the way authorities presented the data regarding Covid-19. More people died of all causes than the number officially attributed to Covid-19 and homicides. We believe that the excess of deaths has to do with illnesses related to the pandemic. The demographic statistics for 2021 have not yet been published as this paper goes to print. In this context, the constant reduction of the yearly difference between births and deaths should be addressed by the coming public policies, since...
it represents the beginning of a demographic winter, the way West Europe is already experimenting it (Larrumbe, 2018). Secondly, we could observe the intensity of the pandemic, and the waves by using a scale of days per 10,000 deaths. By means of that scale, we could spot two episodes of 8 days in which such number of deaths was recorded. Thirdly, by tracing the monthly cases and deaths over the two years, we realized that most of the fatalities happened in 2021, whereas the fatality rate reached a ceiling of 13% in June 2020 and April 2021, respectively. The fatality rate kept falling and touched the bottom at the beginning of 2022, sealing the end of the pandemic. Fourthly, Covid-19 showed significant correlations with population, the number of inhabitants per square kilometer, income per capita, and average economic growth per annum (2003-2017). These characteristics match the fundamentals of the Localization Theory, which could enrich further investigations about the role of agglomeration and centripetal forces in pandemic cases. This hypothesis was reinforced by the fact that 13 Federal States accounted for more than 70% of the deaths. In this context, the Price Square Root Law proved also to be true as we found that 47% of the deaths in 2020 and 51% of the deaths in 2021 occurred in 6 states. We must also emphasize that the two entities with the worst economic performance in 2020 were neither in the top 13 nor in the top 6 but constitute the backbone of Mexican tourism; they were Baja California Sur (23.5) and Quintana Roo (24.1). In other words, the economic sector most affected by the pandemic was Services, which mainly embrace restaurants and hotels. Finally, two questions can be posed to continue this research, why did the authorities report fewer deaths of Covid-19 than the total mortality in 2020, and why did deaths fall in 2021 in states like Coahuila and California but increase strongly in others like Michoacán and Morelos?

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The Guidance Of Bank Lending Toward Priority Sectors In Malaysia Since The 1970s
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ABSTRACT
This research engages in two tasks: it reviews how the Central Bank of Malaysia has encouraged the banking sector to increase loans to priority sectors; then, based on this review, it seeks to generate policy inferences that may be beneficial to the Malaysian government.

Soon after Malaysia was independent from the U.K., the Central Bank of Malaysia, aka Bank Negara Malaysia (BNM), was established under the Central Bank of Malaysia Act 1958 (Act 519) and started operations in January, 1959. The outstanding feature of Act 519 was that BNM was allowed to intervene in the lending market of the banking sector and control bank credit to the economy. In 1974, the Bumiputera community (Malay and indigenous people), small companies, and individual housing loan activities were designated as priority sectors, and BNM intended to allocate more loans to them.

BNM emphasized that their intervention in and subsequent restructuring of the bank lending market was based on two factors. First, the priority sectors were facing difficulties in obtaining enough loans from banks during the 1960’s and 1970’s. Statistics showed the loan share of each sector accounted for 6% in the Bumiputera community, 17% in small enterprises, and 6% in the individual housing loan sector until the early 1970’s. Second, the government of Malaysia was keen to improve Bumiputera’s economic position because they, as an ethnic majority of the country, were far behind other ethnicities in terms of income level. The government of Malaysia had ambitious plans for an improvement of Bumiputera’s economic situation. The government has provided a wide variety of preferential treatments for Bumiputera and a baseline for the number of loans that must be allocated to this group was one of them.

This research found that BNM determined lending quotas for each priority sector every year and issued the quota in the form of a lending guideline. The quota has been decided in accordance with the economic situation; however, it has been constantly increasing every year. The banking sector has had to fulfill the guideline and a penalty was imposed if financial institutions failed to achieve the target.

The author’s research also revealed that there was a remarkable development of the guideline in 2005. BNM allowed each bank to decide lending targets for the priority sectors, as long as a half of them were allocated to Bumiputera. This is very natural that market intervention by the Central Bank has been gradually reduced as the country advances its economic development. Currently, Malaysia is categorized as an upper middle-income country in accordance with the World Bank’s criteria.

From this research, the country should shift towards more market-based credit allocation as economics teaches us that a market mechanism is the best way to allocate resources efficiently. This is sometimes inconsistent with political beliefs. In reality, Bumiputera is the largest ethnic group in Malaysia and has very strong influence on the outcome of general elections. Nevertheless, the government and BNM need to lessen market intervention in the bank lending market in order to become a more fully developed country.
Dwindling Resources On Superintendents' Leadership And School Board Decision-Making And Students’ Well-Being And Academic Outcomes Remain A Challenge

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ABSTRACT

Superintendents have many challenges in performing the job in most school districts. A high percentage of superintendents see the most challenging tasks are to improve the performance of diverse underprepared students, how to help students who come to school from high poverty areas who need so much help and recruiting and maintaining quality teachers to work in schools. Other challenges for superintendents are strengthening academic rigor, budget shortfalls, recruiting and retaining principals/teachers, and rising demands for assessment from the state and federal levels. Superintendents are concerned about students being safe in schools, being successful in careers and education in post-secondary settings in a rapidly changing economy and a highly technologically driven society (Noonoo, 2018).

Keywords: Superintendent, Board Members, Funding Sources, Student Well-being

INTRODUCTION

Today, more school districts are impacted by limited funding resources across the United States. Therefore, school district superintendents and school boards must seek greater support from stakeholders and partners in education to help with the needs of schools resourcefully (Glass & Franceschini, 2007). The well-being of students has been and must continue to be a priority for school leaders and policymakers. Therefore, superintendents and board members must work collaboratively to ensure the safety of students and others in the school environment. This means answering questions based on their value system and what they believe regarding the growth of students. Especially with thoughts, what is the belief of the superintendent and board during a crisis? Another question is, how effective do boards and superintendents’ dysfunction during a crisis such as COVID-19 and shooting in schools? What is the policy issue and is there a plan with needed resources in place for a crisis situation and how would effective communication be deployed with all levels with consistency by school leaders including safety officers (Urist, 2014)?

Problem Statement

According to Daarel Burnette, II (2020), nearly half the school districts in the United States may be forced to make the deepest cuts ever in the fiscal budget, because of COVID-19. These funding cuts will affect hundred and thousands of staff members such as teachers, administrators, and other staff. Many minority schools will be affected by these budget cuts. Because of COVID-19, the entire United States is suffering from an economic standstill. The results of this recession have shown a light on the issue of division between rich and poor school districts. Most school districts in recent surveys believe that there will be a drop in fiscal resources in the coming year according to school district administrators (Burnette, II, 2020).

There continues to be inequitable funding and the retention of highly qualified teachers for schools, especially in low-income schools. Therefore, the superintendent and the school board must work together strategically to secure
adequate funding and make use of all resources in an equitable manner to affect student achievement in schools within the district (Hill, 2006). Inadequate funding is the biggest problem facing the United State education system according to the latest. Inadequate funding may suggest that when there are fewer teachers in schools, frequently turnover of school leaders, and the oversized classroom with large numbers of students per teacher. The inadequate funding and resources could suggest lower student achievement and outcomes for schools (Gallup Phi Delta Kappa poll PDK, 2012).

**Perspective and Framework**

Most public schools according to (Knoeppel, Matthew, & Sala, (2013), receive most of their funding from the property owner. However, a new framework for school finance reform is communicated to provide equitable funding for the school district. The goal for funding evolves with the demand of a changing world in educational resources needed for schools. Therefore, schools must keep up with these ongoing changes needed for students beginning their education in school to be successful in graduating from our public schools in preparation for careers, college, civic engagement, and the workforce economy. The strength of the economy is tied to a well-educated workforce Overall, a good education is the best predictor of future income for an individual or family Schools need the resources to be able to provide students with a quality education. Currently, too many school districts are underfunded and have not been successful in finding ways to put together a quality approach to school funding and students' education suffers especially the most vulnerable students (Chen, 2018).

Superintendents and board members must have jointly more professional development activities to be highly skilled in budgetary matters and spending for the school system. Optimizing all spending is crucial when funds a dwindling for the school district. Seek to hire highly qualified teachers with multiple certifications, offer professional development for all new personnel, can ensure that students are supported with wraparound services, evaluate the curriculum, and make it relevant to what is expected in the marketplace now and in the future projections. It is important to assure the safety and cleanliness of school facilities to fight viruses such as COVID-19 and provide extracurricular offerings, technology infrastructure, food, and field trips for students virtually (Burnette, II, 2020).

Superintendents and board members should collaboratively work with internal and external stakeholders to ask these questions: 1) Is the school district allocating resources equitably across schools, based on the needs of students? 2) Is the chart of accounts giving a true picture of what schools need; do leadership programs include financial management, and if not, what should be done to make improvements in the area? 3) Do school leaders have easy access to their financial transactions and account status? 4) Is the budget aligned to address ongoing academic problems in schools? What percentage of your budget was spent on strategies to address the goals and priorities of the district? 5) How much unspent grant money did the district return last year? 6). How much money was spent on software, curriculum, professional development, or other materials that were well researched or proven positive outcomes? 7) How do superintendents and board members show the equitable distribution of resources? 8) How can the equitable distribution of resources be assessed with transparency, and how much are district programs considering a worthwhile investment? If students are to receive equitable resources in schools for their total well-being which includes quality of life, relationships with family, teachers, and the community it is necessary for the superintendent and board members to work together for the well-being of students (Else, 1993).

**Literature Review**

Historically, the superintendent and board members have had to look at policies jointly, but the superintendent had the responsibility to execute policies set by the board. There are several decision-making processes. Some decisions made by the superintendent and board include how to increase student achievement, decrease the dropout rate of students, create the vision for the school system, build a consensus for improving schools, promote site-based management, open and operate their own Charter school, view their relationship and success based on the achievement of students. Other tasks for the superintendent are personnel moving being shared, evaluating, and assessing personnel and programs, replacement of principals, involving the community in decision-making on certain issues, working with media on ethical matters, keeping regulations to a minimum, participating in national conferences, and confronting controversial issues about school matters (Kowalski, 2003).
It is so important that the superintendent and board members work together today to ensure that their school district can continue to offer the needed resources for students and teachers in their schools. Because of COVID-19, many school districts are making deep cuts to educational spending by slashing programs and laying off hundreds and thousands of workers including administrators, teachers, and other staff to get control of the limited financial resources available within the school district (Burnette II, 2020). By building and maintaining relations with potential funders and foundations for the school district, there could be many more opportunities for school districts to have additional supporters to contribute to school resources. The future of funding for k-12 could be more resourceful and equitable for schools from funders as shared in this study (Martin & Shuls, 2018). Some potential grant funders could be Bill & Melinda Gates Foundation, Carnegie Corporation New York, The Joyce Foundation, NoVo Foundation, Chan Zuckerberg Initiative, The Charles Stewart Mott Foundation, Jack Kent Cooke, Oak Foundation, Spencer Foundation, The Wallace Foundation, and The Walton Family Foundation. When funds are available, it is essential that the superintendent, board, and school building leaders ensure at all levels that funds are spent wisely, optimally, and in compliance with the needs of students. Schools must be more accountable based on how funds are spent because across the United States funding resources for schools are dwindling and the superintendents and board members must jointly as key leaders for the school district to find a vital solution to the problem (Education Week, 2020). Superintendents, board members, and building leaders should explore the many possibilities regarding funding for schools to ensure greater student success (Follett, 2020).

Methodology

The researchers used a qualitative approach to this study to address how the school superintendent and board members can work together to secure adequate funding to ensure students will have the needed resources in schools. The reality of dwindling funding for school districts is present today in most school districts across the United States. This was a qualitative study that examined sources used to fund public schools and what additional funding resources to seek within states and various funders regarding donations and grants such as large foundations. Second, the importance of school superintendents and board members working collaboratively together in securing funding for schools is a must today in order to survive. Also, the importance of the wise use of funding resources when obtained during tight times must be a topic priority for all school leaders. Data collected for this study were qualitative where the researchers looked at some descriptive readable documents, articles, reports, informal conversations with school leaders and resources being available to possibly find ways to offset the dwindling of school funding. The researchers in this study looked for the most reliable sources concerning ways for superintendents and board members to work together through strategic planning in their decision-making to secure additional resources to ensure the well-being of all students as the top priority in the school district.

Findings, Results, and Conclusion

Based on data reports and document collections, the results of this study did show the importance of how the superintendent, board members, and stakeholders will need to continue to work collaboratively in making decisions for the best interest of students’ well-being and by being creative, innovative and being able to develop and maintain efficient and effective management systems for the school budget in an equitable manner for all schools. This study made a pitch at the reality that school district leaders must optimize school time and the use of additional funding resources from grants and donations being utilized more effectively. The end results for all financial matters are simply communicated in a basic language, that is, being smarter in securing and managing financial resources more proficiently. When there are funding disparities in schools or school districts can alter the opportunities for students to meet their educational potential and their well-being. These disparities in schools continue because a number of states continue to cut school funding (Leachman, Albares, Masterson & Wallace, 2016).

Second, school district leaders must learn quickly to be managers it is a must to be smarter regarding the use and distribution of the school budget and learn how to proficiently operate schools with limited resources. There may be a need to decrease the number of purchased textbooks, using paraprofessionals, and field trips, but use more virtual resources online. It may be necessary to extend the day and use one bus trip to and from school, have fewer substitute teachers, and increase the number of students in a classroom. School leaders, superintendents, and board members need to also look at model school districts that are effectively operating with far less funding and how these school districts do with less and continue to offer quality education to students. School leaders need to do a better job
managing the budget and maybe this study can shine a brighter light on thinking and spending resources for schools in a more strategic manner. School district leaders need to have a mindset of how to lead and spend smarter and be able to maintain the well-being of students within the school district. It is the belief by former key school leaders that most superintendents and board members could benefit from a number of practical courses in school finance and management (Levenson, 2012).

**Significance**

**Significance of this Study**

This study is significant because the research showed how the superintendent and members of the school board must be strategic in the use of funds for schools in a time of scarcity to ensure accountability of students’ wellbeing and greater student success academically. It is important for all superintendents, building leaders, board members, and parents in the school districts to collaborate in decision-making to secure additional resources and decide how the resources will be used in the most efficient manner. This is important because there appears to be continuous limited funding available moving forward in the future to operate schools, because of a weak economy, fewer property taxes, fewer sales taxes, and federal revenue. Therefore, school leaders must be smarter regarding financial school matters (Levenson, 2012). Relying on state revenue for public schools from the state level may be wishful thinking and not a reality for a few years to come. School district leadership and the board must seriously start thinking now about how to secure school funding from different sources such as grants and donations and not depend solely on the state for all school funding because states across the United States are showing little money from the states' revenue pot at this time (Burnette, II, 2020).

**Conclusion**

Most school districts across the United States are seeing a decrease in funding for schools. Therefore, school leaders at the building level, superintendents, and the boards must realize that school funding is limited in most school districts. School leaders today cannot reply to past strategies to get through the funding of the school district. It must be a priority that school leaders optimize their limited funding, be creative, and be innovative by reviewing models in thriving school districts around the United States that are operating with fewer resources in an effective manner and are meeting the needs for the well-being of students.

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Teaching The Astronomical Visualization Used For The Explanation Of The Ancient Ein-Gedi Archaeological Zodiac And Its Related Inscription

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ABSTRACT

In teaching the history of astronomy, mosaics found at ancient synagogues in the Middle East are invaluable. The ancient Zodiac signs forming such mosaics are related to the seasons indicating the fact that the precession of the Earth axis had been neglected or even unknown. We demonstrate that the sage’s derivations of the patriarch’s ages in the chronology of the Septuagint version of the bible correspond to the signs of the zodiac, an assumption supported, for example, by the inscription found in the ruins of the Jewish synagogue in Ein-Gedi. Through our astronomical calculations we solve the sun-moon conjunctions occurring at the beginning of the zodiac signs – at the Vernal Equinox - considering the real sun’s orbit.

Since the Septuagint version of the bible is assumed to have been translated into Greek in the 3rd century BC from an earlier existing Hebrew source, the fact that the ages of the patriarchs correspond to the observations of the real sun’s motion, leads to the conclusion that the Septuagint version is an important book of the history of science. As a result of our findings, the bible can, thus, be regarded as one of the most ancient detailed scientific teaching sources leading to improved astronomical models which determined the planetary orbits.

Keywords: biblical Chronology • Masoretic Text • biblical patriarchs • Old Testament • Ein-Gedi Inscriptions • Septuagint Text. • Ancient Astronomy • Ancient Astrology

1. INTRODUCTION

The biblical ages of the first ten patriarchs as given in the Septuagint and the Masoretic versions of the bible, are summarized in Figure 1.
Figure 1. The chronology from Adam to Noah, according to the Septuagint and the Masoretic versions of the Old Testament. The Septuagint data and the names’ method of spelling in the Figure are based on the New English Translation of the Septuagint (NETS, 2009).

A. = Age when the forefathers were born in the lineage.
B. = Anno Mundi. C. = Length of life after A. D = Total length of life.

* In the Alexandrinus version from the 4th century AD, Metousala’s age in A is 187. In the earlier version, the figure was 167 in spite of the contradiction between the year of the deluge (2242) and the year of the death of Metousala (2256).
** In some sources – 502.

(We note that in the text we use the Masoretic names as follows: Adam, Set, Keenan, Mahalallel, Jared, Hanoch, Metuselah, Lemech, and Noah.)

Students studying Genesis, chapter 5, which provides the data summarized in Figure 1, are amazed by the high number of years in age assigned to the patriarchs in the two milestones of their long lives. When discussing the ages of the patriarchs at the time the forefathers were born (column A in Figure 1), most researchers only address the Masoretic version (see, for example, Bernini 1970 and the list of references in Kvasnica 2005). In this work, however, we concentrate on the Septuagint version aiming to prove that the ages result from detailed astronomical-astrological calculations.

Our approach is based on the following:

We find in the Talmud that a person’s characters are ruled by the various planets in each day of the week in which he was born, in accordance with common contemporary beliefs (See, for example Talmud1 in References).

Such a strong relation is expressed in all major languages by naming the weekdays after the planets (as, for example, Saturday [after Saturn], Sunday and Monday in English).

The above interrelation between the names of the weekdays and the planets originates from the Planetary Hour’s system as described, for example, in Rashi’s (Rabbi Solomon Yitsack) explanations to the Talmud2 – see References.

Consequently, it is clear that the ancient cultures believed in the power of planets as rulers of the hours and the weekdays. And the question arises whether in the ancient cultures there were also rulers assigned to the mean months of the year in connection with the stars in the sky.

Unexpectedly, an inscription found in the ruins of a synagogue in Ein Gedy, near the Dead Sea (Figure 2, see Discussion) is claimed by us to have provided the answer:
The inscription clearly relates the 12 lunar months in the Hebrew calendar to the 12 Zodiac signs and the antediluvian Patriarchs.

As a result we have added the assumption that the sages who wrote chapter 5 of Genesis were trying to make each patriarch the ruler of a zodiac sign in the sky (with Noah the ruler of 3 signs). Our next step was to calculate how many years would be required to correspond a new-moon as close as possible to the beginning of any zodiac sign in the sky?

In solving that enigma, we were astounded to realize that the straight forward astronomical calculations led us to the ages of the patriarchs. Figure 3 summarizes the result of the calculations which are detailed in the following Sections:
In Cohen 2018, we showed that in the years of creation, the birth of Abraham, Exodus, and the building of Temples I and II, the sun, the moon and the beginning of the zodiac sign of Aries ( = the beginning of Spring) form a straight line as seen from Earth (Figure 4)

Figure 4. The mean sun and the mean moon have both the same 0° celestial longitude at the Vernal Equinox (the beginning of the zodiac sign of Aries – the beginning of spring).

We showed that such astronomical visualizations of the sky are very rare events, taking place in cycles of 483, 502, or 1468 years, when the lengths of the year and the mean month are taken to be \( Y_1 = 365.25 \) and \( M_2 = 29.530594 \) days, correspondingly. Following the above concept, in the next Sections, we will demonstrate that the sages determined the cited ages of the biblical patriarchs in the Septuagint version by using our suggested ancient-world approach.
Such a connection is shown below to be derived from the eccentric motion of the sun as visualized in the second half of the first millennium BC. We first discuss below the motion of the mean-sun (MS) and the mean-moon (MM) both determined as moving on perfect circles surrounding the Earth at the center. We will then use the conjunctions of the Sun and the Moon (the new-moons) in these two ideal motions to derive the average age of the patriarchs as related to different signs of the zodiac, separated by exactly 30° from each other (Section 2). In Section 3, given the visualization of the astronomers of the 2nd half of the first millennium BC, the real orbit of the Real Sun (RS) is discussed leading to the practically undeniable way that, as claimed by us, was used to determine the ages of the patriarchs from Adam to Noah when they begot their following generations.

The implications of our findings to the history of science and to the originality of the different versions of the biblical chronology are summarized in the Discussion (section 4).

2. The Motions of the Mean Sun

We first determine what would have been the average age of the biblical patriarchs cited in column A in Figure 1, had they been calculated to correspond to the MS and MM conjunctions (= Mean Synodic Month = NM) occurring at the beginning of the different signs of the zodiac, based on the 4th-3rd centuries BC astronomical input.

In this work we assume that when calculating the chronology of the Septuagint version, the celestial longitude of 0° was used to correspond to the beginning of the mean sign of Aries, the first sign of the zodiac.

We consider that in the biblical year of creation, the sun and the moon were believed to have been created on a Wednesday along with the 12 signs of the zodiac (Genesis 1). Since the measurement of time (as, for example, the start of the first "Tekufat Nisan", which is the start of the mean spring season) corresponded to the MS, we assume that the MS and the MM had been at the celestial longitude of 0°.

Since the MS is moving at a constant rate around the mean zodiac signs it moves from one sign to the next by advancing in constant steps of 30 degrees

Let us suppose that the first NM took place at exactly the celestial longitude of 0° with the sign of Aries. We now want to find the number of months and years required for the MS to produce a NM with the MM at the start of the new sign (the sign of Taurus) at exactly the celestial longitude 30°.

In order to perform such calculations we first assume the picture of the world in which the MS is moving, as mentioned above, on a circle with the Earth at its center as described, for example, in the planetary system developed by Aristotle 384 BC – 322 BC.

By assuming that the lengths of the solar (tropical) year and the mean lunar (synodic) month used in the Septuagint biblical chronology were \( Y_1 = 365.25 \) days, and \( M_1 = M_1 = 29.5 \) days + 44 minutes \([ = 29.530556 \)](correspondingly (Ptolemy’s Almagest [Toomer, 1998]and the present Hebrew month use \( M_2 = M_1 + 3\frac{1}{3} \) seconds), the celestial longitudes of the NMs are calculated in degrees to occur in steps of 29.105092° from each other:

\[
29.530556 \times 360/365.25 = 29.106092°.
\]

Our goal is, therefore, restricted to determine how many steps of 29.105092° are required for a NM to occur at the celestial longitude of 30° (within one hundredth of a degree).

It can be shown (Cohen 2018, and 2020) that 426 years, are exactly equal to 5269 NMs: The difference is practically negligible and amounts to 4 minutes:

\[
5269 \times (29.53055556) = 155596.5 \text{ days} - 4 \text{ m} = 426 \text{ years} - 4 \text{ m}.
\]

Therefore, after a cycle of 426 years the NM will return to occur at the 0° celestial longitude.
Figure 5 plots all the NMs within the cycle of 426 years that obtain a value between 20° and 40° (1/18 of the entire 5269 cycle of months covering 360°), and only one year (179.0833) corresponds to exactly 30°.

It can be seen (Figure 5) that the NM closest to the celestial longitude of 30 degrees occurs after 2215 months = 179\(\frac{1}{12}\) Julian years:

\[
2215 \times 29.106092° = 64469.993°
\]

Modulo 360 = 29.993°.

In 2215 NMs, the MS would, thus, complete 179 + 1/12 cycles of 360 degrees. As to the exact number of years:

\[
2215 \times (29.5 \text{ days} + \frac{44}{60/24}) = 2215 \times 29.530555 = 65,410.18055555 \text{ days.}
\]

\[
65,410.18055555 / 365.25 = (179 + \frac{1}{12}) \text{ years} [-10 \text{ minutes}].
\]

Consequently, if we have, for example, a mean NM at the beginning of the mean sign of Aries, then after (179 +1/12) years, the celestial longitude of a NM will be at the beginning of the sign of Taurus.

Therefore, in order to move the NM around all 12 zodiac signs using similar steps, we would need

\[
12 \times (179+1/12) = 2149 \text{ years.}
\]

Astonishingly, this total number of years corresponds well with the sum of the first 10 generations of the patriarchs’ ages (with the assumption that Noah represents 3 generations) in the Septuagint:

\[
230 + 205 + 190 + 170 + 165 + 162 + 165 + 167 + 188 + 500 = 2142.
\]

We note that the sum is expected to be just roughly the same since the mean motions are replacing the real motions. We also note that the value of 2149 above, resulting from our calculations, does bring the final conjunction close to the celestial longitude of the original conjunction, since 2149 years = 5 cycles of 426 + 1 cycle of 19 years (5 cycles of 426 years brings a NM 20 minutes before the Vernal Equinox and with 100 minutes deviation in a 19 year’s cycle it amounts to a relatively small deviation of 120 minutes).
3. THE MOTION OF THE REAL SUN

Johannes Kepler was a central figure in the scientific revolution of the 17th century and proved that the earth moves in a parabolic orbit with the sun being at one of the points of the parabola. The fact that the sun is at different distances from the earth during the year was, undoubtedly, known in the ancient world but all the motions of the planets including the sun were described as rotational motions on circles or spheres, with the earth at their center. Only in the 4th century BC a complex system of concentric spheres described by the Greek astronomer Callippus gave way to epicycles and eccentrics, and his model became the standard for correlating observations accurately over many centuries, and thus contributed to the accuracy of later astronomical theories (see, for example, Neugebauer 1969).

Apollonius of Perga 262-190 BC, had come out with a simpler, more accurate, epicyclical, or its equivalent eccentric, systems (Figure 6) which were both used to even better explain Callippus' observations. A century later (in 175 BC) Hipparchus measured the aphelion of the sun's orbit (when the sun is furthest away from earth) to be at what he believed to be a constant celestial longitude of 65.50 (with the spring point of Aries at 0°).

But, even though only one millennium later al-Battani corrected Hipparchus' celestial longitude of the aphelion and showed that its value is constantly varying, accurate observations could have led astronomers before Hipparchus to longitudes shorter than 65.5. Since the celestial longitude of the aphelion advances gradually about 1 degree in 58 years, it follows that in the years 330 - 300 BC, the aphelion was at about L_{ap} = 63 degrees. This was between half a century to a century prior to the Greek translation of the Septuagint version by 70 Jewish sages. We shall refer to this value of the aphelion in the Discussion. However, regardless of the contemporary observed position of the aphelion, we assume in our derivations that all ancient astronomers accepted the anomalistic year (= the time between consecutive aphelions) as identical in length with the tropical year as emphasized by Neugebauer, 1969. The celestial longitude of the aphelion remained constant in the calculations performed by the ancient astronomers including, specifically, those involved, as we claim, in the determination of the chronology of the Septuagint version of the bible.

To demonstrate our calculations, we shall use a simplified version of Apollonius' model as developed by Ptolemy based on Hipparchus' eccentric or epicycle systems for the tropical and the anomalistic year: As illustrated in Figure 6a, the MS moves in a clockwise motion on the large circle with a constant angular speed (ω = 360°/year), whereas the small circle, the center of which is on the large circle, represents the motion of the RS moving anticlockwise on the small circle with exactly 1/2 of the angular speed. With a radius R of the MS's orbit (AE in Figure 6a), the radius r of the RS's circle (AS in Figure 6a) was assumed by Ptolemy to be r = R/24 (E*E/D*E in Figure 6b).

The celestial longitudes of the 12 signs of the zodiac are assumed to have an equal extension of 30° each and are all positioned on an outer circle the center of which is the earth. The RS would be seen from earth at the beginning of each sign moving in unequal time steps from one sign to the next. The unequal steps of the real sun are easily visualized in the eccentric model (Figure 6b) by comparing the arc AB near the perihelion point of the motion (the closest distance), against the arc CD near the aphelion. The unequal time steps are better visualized in Figure 6a where in the aphelion's celestial longitude B (at 65.50°) the motions of the RS and the MS are exactly in opposite directions. This causes the RS to be slower relative to the zodiac signs. However, as they approach the perihelion (point C in Figure 6a) the two directions are similar and the RS moves faster relative to the zodiac signs.
Figure 6. The epicycle (Figure 6a) and the eccentric 64b) models of the motion of the RS both lead to exactly the same varying speeds of the RS (see, for example, Ptolemy, mid-2nd century AD). Point \(A\) in Figure 6a represents the position of the MS on the day of creation, at the celestial longitude of \(0^\circ\), whereas point \(C\) represents its position at the beginning of the real autumn. Points \(B\) in Figure 6a and \(D\) in Figure 6b, are the aphelions the celestial longitudes of which are \(65.5^\circ\).

Using either one of the two models with the aphelion (where the celestial longitudes of the RS and the MS are identical – point \(B\) in Figure 6a, or point \(D\) in Figure 6b -) is assumed to be at the celestial longitude of \(65.5^\circ\), the celestial longitudes of the RS corresponding to the celestial longitudes of the MS at the beginning of each sign can be calculated. The results are presented in Table 1.

<table>
<thead>
<tr>
<th>The List Number of the Zodiac Signs</th>
<th>Zodiac Sign</th>
<th>Celestial Longitude of the Mean Sun (L_M)</th>
<th>Corresponding Celestial Longitude of the Real Sun (L_R)</th>
<th>MS-RS (D)</th>
<th>Real Sun Steps Between Consecutive Zodiac Signs (C_R)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Aries</td>
<td>0</td>
<td>2.1344</td>
<td>-2.1344</td>
<td>29.2062</td>
</tr>
<tr>
<td>2</td>
<td>Taurus</td>
<td>30</td>
<td>31.3406</td>
<td>-1.3406</td>
<td>28.8788</td>
</tr>
<tr>
<td>3</td>
<td>Gemini</td>
<td>60</td>
<td>60.2194</td>
<td>-0.2194</td>
<td>28.8267</td>
</tr>
<tr>
<td>4</td>
<td>Cancer</td>
<td>90</td>
<td>89.0461</td>
<td>0.9539</td>
<td>29.057</td>
</tr>
<tr>
<td>5</td>
<td>Leo</td>
<td>120</td>
<td>118.1031</td>
<td>1.8969</td>
<td>29.5313</td>
</tr>
<tr>
<td>6</td>
<td>Virgin</td>
<td>150</td>
<td>147.6344</td>
<td>2.36556</td>
<td>30.1559</td>
</tr>
</tbody>
</table>
Table 1: The celestial longitudes of the RS when the MS's longitudes correspond to the start of a mean sign of the zodiac: \( C_R(I) = L_R(I+1) - L_R(I) \). [Note that when \( I+1 = 13 \), \( C_R(12) = L_R(1) + 360 - L_R(12) \).] \( D(I) = L_M(I) - L_R(I) \).

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Libra</td>
<td>180</td>
<td>177.7903</td>
</tr>
<tr>
<td>8</td>
<td>Scorpio</td>
<td>210</td>
<td>208.5653</td>
</tr>
<tr>
<td>9</td>
<td>Sagittarius</td>
<td>240</td>
<td>239.7611</td>
</tr>
<tr>
<td>10</td>
<td>Capricorn</td>
<td>270</td>
<td>271.0289</td>
</tr>
<tr>
<td>11</td>
<td>Aquarius</td>
<td>300</td>
<td>301.9908</td>
</tr>
<tr>
<td>12</td>
<td>Pisces</td>
<td>330</td>
<td>332.3844</td>
</tr>
</tbody>
</table>

Let us, now, assume that the writers of chapter 5 in Genesis chose the NM in the Septuagint’s year of creation to take place when the MS was at the celestial longitude of 0 degrees corresponding to the beginning of the sign of Aries. This assumption is supported, for example, by Maimonides, who emphasized that ancient Jewish sages believed that Nisan's NM took place on a Wednesday, close to the beginning of "Tekufat Nisan".

At that moment, the RS is positioned at the celestial longitude of 2.1344°. When the MS reaches the celestial longitude of 30° in correspondence with the beginning of the sign of Taurus, the RS would be at the celestial longitude of 31.3406°. Consequently, the RS would, thus, have to complete the required number of full turns plus 31.3406 - 2.1344 = 29.2062° (as summarized in Table 1).

As a result, in order to find the RS at the beginning of the zodiac signs S(i) when a NM takes place, the RS would have to move through them in steps of a full number of years plus the corresponding values C(i) in Table 1 (calculated for the aphelion at 65.5°) which are between 28.75° and 31.25°.

If we return to Figure 5 in order to find the number of years that are necessary to advance with required steps surrounding the average value of 179.0833 (calculated in Section 2 above for the MS), we get the detailed results shown as in the left part of Figure 3.

By studying the marked values in Figure 3 it is evident that the writers of the chronology of the Septuagint version used these exact calculations to determine the ages of the patriarchs when they begot their following generations. With the contemporary constraint applied in accordance with the ancient view that sun-moon conjunctions are related to historical milestones (see Discussion), it was possible to build up the general structure of the ages of the patriarchs based on the above calculations. Rounded, the numbers came out as 230, 205, 190, and 170 replacing 228, 209, 190 and 171 for the ages of Adam, Set, Enoch and Keenan when they became the fathers of Set, Enoch, Keenan and Mahalallel, respectively. The first zodiac sign for which the MS was expected to advance with a step slightly over 30 degrees, was the sixth sign. Consequently the choice for the age of Jared, the 6th patriarch, was 162, very close to the calculated value of 160. The ages of 167 and 188 for Methuselah and Lemech were similarly chosen to correspond with the eighth and ninth zodiac signs, for which the calculated values were 168 and 187.

However, if we assume that they wanted to relate the NMs to real conjunctions occurring at the beginning of each sign, they knew that the number of years should not match the numbers in Figure 5 exactly. The real conjunctions would differ from the average as a result of the difference between the RM against the MM.

Neugebauer 1969 points out that, as mentioned above, even before the 4th century BC the Babylonian astronomers had records indicating that the time steps between real NMs are not constant.

The maximum deviation in degrees between RS – RM and MS – MM conjunctions had been determined by the Hipparchus-Ptolemy's model to be over ± 7°. It is, therefore, expected that the number of years between two consecutive real NMs occurring at the beginning of adjacent zodiac signs could vary from the given values in Figure.
5. However, the detailed astronomical calculation tools provided by Ptolemy (mid-2nd century AD) in the Almagest following Hipparchus general scheme (mid-2nd century BC) for the derivation of the estimated lengths of the real synodic months were not available when the bible was translated in the 3rd century BC. In fact, when we have used Ptolemy’s methods they did not lead us to a better accuracy in calculating the 0-2 year’s differences (except for one difference of 4 years) between our number of years corresponding to the set of NMs close to the mean value of 1791/12 years (Section 2), against the very large number of years incorporated by the sages to the Patriarchs in Genesis 5 (Table 1 A).

Moreover, the mean NMs satisfied a model of the rotation of the RS, which gave us a picture of the state of the art of contemporary astronomical achievements in the 3rd century BC: The ages (A) in Figure 1a describe the motion of the real sun during the year, an unprecedented scientific accomplishment. Chapter 5 of Genesis can therefore be considered a rare source text for understanding the historical developments of astronomy and the history of science in general, see Figure 7:

![Figure 7 left. The ages of the first 9 patriarchs and the celestial longitudes of the mean NMs: Seven of the calculated average NMs motion of the sun (circular dots in red) compared to the ages of the patriarchs and the corresponding steps of the RS (squares in blue), calculated by using the astronomical eccentric of epicycle models in Figure 6. In Figure 7 right the mean to the maximal RS's distances are assumed to be 18/19. (See Discussion.)](image)
Figure 8. The eccentric visualization of the motion of the sun, and the biblical patriarchs' ages as related to the signs of the zodiac.

Figure 8 combines the following:

a. The biblical ages of the patriarchs and their corresponding celestial longitudes as calculated in Table 1 assuming that each patriarch was born at the exact beginning of a mean zodiac sign (represented by the squares).
b. The astronomical calculations of all celestial longitudes of the Mean Moon as in Figure 3 and 5 (represented by the circles).

The Figure summarizes the visualization of the ancient world, relating the patriarchs' ages when they begot their following generations with a new zodiac sign. This indicates their belief that each patriarch “controlled” his corresponding zodiac sign.

In Figure 8 we show the span in years of the patriarchs’ “kingdoms” each attached to a zodiac sign. Those are the years when the scepter departed from the patriarchs to the next generation, as shown in the Figure: For example the year 228 in the figure signifies the end of the “Kingdom of Adam” starting from the year of creation.

With the ages of Keenan and Hanoch chosen by the writers of the chapter in Genesis to be 165, there is no doubt that the motion of the RS around the Earth was their visualization of the years as related to it. Those two ages were needed by the sages who wrote the chapter to complete the motion of the sun during, approximately, ¾ of the solar year.

So, what about the remaining ¼ of the year? As explained in the Discussion, the sages assigned Noah control of the remaining 3 zodiac signs.
Based on this assumption, we found that the straightforward astronomical calculations suggest the year that Noah’s “kingdom” ended to be as follows:

6175 months after the birth of Noah the MS changed its longitude by:

\[ 6175 \times 29.1060917^\circ = 179730.11636^\circ \]

and

\[ \frac{179730.11636^\circ}{360^\circ} = 499.2503 \text{ years.} \]

Indeed, adding 3 months (= 0.2503 years [+0.12 days]) to the time of year represented by the celestial longitude of the MS when Lemech begot Noah, would bring the year back to the celestial longitude of 0\(^\circ\), its original longitude when Adam was created.

6175 months equal 499 years and 3 months (plus a fraction of a day), indicating that Noah ended his kingdom at his 500\(^{th}\) year. Accordingly, in the Septuagint and the Masoretic versions of the bible, Noah begot Shem when he was 500 years old indicating that the year 500 in the bible was also carefully chosen, which also provided the closest value to bring the sum closer to the value of 12 x (179 + 1/12) discussed in Section 2.

4. DISCUSSION

During the years 1970-71 researchers D. Barag and Y. Porath from the Hebrew University of Jerusalem, led the excavations of the synagogue near Kibbutz Ein-Gedi (Figure 9). The newly excavated synagogue was built in the lowest geographical point of the world, 410 meters below sea level near the Dead Sea. The excavations uncovered a highly relevant inscription, an engraving that relates the zodiac signs with the names of the patriarchs (Figure 2).

The ancient inscription provides solid proof to our basic assumption detailed in the sections above that the ancient Jews, like those who lived in Ein-Gedi as early as the first centuries AD and even prior to it, believed that there is a connection between the zodiac signs and the antediluvian patriarchs. The names of the first 9 patriarchs were engraved along with their equivalent zodiac signs stating from the 1\(^{st}\) pair, Adam and Aries, through the 9\(^{th}\) pair, Lemech and Sagittarius.

As for the three final zodiac signs, their names are written in a curious way: As in I Chronicle 1:1-4:

“1: Adam, Set, Enosh,

2: Kenan, Mahalalel, Jered,

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3: Henoch, Methuselah, Lamech,

4: Noah, Shem, Ham, and Japheth.”

Noah is mentioned along with his 3 sons as the patriarch related to Capricorn and Aquarius Pieces.

The last verb states that all 4 patriarchs Noah and his sons are related in the ascription to the remaining 3 (!) zodiac signs Capricorn and Aquarius Pisces.

The word and ו (in Hebrew) is used 3 times in the inscription: The first time it is used to show the relation between Noah and his three sons, all of whom were born before the deluge: Noah Shem Ham and Jefet. This format of expression was used in Hebrew to denote a family unit and relates the three sons to Noah (תפיו םח םש). The second time the use suggests that Capricorn and Aquarius (and) Pisces all relate to Noah along with his three sons. The third time the word and connects the last two months of a Hebrew year which is short of the solar year by 10.88 days.

In this work we are interested only in the first two: It is clear that the engravers had to relate the four names they used to three zodiac signs. Moreover, when engraving the last three zodiac signs they used, as emphasized, the word and to connect them. If one claims (as, for example, in an enlightening study of the inscriptions by Magnes 2015 that only Capricorn and Aquarius were connected, and related to Noah, while the last zodiac sign is connected to one of the three sons, the question that arises is why mention all three sons?

Our derivations above suggest that all three final zodiac signs, Capricorn and Aquarius-Pisces, were linked to the 10th and last antediluvian patriarch the father of Shem, Ham and Yefet. The chronology of this is detailed in Genesis 11 against that of the 10 antediluvian patriarchs discussed in Genesis 5.

In summary of the previous sections, unlike some scribal attempts made in the past to relate the years mentioned in Genesis 5 with planetary cycles (as relating 777, the years of Lamech in Figure 1b,D, to the “cumulative synodic periods of Jupiter and Saturn”, Barnouin 1970 our approach is exact and straightforward. Our comparison between the calculated values of the number of years required to advance the RS – MM conjunctions in steps of 300 through the different seasons of the year and the ages of the patriarchs as presented in Figure 7, leave hardly any doubt that the ages of the patriarchs were determined by the sages who wrote the chronology of the bible based on astronomical calculations.

Moreover, it is known that the ancient world’s estimates of the sun’s distance from the Earth were erroneous. For example, the ratio of r/R = 1/24 used by Ptolemy to express the difference between the maximal and average distances of the sun from earth is off by a factor of 2 from the presently accepted ratio. In fact, taking into account that the constant celestial longitude of the aphelion could have been measured to be 630, if calculations were performed in the late 3rd century BC and a larger ratio for the sun's distances would have been assumed, an even better agreement would have been achieved as shown in Figure 7 right/ for which a ration

Therefore, Figures 7 left and right) show that examination of the method used by the sages to select of the ages of the patriarchs is invaluable to the study of the history of science and astronomy in particular.

The motion of the RS was recognized by the ancient world as early as the basic biblical chronology in Genesis was put together. It can contribute to our understanding of the development of science side by side with the development of common beliefs regarding the role of the sun and moon in shaping the world's history. Such beliefs were known to exist in the ancient world as expressed, for example, through a very specific statement made in the ancient reference of Pirkei DeRabi Eliezer (6th century AD):

"All the signs are servants to the sun-moon conjunctions and the generations of mankind, and on them the world sustains. And an expert in them is capable of understanding the connection between sun-moon conjunctions and the generations of mankind. And that is the biblical intention in stating [in Genesis 1, verse 14] – 'and let them be for signs, and for seasons'.”
Such beliefs of the role of the sun, the moon and the planets were also known in the Hellenistic culture as articulated by the Hermetic approach Bowker 2005, and played an important role in several other different cultures, as in the Inca’s myth, Kulmar 1999. They expected that the movements of the sun and the moon had meaning beyond the laws of physics and actually held metaphorical value as symbols in the mind of God. This approach is well described in L. Ness’ thesis in which he emphasizes the role of astrolog in Judaism in Hellenistic times, see Ness 1990.

Finally, Figure 1 calls attention to the known fact that the different chronologies were not derived independently. At least 7 patriarchs had the same age in both chronologies except for a difference of exactly 100 years. Only one version can be claimed as the original from which the other was modified (for reasons clarified in Cohen 2005 and 2018.

Our findings explain the logic behind the determination of the ages in the Septuagint version, a logic which cannot be applied to the ages A (in Figure 1) in the Masoretic version.

If we, as scientists, do not accept the claim that the writers of the chronologies chose the patriarchs’ ages randomly, we should prefer a scientific approach that explains them. As a consequence of our findings the ages A in the Masoretic version cannot be considered a part of the original biblical chronology.

REFERENCES

wealth, and Israel stands under planetary influence. 'Talmud2, Mas. Eruvin 56a. - the abbreviations in Hebrew of the 7 planets ruling the first hours on the mornings of the weekdays from Sunday [חלה] to Saturday [שבתא].

How To Overcome Commissioning Mega Project Challenges Safely In The Refinery

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ABSTRACT

The paper speaks about the challenges that we faced during commissioning clean fuel project. Contractor failed to submit the Utilities units to KNPC as full provision of turnover of a portion which means a complete unit that is ready for startup as per plan. The consequences on that was a delay on commissioning and our commitment with the consumers got affected.

We came into a decision on how to start the Units Partially while maintaining all safety standards. In addition to the need for continuing pre commissioning activities like pipe rack steam blowing activities and compensate the contractor’s delay.

Biography

Alyousef has joined Kuwait National Petroleum Company, KNPC in 2005 in Operations Department. He specialized in H-Oil Units, Hydrocracker Units, Hydrotreaters Units, Sulfur Recovery Units and Utilities Units. Currently he is a Commissioning Team Leader and responsible for Utilities and SRU units in clean Fuel Project. This project is a mega project in Kuwait that covers local and international requirements from various oil products and maintains the highest standards for both environmental performance and safety. This paper speaks about How to overcome commissioning mega project challenges safely in the Refinery.
Immigrant Student Achievement, Education Policy, And Evidence-Based Decision-Making: The Case For Large-Scale Reform

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ABSTRACT

International achievement measures such as the Programme for International Student Assessment (PISA) have consistently reported a significant achievement gap between non-immigrant and immigrant student groups – a result that is often referred to as the immigrant student performance disadvantage. This presentation examines immigrant student achievement results and education policies across a variety of internationally comparable jurisdictions in North America, Europe, and Australasia. Overall, the analysis considers the degree to which different national education systems are (under)utilizing evidence-based policies to support the achievement outcomes of their respective first- and second-generation immigrant student groups. Collectively, the discussion underscores the necessity of moving forward with significant large-scale reforms to facilitate more positive outcomes for this at-risk student population.
Understanding The Impact Of Organizational Change: A Qualitative Study Exploring Perception Of Pharmaceutical Sales Representatives

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ABSTRACT

Organizational change processes are common business practices that are utilized to aid in achieving competitive advantages. The pharmaceutical industry routinely implements organizational change practices due to an increase in the pressure to perform. Industry competitiveness has led many pharmaceutical organizations to focus on their structure and internal resources. While it is common for pharmaceutical organizations to shift their focus as it relates to market demands and priorities, new initiatives often lead to a shift in organizational structure or change. As the global market continues to move at an accelerated pace, pharmaceutical organizations have turned to implementing change measures faster than ever before.

The purpose of this paper is to uncover if and how pharmaceutical employees perceive organizational change events. Organizational change can be driven by many different factors that can impact employees directly or indirectly. Through qualitative research, conversational interviewing was utilized to capture data. Data analysis was performed through utilizing NVivo Qualitative Analysis Software to determine what common themes exist between the participants of the study.

Five common themes were identified as primary drivers in influencing an individual’s perception regarding organizational change. Employees are most frequently found to be negatively motivated by organizational change processes, impacting their ability to see the positive side of change. A lack of transparency leads employees to speculate leading to toxic, tense, and stressful working environments. Emotions such as feelings of stress, anger, anxiety, and fear were commonly found throughout change events. The lack of organization follow-up was found to have a negative impact on employee culture, where employees feel that their concerns are not being addressed. Lastly, impact on self (and family) leads individuals to contemplate what a change event means for them and how they could potentially be impacted.

This research concludes that pharmaceutical sales representatives perceive organizational change events in a manner which invokes feelings, stress, and negative motivation. Transformational leadership styles appear to be the most appropriate to manage change events in a manner that balances employee well-being and organizational outcomes.
Comparison of Generation Z College Student’s Learning Styles, Learning Preferences, and Classroom Behaviors
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ABSTRACT

An in-depth literature review showed that student learning styles fall into seven “categories:” Visual, Aural (auditory-musical), Verbal (linguistic), Kinesthetic (physical), Logical ( mathematical), Social (interpersonal), and Solitary (intrapersonal) Learners (Shafira et al., 2020). Generation Z, born between 1997 and 2012 (also known as the iGen or the Homeland Generation), currently makes up a quarter of the U.S population, numbering 74 million (Fourhooks, 2017, Forbes, 2017, Twenge, 2018). Generation Z’s learning preferences and unique ways of learning are self-centered and subjective. Gen Zs will choose the learning tools that best fit their self-learning needs, be it through the use of technology, visual aids, social media, hybrid, online, or in-class educational experiences (Rosahani et al., 2020).

Research provides substantive information that Generation Z college students' classroom behaviors, learning styles, and preferences are closely correlated to the following “categories”: Challenge, Curiosity, Decision-making, Leadership, Self-Motivation, and Technology.

Keywords: Generation Z digital natives, Generation Z college student classroom behaviors, Generation Z college student learning styles and preferences

Introduction

Generation Z, born between 1997 and 2012, is a generation not to be underestimated or confused with Millennials (Fourhooks, 2017; Forbes, 2017). On the surface, Generation Z may appear superficial and self-absorbed but look closely to see that they are not. Seemiller et al. (2016) found that Generation Z members described themselves as influential, thoughtful, loyal, compassionate, open-minded, and responsible. As an instructor with fourteen years of personal observational experience with Gen Zers, the members of this generation possess a strong social awareness, being pragmatic, individual thinkers, self-leading with clear career expectations, and self-defined individualism and values (Twenge, 2018). In the future, Generation Zers will lead companies to success while creating more innovative, sustainable markets, developing technology beyond traditional limits, and being stewards of global wellness. They will leave their legacies for others to follow for many generations (Twenge, 2018).

Gen Zs (also known as the iGen or the Homeland Generation) make up a quarter of the U.S. population, numbering 74 million (Twenge, 2018). This is the most racially and ethnically diverse generation, with nearly half identifying as part of a community of color (Spotify for Brands, 2019). Generational research (e.g., Twenge, 2018) has found that Gen Z is more socially cautious than previous generations; they are less likely to smoke or drink before the legal age, nor do they generally date before college. Gen Z is also more financially conservative, having watched their parents weather job losses during the 2008 economic recession. Hence, the potential for financial success is essential when making their education and future career choices (Twenge, 2018).

Generation Z and Technology

Most notably, they are the first generation "for whom internet access has been constantly available" (Twenge, 2018). Academics and popular media sources have identified them as more "technologically savvy" (Barnes & Noble College, 2018) than any previous generation. Two out of every three own a smartphone, and approximately 87 percent of Gen Zers log onto social media websites at least once daily (Twenge, 2018). Life without technology, for Gen Z, is...
unfathomable and untenable. In a survey, O’Boyle et al. (2017) found that Gen Zers will enter the workplace with exceptional technical skills. They also expressed apprehension about how the overuse of technology negatively impacts their interpersonal communication skills. In a study of four thousand Gen Z participants (Stillman, 2017), thirty-seven percent expressed concern that technology is weakening their ability to maintain strong interpersonal relationships and develop social skills. While these digital natives may bring an unprecedented level of technology skills to the workforce, there are some apprehensions about their ability to communicate and form strong interpersonal relationships (Kick, 2015).

It is no coincidence that Gen Z students' classroom behaviors display an obsessive need to have their cell phones accessible at all times. According to Mitus (2021), three of 10 Gen Z adults surveyed said they constantly use the internet. Furthermore, Generation Zs face the most severe consequences of iDisorder, a relatively new condition in which individuals engage in compulsive internet and technology use. The brain's ability to process information changes because of overexposure to technology. This obsession with technology can result in psychological, physical, and social disorders, including depression, anxiety, repetitive motion disorders, and sleep deprivation which can impede classroom behavior and performance (Mitus, 2021).

"When you are getting a device at five years old," Mitus said, "you have not developed that ability to regulate yet. So, it is easier to lose the impulsivity of using the technology and have a harder time breaking away from it."

Furthermore, Mitus points out that the average media use of American teens is about nine hours a day, with 54% admitting they are on their phones too frequently (Mitus, 2021).

Gen Zers' use of technology in the classroom encompasses individual, team, and group activities. First, one must understand that Gen Zers are the first generation of digital natives fluent in technology, which means they think, speak, and know how to apply technology. They are native technology speakers and do not remember a time without it (Dingli & Seychell, 2015). Because of their unique upbringing, these individuals are used to fully immersed in technology, whether through their smartphones, tablets, or laptops. They rely heavily on these devices to function in their personal lives and as college students.

Gen Zs are information seekers. Students will search for sources that provide the most information in the fastest amount of time. According to a report by Forrester Research (Schmidt, 2019), eighty-four percent of Gen Z “multitask with an Internet-connected device while watching TV—using on average 1.5 other Internet-connected devices (e.g., laptops and cell phones).” Gen Zs crave speed; they desire multitasking with a singular focus; they prefer having access to technology in many environments. Though these assumptions lack empirical evidence, this author’s experience with Gen Zs classroom use of technology can attest to these assumptions. As a growing population, this generation has a different approach to everything from socialization to activism. Educators and researchers must understand how their digital upbringing has impacted them and acknowledge that this generation will have a vastly different view of things, including getting an education. (Hoffman, 2022)

Generation Z and Education

In an “Innovation Imperative: Meet Generation Z” conference, held on November 18, 2014, Joseph E. Aoun, president of Northeastern University, discussed Gen Zers' entrepreneurial and independent attitude that extends to higher education. Gen Zers want a more customized college experience in which they can design their course plan of study and majors. Students expressed the need to be engaged in creative and innovative classroom activities. They want opportunities to develop self-leadership and entrepreneurship (Aoun, 2014). Additionally, Gen Zs are more likely to enroll in college and have one or both college-educated parents. Older members of Generation Z are less likely to drop out of high school and more likely to be enrolled in college. The point is that this generation will be present in college classrooms for at least the next ten years. Educators and researchers must understand how their digital upbringing has impacted them and acknowledge that this generation will have a vastly different view of things, including getting an education. (Aoun, 2014)

A Barnes & Noble College study, "Getting to Know Gen Z" (2013), showed that eighty-nine percent of respondents rated a college education as valuable and saw college as a path to a good job. The study also pointed out that despite their natural independence, Gen Z’s ability to process large amounts of information qualifies them to be outstanding students. Additionally, Gen Z. Respondents indicated that they thrive when challenged and allowed to be more fully
engaged in their education. Three major factors contribute to members of Gen Z attending college: 1. career preparation, 2. interesting course work, and 3. professors who care about student success. A total of sixty-four percent of respondents said they liked advanced college courses. (Barnes & Noble, 2013) (Seemiller, 2016).

Seemiller, 2016, pointed out that Gen Z has solid opinions and preferences for how they learn and what they expect from their educational experience. These insights give colleges several significant opportunities to attract and influence how the next generation will connect to their college experience. Thus, it would behoove colleges to capitalize on Gen Z's ability to self-educate and co-create content (Seemiller, 2016). Traditional learning materials could be supplemented and enhanced with digital opportunities. Using technology in classrooms allows instructors to use tools familiar to Gen Z and will enable students to take a more active role in their education (Pearson, 2018). A study by Vu et al. (2020) found that Gen Z students thrive in hybrid learning environments where they can use technology to find answers to problems on their own and want to be in classrooms where they can use their devices to their advantage.

Finally, while it is true that many rely on their parents for guidance, they trust their friends, classmates, and work colleagues to act as sounding boards, provide emotional support, and give validation. Gen Z's emphasis on social safety carries over into educational preferences. They seek schools that are "emotionally safe." (Twenge, 2018), where they can share new ideas without being unfairly judged. Also crucial for Gen Z students are safe spaces on campus, where they feel protected and secure in their identities and beliefs. Students who think their instructors create a safe space tend to perceive them as caring, respectful, and supportive (Selingo, 2018), demonstrating the importance of making students feel emotionally and psychologically safe in the classroom. From an observational perspective of student classroom behavior, from 2015 to the present, this author has observed the transformation in students who transition from having a speculative trust to conservative trust to complete trust in the instructor—achieving this required being genuine and honest, starting with answering their questions and addressing their concerns. Another practical approach was setting boundaries and expectations for their classroom behavior. This created a safe space for students to feel they could openly share their thoughts without worrying about being judged or criticized. Lastly, honoring student confidentiality.

A study by Seemiller et al. (2019) found that Gen Z is a "rationally-minded" generation and that Gen Z students value instructors who show them compassion and kindness in addition to being knowledgeable about their respective subjects. Selingo (2018) found that, when asked what they like most about their favorite instructor, Gen Z students liked instructors who: made the class exciting and involving; were enthusiastic about teaching; communicated clearly; talked to them both in and outside of course; and understood and supported them in areas where they were unprepared or behind. Hoffman (2021) found that Gen Z students valued welcoming instructors willing to recognize and appreciate students as learners and people. Similarly, Seemiller et al. (2021) found that Gen Z students wanted personable instructors who "take the time to create relationships with them." These improve classroom behaviors associated with active participation in group/teamwork, class participation, individual performance, and academic performance.

Research Questions

Research questions in this paper are: What learning styles and preferences are commonly observed in classroom behaviors? What learning styles are most adaptable to student-centered activities, i.e., team and group projects, class discussions and activity participation, individual-centered projects, and assignments? What learning preferences are consistent with the student’s educational experience? How can instructors enhance the classroom learning environment that is most effective for Gen Zs?

Methodology

Classroom behavior observations from 2015 to the present of Generation Z college students’ learning styles and learning preferences of first-year students, sophomores, juniors, and seniors in a Principles of Management course.
Instructor Influence on Student Learning and Development

Generation Z first-year students entered college in the fall of 2015; research has shown that their expectations are different, and instructors need to understand them to engage them in successful learning experiences effectively. (Trevino, 2018) The question to be asked is, what are their expectations, and do these correlate to their learning styles, learning preferences, and classroom behaviors? The observed differences between Gen Zers and Millennials prompted the need to study Gen Zers' learning styles and classroom behavior more closely as it relates to Gen Z learning preferences and the use of various learning tools and educational formats. i.e., technology, social media, visual aids, hybrid, online, and in-class educational experiences.

Instructors play a significant role in developing and influencing student learning. One goal is for instructors to implement ways to improve course assignments and their effectiveness (Mohr et al., 2017). Mohr suggests possible revisions of course assignments that encourage and communicate a productive perspective toward coursework matters. The key to this is considering which current course assignments seem to work well with today’s Gen Z students. The point is that assignment material used to teach Millennials does not necessarily meet the learning demands of Gen Z students. They are also equipping Gen Z students with skills relevant to their learning preferences. Questions instructors should consider revising course assignments: (a) What assignments appeal to students? (b) Do assignments allow the students to explore career applications? (c) Does technology support trustworthy sources and productive use of the information? (d) Can expectations for collaboration be guided or altered for those who prefer or need to work alone?

Mohr recommends that instructors improve course assignments and student learning experiences to avoid issues. First and foremost, do not assume that students will know the expectations for assignments. Thus, Seemiller and Grace (2016) suggest that instructors provide relevance to assignments. Instructors should carefully explain the rationale and value of assignments, highlighting how the project helps students learn what is helpful in their personal and work lives. Suggested ways for instructors to enhance student learning are (a) Give choices and a sense of autonomy while providing guidance. (b) Explain how assignments can influence students’ personal and work lives. (c) Be more purposeful in assigning team/group work. Explain the rationale for working in teams or groups and what individuals’ responsibilities are while collaborating to solve a problem. (d) Require students to combine skills and critical thinking strategies for individual and team/group projects.

This author had additional opportunities to observe Gen Z's classroom behaviors from 2015 to the present, demonstrating individual work and shared teamwork. The criteria used to measure individual work were assignment rubrics and participation in class. Teamwork was measured in three ways. Collaboration, cooperation, and being responsible for their share of the work. Another observation was their different levels of reliability, consistent performance, and self-discipline. Also, they were generally cooperative, helping their teams establish effective and efficient routines and ensuring everyone equally participated in the work by using clearly defined roles and tasks. An essential aspect of being acknowledged is the differences in maturity levels between sophomores, juniors, and seniors. More academically experienced students willingly assisted other students struggling with their assignments.

Essential Learning Styles, Learning Preferences, and Classroom Behaviors

Challenge

Gen Zers like a challenge, but they enjoy challenging themselves even more. This is where their creative side comes through. Coming up with their ideas and being challenged by bringing those ideas to fruition is what excites and motivates them to perform. This author has observed that students take a common sense and practical approach to things. They thrive in group situations where they are actively engaged in hands-on projects that are challenging and creative. Joyce Maroney (2018) states, “Gen Zers love a good challenge. A great way to keep them focused and busy is constantly challenging them with something new. They have a craving to learn and know everything. On top of this, they are multi-taskers. Maroney’s study showed that more than 60% of Gen Z said they want to impact the world. So, make sure you have plenty of challenges for members of Gen Z and lots of opportunities for them to grow and learn, or they may begin to look for educational options elsewhere. (Maroney, 2018)
Curiosity

A helpful classroom behavior observation is that Gen Zs have no interest in being boxed into one path or role. Their curiosity drives their interests and goals. To prepare themselves, they want opportunities to explore many ideas they are curious about. Being imaginative and conceptual allows them the freedom to ask questions and brainstorm with their instructor and fellow students. They like working on projects that enable them to freely express individual ideas and that challenge their personal learning experiences.

Having access to more information than any other generation at their age, they have the unique opportunity to establish a curious and open mindset that will allow them to be successful in many areas, including entrepreneurship (Seemiller and Grace, 2017). As explained by Singh (2016), entrepreneurial curiosity is a positive emotional and motivational drive toward investigating the entrepreneurial framework, learning entrepreneurship-related tasks, and incorporating new experiences to improve business (Singh, 2016).

Decision-Making

Per Seemiller (2016), Gen Zs prefer learning through exploration, experimentation, and hands-on learning. As observed by this author, they demonstrate a systematic approach to decision-making and seek factual and accurate information to get things done the right way. According to the American Student Association Research and Insights (2021), Gen Z’s decision-making cycle encompasses self-reflection, consultation with trusted advisors and personal connections, and online research, including the internet and social media. Gen Z’s decision cycle starts and ends with self-reflection. They think about what they want and need. After reflecting, they cycle through advisors, instructors, online research, and further self-reflection until they ultimately decide what direction to take. They want to make informed decisions based on facts and accurate information. They also want to be known for being responsible and having good judgment when making decisions. When it comes to decision-making, they see decision-making as having a purpose, value, and meaning for them.

Additionally, the American Student Association research (2020) showed that seventy-five percent of Gen Zs are making professional decisions, and 66% are making educational decisions. Student Research Foundation (2017) reported that fifty-nine percent of Gen Z respondents said a successful career allows them to help others, and 50% say that the social causes they are passionate about influence their career choices (Student Research Foundation, (2017). Included are Gen Z’s decisions about their lifestyles and financial security. Furthermore, Gen Zs feel they have a plan for their future which depends on making sound decisions based on their own needs and expectations.

Leadership

According to Claire Jollain’s (2021) study, leadership style assessments amongst Generation Z students found that Gen Zs are relatively homogeneous and demonstrate a desire to lead and be led that differs from other generations. Gen Zs responses showed they favored the democratic leadership style while rejecting the commanding leadership style with a mix of the visionary, coaching, and pacesetting styles. Daniel Goleman’s (2020) theory on different leadership styles briefly defines leadership styles in the following ways. Democratic: Reaching consensus before making decisions. Coaching: Goal-oriented. Giving advice and monitoring results. Visionary: Focusing on the big picture and final goal. Affiliative: Prioritizing people’s emotions and well-being. Pacesetting: Changing the pace and the standards. Commanding: Micromanagement. No room for feelings or individual input. Goleman's research showed that successful leaders possessed strengths in self-awareness, self-regulation, motivation, empathy, and social skill. Being direct, open, and having a clear vision for your team and company will attract and retain like-minded workers (Goleman, 2020).

Blazek (2016) suggests Gen Z might prefer a culture that enables change and the need to lead toward a technology-driven atmosphere, automating processes and utilizing technology in every aspect of the business to optimize results. They also may prefer to work independently, not reliant on traditional office hierarchy. They may choose to seek their resources and encourage employees to seek out information immediately rather than wait for a conference call or meeting next Tuesday (Blazek, 2016).
A study by Agustia et al. (2020) showed that Gen Zs preferred the democratic leadership style for themselves and their organizational leaders. They believe that democratic leadership can be used as a solution to building leadership attitudes in the environment, and democratic leadership can be used to control the desired situation. Furthermore, democratic leadership will strengthen organizational goals and promote strong collaboration and cooperation among its members. Therefore, we must pay attention to our environmental conditions to adapt our leadership styles to meet the organization's needs as a whole (Agustia et al., 2020).

This author observes that given leadership opportunities in the classroom, Gen Zers will rise to the occasion by setting an example and being role models. After all, they want to prove that they can succeed to others and themselves. More to the point, they want to see others succeed as well. Their attitude is that if they help others achieve, that person will help someone else do the same. Gen Zs will use their leadership skills to empower others to see the benefits of collaboration, value team, and independent work, engage in creative and innovative processes and seek challenging ways to enhance their learning experience. Their commitment and ability to influence others to see the value of collaborative work will ensure the success of their endeavors (Aquas, 2019).

Motivation

According to Corey Seemiller, 2019.

“Gen Z’s motivation roils down into three primary themes or categories, and they’re very motivated by relationships, passion, and achievement. And so, when it comes to relationships, they’re motivated by not wanting to let other people down. Also, they are motivated by making a difference for someone. And they want to make sure that the things, the time, and energy that they’re committing to is going to make a difference, it’s going to make an impact” (Seemiller, 2019).

Seemiller says that this means that an educational setting is helping Gen Z build authentic relationships as instructors, advisors, and mentors on campus. Likewise, peer influence is significant on campus while these people are in college. Gen Zs are motivated by these relationships and think that instilling some time and various opportunities to get to know students on a more personal level can develop vital socialization skills. Gen Zs are motivated by passion and the idea that they want to advocate for something they believe in. As research shows, Gen Zs are very informed on social issues. Seemiller recommends connecting their educational experiences with those issues to the real-life setting by providing opportunities to employ case studies and other hands-on learning assignments (Seemiller, 2019).

This author’s experience with Gen Zs in the classroom shows them to be most motivated when they are engaged in projects around their ideas. As independent, original thinkers, they are motivated by the recognition they receive for their contributions. Another observation is how Gen Zs have learned to encourage others by setting an excellent example in group/team participation. As Rothman (2020) mentioned, students were motivated by teacher-student engagement when teachers had command over their subject areas and used their interactive teaching styles. In the workplace, Generation Z moves quickly and can produce more in a shorter time than other generations. They have learned that change and diversity are a way of life and are expected. They are not limited by geography, proximity, or time zones for work. They want to change the world, be socially responsible, and know their work is essential. A challenge to supervisors/managers is keeping the Generation Z learner/employee interested and motivated while focusing on the small details. Measure your Gen Z individual on performance and accuracy, so they understand that the two are equally important. Leaders need to step up and provide mentorship opportunities for Generation Z. Since Gen Z will be trained in the latest technology, this will be both an opportunity and a management challenge (Rothman, 2020). This shows that the openness to experience, and responsibility of the university student, is directly associated with positive aspects of academic motivation, such as thinking, persistence, and achievement, which indicates that those responsible and open to experiences have more intrinsic motivation and more adaptive learning strategies (Rothman, 2020).

Technology

Generation Z’s dominant learning style is that of a “Digital Native” and extremely tech-savvy (Renfro, 2012). Generation Z learners prefer learning through technology, retrieving information through the Internet, search engines, e-books, webinars, YouTube, Facebook, other educational sources, and social media. (Roashani et al., 2020). Their
multimedia and various forms of technology are complemented by their use of different electronic devices such as smartphones, iPads, tablets, and laptops. This author has observed that they learn better when they can obtain information and answers immediately from any source available on the Internet (e.g., YouTube videos, social media such as Facebook, Snapchat, Twitter, etc. (Renfro, 2012).

Instructors and administrators need to understand and accept that Gen Zs, also known as “digital natives,” are fluent in technology, which means they think and speak the technology language and learn how to apply it. Whether they are engaged in-class, individual, or team activities, they are adaptable to using various specialized programs. Furthermore, technology is their second language. They are fearless when it comes to learning new technology. Their curiosity about technology is limitless, so they are open to exploring new devices and applications. When it comes to technology for personal use or use in the classroom, the faster access to information, the better. The more information they can gather from various sources, the better. Gen Zs are curious by nature, so when they are interested in something, they want to be able to satisfy their need for information in the quickest way possible (O’Boyle et al., 2017). According to Cilliers (2017), instructors teaching Gen Zs must be prepared to teach using state-of-the-art software, hardware, and digital, technological, and social media to bridge the gap between students and instructors.

**Instructor Teaching Techniques to Enhance Gen Z Learning Experience**

The research questions developed in this paper are: What learning styles and preferences are commonly observed in classroom behaviors? What learning styles are most adaptable to student-centered activities, i.e., team and group projects, class discussions and activity participation, individual-centered projects, and assignments? What learning preferences are consistent with the student’s educational experience? How can instructors enhance the classroom learning environment that is most effective for Gen Zs?

Several academic professionals have offered sage advice, recommendations, and lessons learned from years of experience to answer these questions. That being said, successful faculty have the natural ability to incite students’ passion, captivate their attention, and intrigue their minds. Faculty can utilize today’s technology to work in their favor. They need to understand what technology makes Gen Zers “tick” to keep their attention long enough to learn (McCridle, 2016). McWilliams (2015) advises that instructors need to shift their mindset and make a shift from traditional roles of teaching to student-instructor partnerships that create a collaborative, reciprocal process through which all participants have the opportunity to contribute equally to decision-making, implementation, investigation, or analysis. Duoit et al. (2017) emphasized the need for faculty to acknowledge that students possess great ideas about improving their classroom engagement. Likewise, students must recognize that instructors have extensive knowledge and experience in their field of study. When instructors and students partner, the willingness to share opportunities for learning and a two-way exchange of intellect will transpire. This is not easy; Duoit et al. (2017) suggest that instructors take simple and small steps and start collaborating with students to design in-class activities, encourage participation, co-create course assignments and grading options, teach courses using engagement techniques, and implement course lectures with interactive visual aids. As Duoit et al. (2017) said, “faculty must bring to the classroom a repertoire of knowledge and skills to keep the attention of Gen Zers, who are prone to boredom easily and quickly.”

**Conclusion**

As more and more Gen Zs enter college and the workforce, there will be ample opportunities for researchers to conduct longitudinal studies focused on Gen Z preferred learning styles, learning preferences, and classroom behaviors that will validate these findings. Researchers must focus on studies exploring Gen Zs across multiple demographics in colleges and the private business sectors. This will provide a more accurate composite of Gen Z’s four-year academic experience and a clearer understanding of their preferred learning styles and learning preferences that influence their classroom behaviors. This information will assist instructors and administrators in better understanding Gen Zs’ learning needs and preferences. The goal is for instructors to partner with Gen Zs in creating a learning environment that allows students to explore opportunities that utilize their learning styles and accommodate their learning preferences.

Another factor to consider and study is students’ self-awareness of themselves, their developing learning styles, and preferences which give them a more enriching learning experience. Gen Zs are challenging institutions and instructors
to partner with them to have a meaningful and purposeful learning experience. Instructors need to understand and recognize that they cannot use the same teaching methods with Gen Zs as they used with Millennials (Seemiller, 2016). The more known about Gen Zs, the better to ensure that they receive an effective and sustainable education that will prepare them for life, their careers, and the business world. Specifically, educators need to leverage digital media to make more time for active learning during class. A recent report from Barnes & College (2021) shows that Gen Z predominantly learns by doing and prefers participative learning environments. Gen Zs surveyed said they like a combination of visuals and listening learning to understand a new subject better. This includes watching recorded lectures, watching other online videos, reading online study guides, and simply researching information on the web. Generation Z sees virtual experiences as a way to engage with others nearby and far (Barnes & Noble 2021). Blended learning models usually leverage in-person instruction techniques with teacher-led online modules and self-paced learning. Students shared that participating in independent study, small group learning, and whole-class instruction, whether online or in person, and in-class collaboration enhances their social nature and has effectively engaged them in education (TeachThought, 2022). According to Pearson, 57 percent of Gen Z show they put a high value on face-to-face interaction and group learning, both on and offline. And eight out of ten Gen Zs also choose to study with friends, often via Zoom or TEAMs and other video apps. In conclusion, partnering with Gen Zs will give educators first-hand insights into how to better provide Gen Zs with what they need to be academically successful and prepared to enter the business world.

Biography

Dr. Dawn Sime is a Professor of Organizational Leadership in the Department of Business Administration & Management at Southern New Hampshire University, School of Business.

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21\textsuperscript{st} Uncertainty As A Catalyst For Creative Change: Adapting Higher Education To The Challenges Of The Anthropocene & Fourth Industrial Revolution
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ABSTRACT

Contemporary social, economic, technological, and environmental challenges pose grave risks with no certainty of resolution. These challenges, primarily of our own making, are represented by the ideas of both the Anthropocene and the Fourth Industrial Revolution; two inter-related trends that are rapidly changing how we live, work, and connect to each other. In order that higher education may find relevance, and help us survive, it must undergo adaptation to suit the realities of 21\textsuperscript{st} century uncertainty. In this piece, we argue that the higher education of today should be more flexible, creative, and focused on the critical skills suited to the realities of the current historical epoch.

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ABSTRACT

The present article aims at shedding some light to the question whether Mexico’s boom in remittances between 2015 and 2021 was the result low rates of unemployment in the USA or higher revenues of drug trafficking made by Mexican Criminal Groups. We found that Mexican migration to the USA took off up 2019 and accelerated with Covid-19 pandemic. Since higher rates of unemployment matched with larger number of remittances and a spike in drug overdose deaths in the USA, a hypothesis aroused stating that Mexican remittances could be related to drug trafficking revenues. An Exploratory Data Analysis (EDA) found a normal negative correlation (not causation) between US-unemployment rate and remittances from 2015 to 2019 but an abnormal negative correlation from 2020 to 2021. We conclude that the record level in Mexican remittances between 2020 and 2021 could be the result of an increase in Mexican migration but also from a windfall in drug trafficking earnings mirrored in a spike of drug overdose deaths in the USA.

Keywords: Remittances, Organized Crime, Mexico, US Opioid Crisis
Female Principals’ Conflict Management Skills In Female Dominated Teachers’ Rural Primary Schools: Experiences Of Primary School Teachers

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ABSTRACT

Gender discrimination against female rural school leaders, which stems from historical societal perceptions of the female roles, still endures in this twenty-first century. Some societies do not embrace the fact that females have the abilities while in leadership positions like their male counterparts. Despite global and country-wide efforts to have women treated equally with males, systemic inequalities are still embedded in cultural and traditional practices. Female educational leaders continue to endure discrimination and inequity concerning professional treatment and advancement despite efforts to encourage equality among all persons. The purpose of this study was to investigate female principals' conflict resolution skills in rural primary schools dominated by female teachers in South Africa's Gingindlovu Circuit. Qualitative method was adopted for data collection through face-to-face interviews. Purposive sampling procedure was used to select ten (10) participants for the study. The study's findings revealed that female principals have conflict management skills despite their gender roles, which have been cited as reasons why females may not perform well as managers. Some gender roles, such as nurturing and accommodating, have been identified as important to female principals in assisting them when resolving conflict in the workplace where female teachers predominate. However, they still need to learn more about skills of managing conflict in schools. The study recommends amongst others that female principals be workshopped on how to manage conflict in a school situation soon after they have been appointed.

Keywords: conflict management, female principals, Gingindlovu Circuit, rural primary schools
The Impact Of Strategic Emphasis On The Disclosure Of Narrative Information

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ABSTRACT

Purpose: The purpose of this study is to examine how a firm’s strategic emphasis (SE) on value appropriation (VA) over value creation (VC) is associated with the readability of narrative disclosures in annual reports. As strategic emphasis affects financial performance, and such outcomes are framed by linguistic argumentation in annual reports, we expect that annual report readability varies with firms’ strategic emphases.

Design/Methodology/Approach: Based on 64,602 firm-year (7,911 unique firms) observations for the period from 1994-2018, we find that a firm with an SE on VA over VC increases the level of readability in 10-K narratives measured with the Bog Index (BOG), as developed by Bonsall and Miller (2017). To examine the effect of SE on a firm’s narrative disclosure in an annual report, we measure SE as advertising expenses minus research and development (R&D) expenses, scaled by sales. We further find that managerial ability (developed by Demerjian et al. (2012)) strengthens the positive association between SE on VA over VC and annual report readability.

Findings: The results indicate that a firm’s SE on VA over VC will increase readability by (1) showcasing firms’ current profitability driven by VA initiative, (2) facilitating greater transparency about information environment, and (3) attributing “improved profitability” to managerial excellence. Conversely, a firm’s SE on VC over VA will decrease readability by (1) hiding current financial difficulties driven by VC initiative, (2) structuring bad news with an imprecise and cautious approach with legally dubious texts to shelter a manager’s wealth from transitory losses, and (3) attributing “earnings difficulty” to a wide range of exploratory efforts regarding potential markets, leading to hard-to-understand and lengthy texts.

Originality/Value: This paper’s contribution is to that readability in an annual report may be a firm’s effort to publicize performances by revealing (hiding) the success (failure) when a firm relocates two dissimilar resources, either by extracting value through advertisements or creating value through R&D. Thus, our paper contributes to the management, accounting and finance literature that investigates the relationship between resource deployment (i.e., SE) and textual properties of corporate financial disclosures (i.e., readability).

Keywords: Strategic emphasis; Value appropriation; Value creation; Annual report readability; Managerial ability
Leading Doctoral Research: Tips And Strategies For Dissertation Chairs
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ABSTRACT

This paper provides an overview of the doctoral research process and presents a discussion of strategies and practices for dissertation chairs that lead to both student success and program completion. An overview of the doctoral dissertation process is presented by chapter emphasizing the importance of clarity and alignment throughout the dissertation. Additionally, a number of helpful strategies are presented. These include discussion of alignment threads, dissertation chapter outlines, editorial support, communications, time management, committee composition, the IRB process and instrumentation issues. Finally, a discussion of strategies for post-graduation publication of dissertation research is presented.

Keywords: Dissertation Research, Dissertation Alignment, Dissertation Chairs, Time Management, IRB Process, Dissertation Publication
Will You Walk In My Shoes?  
Drawing From Cross-Cultural Literacy Praxis To Find Voice In Culturally Empowering Frameworks  
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ABSTRACT

The US is regarded as a land of immigrants and is increasingly more culturally and linguistically diverse resulting in educational opportunities that propel diverse bi/multilingual learners as global scholars. There exists critical need for culturally responsive and empowering pedagogical practices in education that reflect cultural awareness and acknowledgement. Identity is formed through cultural literacy practices. There are many parallels that exist across Mexican American and Native Hawaiian cultures and each bring strong cultural components such as language that is ethnically tied to culture and heritage and harnesses academic and linguistic capital that can be channeled into literacy development both in and out of formal school spaces. Sound pedagogical practices grounded in the Sociocultural Literacy Theory draw on the positive impact that participation in social interactions around culturally organized activities have to drive the academic and linguistic development and success of diverse bi/multilingual learners. A focus is determining how our literacy practices unfold and the roles that participation in social interactions and culturally organized activities have on learning. Critically important as we (re)claim language, literacy and learning as a cultural repository and as a medium for communication highlighting the power for bi/multilingual learners to learn across cultures about literacy, learning and language through culturally empowering teaching and learning frameworks. We are unaware of what it is to walk in someone else’s shoes. Drawing from cross-cultural literacy praxis, we find voice in our practices. Emphasis is on the language and literacy skills that Mexican American and Native Hawaiian bi/multilingual learners contribute to their learning experiences from both their educational experiences and their literacies of life and how these resources are used to mediate their learning.
Taking On A New Meaning Of Physics
Mathematization For Teaching In Teacher
Education Processes

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Abstract

This is a documented reflection on five previous investigations that seek to characterize an alternative conception about the "mathematization of physics for teaching" developed in the "teaching and learning of physics" research group. During the last nineteen years, we have asked ourselves a sequence of research questions that investigate how physics teachers understand the relationship between physics and mathematics in physics teaching process. In 2003 the idea of "mathematical beauty" was studied in the beginnings of quantum mechanics, suggesting that there would be a difference between the way scientists assume the physics/mathematics relationship and the way physics is taught. In 2010, we asked ourselves if there would be research in this field that would allow transformations in teaching focused on equations as the whole of the mathematical-physics relationship, finding that there are at least three trends. In 2019, based on two case studies, we confirmed that despite research in the literature, many students continue with the same reductionist idea about this relationship. In 2020, we made a proposal based on all of the above showing a possibility of educating the teacher's thinking for new understandings in this regard. The main conclusion is that it is possible to develop mathematization processes in the classroom from three specific phases that educate scientific thought. The first phase tries to make the student aware of the existence of phenomenology and describe it. The second phase educates the study of nature systematically, constructing the meaning of the organization of a physical system. The third phase teaches to explain and argue until students achieve an explanatory model. These phases can be a criterion to guide the sequence of activities in a class, a set of classes, or an entire course. They have been worked on and tested in "didactics of physics" courses in a physics teacher training career.

1. Introduction

The first work in this sequence was (Castiblanco, 2003) who studied the scientists' ways of proceeding when producing a new explanatory model, such as that of quantum mechanics taking the Dirac production case. Different aspects arise, such as the search for the physical meaning of mathematical expressions, the mathematical beauty as an organizational criterion, the mix of mathematical and physical methods to answer fundamental questions, the observability of nature, and the conception of language as communicative processes beyond being a simple set of symbols, among other aspects. These results put a challenge to re-think educational processes that even today continue far from achieving students learn to build world’s representations coherent for them.

The second work was the doctoral thesis of (Vizcaíno & Terrazzan, 2013), in which the author detects three trends in the European, Iberoamerican, and Anglo-Saxon world around research studying the concept of the mathematization of physics in educational processes. The first trend describes teachers who focus the methodological class design around an approach to the physics phenomenon taking real systems under study with close or daily situations to the students, and where the introduction of mathematical models occurs at the end of the process. The second trend focuses mainly on the experimental aspect, giving importance to the hypotheses formulation, organization of physics systems, and the construction of explanations based on research questions. The third trend bases its strategy on the study and analysis of mathematical models that support the phenomenon explanation, expecting students understand the occurrence from the equation treatment in different formats, such as programming, simulating, or recreating situations that show the equation behavior, among others. In the same research, there is evidence of a distance between the results of research in this field and routine teachers' practices. At least in a case study at a public university in Brazil, the
The author observes that what usually occurs in a traditional classroom is a teaching process around mathematical modeling but in a much-simplified version than the one proposed by the researchers. This is consistent with what was found in textbooks usually used by physics teachers, where the tendency is to explain the phenomenon starting from the equation.

From these first results, we ask ourselves about what should be the characteristics of the academic spaces for teaching physics so that teachers in training can approach the objective of assuming classes as job opportunities for the mathematization of physics in teaching. Based on these results, we wonder how future physics teachers understand the mathematization of physics.

In a case study, Ruiz (2019) observed a didactics of physics course using the three trends mentioned above as prior categories of analysis of the students' discourses. The author found that they refer to the use of equations to solve theoretical problems when describing how they learn physics. But when they are asked to explain physics, they mainly opt for the phenomenological approach in a simplistic version compared with research results in this field. However, it is difficult for them to build arguments relating the occurrence phenomenon with the behavior of equations, even though they can use the equation to solve problems.

Complementing the previous one, we wonder how pre-service teachers relate physics with mathematics in their learning processes. This time in a context where they must talk about the physics they know. Here, (Pérez, 2019) found that they are not conscious of this relationship since they assume "Mathematics is the physics language" defining "language" as the phenomena description with an equation. When they have to reflect on the broad meaning of the word "language" as a process that allows communication, creates words' senses and significances, and allows us the construction of collective imaginaries, among other aspects, they express in general, they had never thought of it in that way.

Since we collected enough evidence about how confusing the relationship between physics and mathematics is for pre-service teachers, especially planning physics teaching processes, we decided to move forward a research based on design. In this context, a didactics of physics course arose into an undergraduate teacher training program, trying to educate them to integrate the three trends previously detected but in a single process.

It is about starting with the phenomenological approach where the student will become aware of the existence of natural events that used not to be problematize on a daily basis but can be characterized from a scientific perspective, involving personal interests to create in the student desires to study the situation. During the second phase, students learn to characterize a physical system and learn to transfer conditions from a real system to an idealized system. It implies developing a language that allows them to describe what they observe, but also the acquisition of skills to observe the system. Finally, the third phase consists of guiding synthesis processes that allow the student to build their explanatory model, for which they learn to use different types of language representation.

Gonzalez (2022) found that this way of putting physics in the school scene changes the paradigms in pre-service teachers around different aspects of physics teaching and also of physics itself. These teachers planned classes in this perspective and recognized a real possibility of reconstruction of their scientific discourses. Also, allow them to get out of the traditional way of transmitting knowledge and develop autonomy in strategies creation that responds to the needs of their context and guarantees understanding of the science.

2. Literature review about meanings of “physics mathematization” in physics teaching

We part from the assumption that, although Physics Teaching has Physics as its work content, the relationship between Physics and Mathematics in Physics evolution is different from how this relationship is worked in a physics teaching process (Vizcaino & Terrazan, 2020). In other words, learning about how the language of Physics was mathematized during its evolution, does not imply automatic learning of how the Mathematization of Physics should be presented in the classroom. Language, therefore, understood in the sense of describing and communicating, must transit between the languages of Physics adopted by the teacher to explain certain physical phenomena and the student's language who need to understand aspects of nature. It is a process that should not present the "Mathematization of Physics" in the same sequence throughout history, but guide students to develop their Mathematizations of physical phenomena.
Anna Krygovska (1968) introduces the term “Mathematization” in her teaching proposal aiming to indicate the application of Mathematics in different contexts. The author criticizes the tendency (in the 70s) to teach Mathematics as if it were autonomous and independent of its applications. She says that, in teaching, Mathematics must be applied to natural situations in domains external to Mathematics, in such a way that solving a situation is a “real problem”, demanding from the student both the application of mathematical methods and the use of a mathematical theory already developed. In both cases, it is necessary to understand the difficulties of passing from a mathematical scheme to reality, which would allow overcoming some naive views, such as; the mathematical scheme is the same as described reality or, the mathematical solution to a problem is to find a number and not to find the coherence of the scheme that describes reality.

In turn, Freudenthal (2002) presents a definition of Mathematization guided by the characteristics of Mathematics. He says that Mathematization is a process that has three components: (1) axiomatization, (2) formalization, and (3) schematization. For this author, axiomatizing has to do with the organization of knowledge; formalizing is a process of adapting and transforming language from symbolizations, and schematizing requires generalizing language in the form of laws and rules through abstraction, which adapts to reality. The author draws attention to the fact that, in the educational field, it is customary to restrict the Mathematization process to one of these components and that, usually, in teaching, only formalizations are presented. Steiner (1968) also develops the idea of Mathematization for the Mathematics teaching. He defines six fundamental activities possible to achieve the Mathematization of a situation: 1-observation, 2-description, 3-idealization, 4-logical-local analysis, 5-axiomatization, and 6-application.

In general, these authors agree that the process begins with the observation and the establishment of some conditions or restrictions to the system to be able to represent it schematically. Also, they propose to take the student in the evolution of levels of complexity, demanding greater or better logical organizations of the system.

Respect for Mathematics in Physics Teaching, Redish (2006) defends the idea that understanding the relationship between Physics and Mathematics implies being able to distinguish between what it is to do Mathematics and what it is to use Mathematics in the development of Physics. It means that the physicist does not learn Mathematics and Physics separately joining after the two knowledge, but takes the physical world, describes its concepts through mathematical representations, and, thus, can guarantee a physical interpretation of such representations for, later, assess its validity in the physical world.

We infer, then, that it is not in the internal logic of Mathematics that the validity of an expression of Physics is found, but in the coherence that such an expression presents to describe nature. This thinking way, when transposed to Teaching, can be interpreted as follows: it does not make much sense to teach pure Mathematics as a prerequisite for studying Physics, hoping that this already guarantees the understanding of the formal descriptions of Physics, since learning Mathematics itself does not teach how to use it in other contexts. However, learning Physics implies learning how to use symbols and relationships between symbols to be able to express ideas and build explanations of specific behaviors in nature.

According to Redish and Gupta (2009), and Redish (2021), understanding a Physics equation is not limited to connecting symbols with physical variables and mastering operations through the equation. “An important component concerns the connection of the mathematical operations in the equation with their physical meanings and the relationship between the equation and its implications in the physical world”. (p.12). In this sense, Bing and Redish (2009), also argue that solving Physics problems in the classroom implies developing complex reasoning skills in the student, leading them to be aware of the reason why they can or should choose to use certain schemes mathematicians, and not others, in the solution of Physics problems, being aware that mathematical schemes are more than mathematical algorithms or isolated equations.

In the problem identified by these authors, we can see that the understanding of Mathematics as a language of Physics, from the student's point of view, would be far from the conception with which scientists have constructed Physics throughout its history. The identification of this type of problem justifies the need for research in Physics Teaching, which offers results to learn to modify the naive conceptions of teachers and students concerning the solution of problems in the learning of Physics. In this topic, the literature currently presents a trend of teaching proposals around Modeling, as a process that allows educating students in appropriate skills for the construction and understanding of explanatory models of physical phenomena.
In the teaching proposal based on Modeling, it is generally assumed that guiding students in modeling activities facilitate their training in skills necessary for mastering the language, with which physical phenomena are represented. According to Hestenes (1997), the use of modeling in Physics Teaching allows creating conditions to learn Physics more effectively, understanding Physics as a complex network of models that are interrelated in a system of theoretical principles. The author states that “Models are units of structured knowledge used to represent observable patterns in physical phenomena. Thus, 'physical understanding' is a complex set of modeling skills, that is, cognitive skills to produce and use models. (Hestenes, 1997)

Other authors such as Angell et al. (2008) consider that Physics Teaching should educate students to understand the nature of Physics, as a modeling company, which means training them so that, through reasoning, they can connect experimental representations with conceptual ones. These authors name their proposal as an empirical-mathematical approach, for which they propose two types of activities: one that aims to lead the student to use multiple representations of the physical phenomenon, and another that aims to emphasize the production of Physics based on the construction of models. As for the types of representations, they are defined in Guttersrud and Angell (2010): as conceptual, pictorial, and graphic and it is important to decide what to teach and how to teach.

In turn, Uhden et al. (2012) and Karam (2012) share the same perspective on modeling cycles, with gradual levels of Mathematization in the formulation of physical laws. They claim that it is necessary to start with the reality of the world to advance in the elaboration of physical-mathematical models, not in a linear way, but in a flexible way until working with calculations of values. Thus, what they call “Mathematization” is the preliminary phase to work with value calculations, this phase being subdivided into several moments, ranging from perceptions of the world to the organizations of the schemes that explain it, with their interpretation and validation in the reality.

According to Karam (2012), the “Mathematization of Physics” in recent years is based on the definition of Mathematics as the structuring of physical thinking. In his thesis work, the author concludes that to improve Physics Teaching, it is more appropriate to develop, in the student, skills that allow him to use Mathematics, as an instrument to think about the physical world, skills that he calls “structuring”, which differ from technical skills. According to Karam and Pietrocola (2009), one of the most relevant structural skills is the ability to identify the essential aspects that justify the presence of a mathematical structure in a model.

3. **Sequence of research on the mathematization of physics in teaching**

3.1 **Reflecting on the relationship between physics and mathematics based on Dirac's ideas**

In (Castiblanco, 2003) a fundamental idea of Dirac that "A physical law must possess Mathematical beauty" (Kragh, 1990) p.286 is analyzed. Although the concept of beauty is not defined, it can be inferred from his work that it refers to the forms of organization of the subject and the forms of presenting said organization, about the knowledge of Nature. So mathematics would have to do with how the subject builds his knowledge. However, the work of the physicist-mathematician must seek harmony between mathematical expressions and the possible physical interpretation that they offer because this guarantees that the language by which a phenomenon is described has physical meaning. According to this author, the creative principle of the scientist would be given by a certain "strategy" developed to decide what allows him to know that he is understanding Nature, and such a strategy would be based on the procedures of mathematics.

In the context of quantum physics, the doctrine of observability frequently refers to the quantities that must be introduced into physics being those that can be observed or measured experimentally. However, there was a discussion at the time about whether all "observable" quantities were measurable. The "observability" in Dirac includes in the first place everything that can be measured. However, the condition of being measurable is given with an appropriate elaboration of mathematical conditions, for that measurable mathematical entity. That is not everything measurable from the mathematical point of view it can be assigned to a practical situation. So that within the set of observables, some are assigned a practical situation and others are not. Then, there would be some observables that are measured and others that are not measured.

This way of thinking led Dirac not to focus the problem on how to account for an experimental fact, but on how to generate new interpretations of the phenomenology under study. For which the search for physical meaning becomes
a criterion for choosing the mathematical structure to establish the theory and not something deduced from a scheme constructed to quantify the results of concrete experiments. The idea of "physical sense" developed by Dirac would imply in pedagogical terms that it is important to "build with the students" each explanatory scheme that they need to learn. That is to say, it is not possible to learn a description of Nature taking for granted and elaborating the entire scheme on the basis of an explanation, but rather the theory would make physical sense to the student to the extent that he "constructs" the scheme that supports an explanation.

3.3. Three trends of research in physics teaching from a mathematization physics ideas

Vizcaíno (2013) asks himself How do researchers understand the relationship between Mathematics and Physics? What is the impact of this understanding on the decision about what students should learn and; What kind of problems should students solve to learn Physics? To answer, he made a qualitative analysis from the perspective of Uwe Flick (2009) elaborating a text from a set of materials in order to build a “new reality” to be interpreted. He found the next three trends:

1. Mathematization from mathematical modeling Mathematics is understood as a language of Physics, in the sense of offering a set of tools for the study of physical phenomena, in such a way that the mastery of such tools improves the possibilities of understanding, by allowing to decide which are more appropriate depending on the ability to represent a given physical fact. This category is based on the idea that the main function of Mathematics in Physics is to allow the formulation of scientific laws through sets of representations that involve, within themselves, rigor and the ability to describe phenomena. Therefore, students must learn to apply mathematical schemes for the best description of certain experimental results, that is, the teacher must go beyond teaching a series of steps to solve typical theoretical problems, teaching to understand the reason for each step, for example, through software that forces them to organize such steps or through the problematization of the use of certain mathematical schemes in the description of a phenomenon, which would lead the student to develop abstract representations and explain the physical meaning of mathematical calculations.

2. Mathematization using physical-mathematical processes. The main difference with the previous one is that in the former, the emphasis of Physics teaching revolves around the knowledge and understanding of Mathematics models, while here, the emphasis of teaching is on the use of Mathematics processes, as guides for the construction of scientific knowledge. That is, in the first one, it is a necessary condition that the student be trained initially and/or simultaneously in certain knowledge of Mathematics and oriented towards the understanding of the schemes, which appropriately describe the phenomenon, while in this category, it is inferred that the student must learn Physics through training to build possible models, but not to come to an understanding of established models assumed to be natural and unique. Such a process of building models involves the formulation of the problem, which in turn requires the construction of conceptual models, that is, the elaboration of accurate representations, increasingly complete and consistent with their own language and ways of understanding, but also consistent with the knowledge, scientifically, shared in the classroom.

3. Physics is studied from the phenomenological description, relating daily life and sensory experience with physical concepts. Unlike the first category, there is no work on understanding the models of Mathematics, since the objective is to arrive at the use of representations close to such models, which are later formalized. It also differs from the second category, in which the criteria for guiding the students' ways of reasoning are not based on the processes used in Mathematics, but emphasizes the reflection on the student's own ways of proceeding and their possibilities of thinking, where the experience sensorimotor is at the heart of the way in which physical phenomena are thought and Mathematization is a final step in the teaching process that is part of the formalization of the results found. It is inferred that the student elaborates an explanation of the phenomenon, starting from the expression of his reasoning based on his physical intuitions, to continue with the qualitative analysis of the physical quantities involved in the phenomenon and, later, advancing in quantitative analysis, which will allow him to organize a formal description of the system.

3.3. How pre-service physics teachers understand the mathematization of physics; two cases study

In two different case studies, it was analyzed how teachers in training assume the mathematization of physics in a subject a "didactics of physics I and II" courses offered at the 8th and 9th semester, into the undergraduate physics teachers’ program was observed during two different academic terms with different students. The first one has 14
participants, and they have to study different ways of using experimentation, technologies and literature in teaching processes and in the end, they had to design a physics class. There, the discourse was analyzed seeking to identify what their imaginaries are about the mathematization of physics. As criteria to observe classes the next indicator was designed.

Table 1. Analysis categories with their respective class observation indicators

<table>
<thead>
<tr>
<th>Explanatory Models</th>
<th>Physic systems characterization</th>
<th>Phenomenological approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Assumes mathematical structure as the foundation of explanation. Presents the equation, but does not use it to explain.</td>
<td>• Organize physical systems by comparisons</td>
<td>• Sensory experience is privileged to understand the phenomenon. Describe the relationships that occur in the phenomenon.</td>
</tr>
<tr>
<td>• Present the equation to explain.</td>
<td>• Outlines physical situations through symbols and representations</td>
<td>• From the description makes the analysis of the phenomenon.</td>
</tr>
<tr>
<td>• Solve problems from mathematical schemes</td>
<td>• Formulate hypotheses as a starting point for the study of a physical problem</td>
<td>• Develops reflection and debate on the physical problem in question</td>
</tr>
<tr>
<td>Understands the use of units of measurement and dimensional analysis of equations</td>
<td>• Project processes to corroborate your hypothesis</td>
<td>• Analyzes the physical phenomenon from history and epistemology.</td>
</tr>
<tr>
<td></td>
<td>• Identifies variables that intervene in the physical phenomenon prior to the use of the equations</td>
<td>• After understanding the phenomenon, look for the relationship with the equations.</td>
</tr>
</tbody>
</table>

It was found that in general they assume the mathematization of physics as the use of equations, but at the same time, they consider mathematics as a limitation when teaching. Likewise, it was found that it is difficult for them to formulate hypotheses as a starting point to address a phenomenon, since they expect to be informed of what should happen with the phenomenon. Given that during the course they were frequently asked to construct explanations and arguments and that their first intention is to explain by writing an equation, in response to which they were asked to expand on the information regarding the equation, they became aware that they did not have enough knowledge to get out of the traditional explanation. On many occasions they had difficulties in making the corresponding dimensional analysis, or they went from the equation to a diagram or drawing that supposedly broadened understanding, but was actually confusing. More info can be consulted in Ruiz (2019)

In the second group with 24 participants, they had to study the relationships between psychology, pedagogy and sociology theories with the physics teaching processes, and at the end, they had to design a class. Observing their speeches through the same observation grid indicated above, it was found that they assume that the language of physics is equations. However, it was notorious that when they participate in a debate or want to explain or argue their ideas, in general, they do not resort to equations but prefer a phenomenological approach. While when they present definitions of concepts they do so basically through equations. It was possible to determine that for most of the equations treated during the 16 sessions of each course, it was not evident that they had any knowledge about the epistemology, history or philosophy that underlies the formulation of an equation.
This work made the author's thinking change by mentioning that the importance and motivation to want to learn about teaching and learning physics is the pleasure and interest aroused in the training received in the physics didactics seminars. This training led to an interest in teaching physics, such that he wanted to learn more about this field. Therefore, being part of a teacher training research was an opportunity to learn more about the subject, and incidentally contribute something to the understanding and advancement of the issues that are developed in these specific training contexts. It can be added that in a very subjective way a curiosity and an interest in understanding and learning about mathematization have been awakened in me, that this can feed and modify my language to make an explanation, that is to say that it can become an important input to the time to exercise the teaching profession and also the interest in trying to continue researching and learning about the subject of mathematization. Students often feel uncomfortable focusing the entire explanatory process on the description of an equation, but they do not have the knowledge that allows them to do anything different from it. More info can be consulted in Perez (2019).

3. 4. An experience training teacher through a specific mathematization of physics process

Gonzalez (2022), gives continuity to the previous ones, in the sense starting from the findings in terms of the need to educate teachers for new understandings of the mathematization of physics. It was applied with the same course in another academic period with 20 students. Considering that this course has a special focus on a non-traditional education for physics teachers, he takes as another important reference, the dimensional perspective of didactics of physics formulated by Castiblanco and Nardi, (2018) which in turn is based on the need to train the teacher's critical thinking in Shulman perspective (2000), as well as to educate for autonomy, in his work as a teacher and researcher in the perspective of Tardif and Lessard (2005), Zeichner (1986), among others. In this way, the same "Didactics of Physics" course is designed, but this time training them to address physics concepts in a sequence of three steps: 1. Make the student aware of the existence of a physical phenomenon. 2. Teach you to characterize a physical system to study nature. 3. Guide them to build their own explanatory model.

During the final part of the course, pre-service teachers had to design and execute a class applying what they had learned, that is, their planning should contain at least three activities, one for each phase of the process, or more than three activities or moments in the class, as long as all three phases were completed. The data analyzed for this work was taken during the applications of the classes prepared by the physics didactics students. The research questions posed by the author were to what extent are the ways of working with a certain concept of physics modified, when the organization of the class is assumed in three moments around phenomenological, physical-mathematical characterization and modeling? What is the students' reaction to this way of organizing the class? What characteristics does the discourse of the teacher and his students have throughout the process? What will be the results in terms of understanding and conceptual mastery of physics? Data arise from the teacher’s narrative and an observation grid, which let construct the analysis categories presented next with its respective indicators, highlighting that these categories emerge from the process.
Table 2. Analysis categories and their indicators

<table>
<thead>
<tr>
<th>Category 1. Conceptualization of phenomena through debates</th>
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<tbody>
<tr>
<td>• Provide feedback on their knowledge by discussing it in debates.</td>
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<tr>
<td>• Expose their doubts in the classroom</td>
</tr>
<tr>
<td>• Recognize the phenomenology that is being studied</td>
</tr>
<tr>
<td>• Draw on knowledge of epistemology, history, and philosophy in the treatment of physical concepts</td>
</tr>
<tr>
<td>• Identifies the fundamental concepts associated with physical phenomena.</td>
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<thead>
<tr>
<th>2. Relate magnitudes in the explanation of the physical model and the physical concept.</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Identifies the magnitudes of the physical variables and associates them with the concepts</td>
</tr>
<tr>
<td>• Discusses different interpretations with their classmates</td>
</tr>
<tr>
<td>• Internalize the importance of the physical-mathematical process.</td>
</tr>
<tr>
<td>• Structures the verbalization of their ideas regarding evidences</td>
</tr>
<tr>
<td>• Gives an account of new ways of structuring their ideas both in the concepts of physics and in the concepts of physics education.</td>
</tr>
<tr>
<td>• Understand the importance of systematic observation, formulation of hypotheses, analysis and interpretation of results.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. Understanding the importance of a mathematical model.</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Recognizes the meaning of mathematical modeling goes beyond the equations.</td>
</tr>
<tr>
<td>• Develops processes of understanding the phenomenon, characterizing it, expressing doubts, building explanations and arguments.</td>
</tr>
<tr>
<td>• Assumes the language of mathematics as a way of organizing thought to study physical phenomena.</td>
</tr>
<tr>
<td>• Expose conditions and limitations that the equations have when describing a phenomenology.</td>
</tr>
<tr>
<td>• Explore various types of representation to communicate their ideas and conclusions.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. Discursive innovation present in teachers in training.</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Change their ways of thinking and interacting with classmates</td>
</tr>
<tr>
<td>• Support their ideas both from the other exact sciences and from humanities,</td>
</tr>
<tr>
<td>• Define criteria to reflect on what is changing in class.</td>
</tr>
<tr>
<td>• Makes contributions in the class, seeking to collaborate in collective construction.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5. Reflection on the conception of physics teaching.</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Becomes aware of their mastery or lack of it in scientific content and expresses it without fear when debating with their peers.</td>
</tr>
<tr>
<td>• Pose their own interpretations of the physical models discussed in class.</td>
</tr>
<tr>
<td>• Analyzes what a mathematization process of physics in the classroom means.</td>
</tr>
<tr>
<td>• Recognizes the importance of training as a teacher around the Dimensionality of physics teaching.</td>
</tr>
<tr>
<td>• Recognizes the class space as an agent of transformation of the participants’ thinking.</td>
</tr>
</tbody>
</table>

Below, three of the classes that were formulated by the pre-service teachers are described as an example, accepting the guideline of planning them in a process of mathematization of non-traditional physics, which were applied with their classmates.
Table 3. General description of the classes planned to deal with the contents of quantum entanglement, space-time and entropy

<table>
<thead>
<tr>
<th>Description of phases planned and applied</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Concept: Space and time</strong></td>
</tr>
<tr>
<td>1. Phenomenological approach: In this class the group began by distributing a paper about Newton's conception of space, the discussions with Leibniz about its validity. The dynamics focused on forming small groups made up of 3 or 4 students, after finishing reading, doubts about the text were clarified, some were presented and then the conception of space-time for Newton was explained, highlighting that in classical mechanics time was absolute and space isotropic and homogeneous.</td>
</tr>
<tr>
<td>2. Physic system characterization: after explaining this conception, an activity was proposed that consisted of looking at the deformation of a triangle and a pair of perpendicular lines, this with the aim of introducing the concept of Minkowski spaces that had a geometry different from the Euclidean that is used to describe Newtonian mechanics, finished the illustration with the latex, the whole course debated why Newton's concept of space-time was not real but was based on postulates that were not verifiable, after that it was indicated that space-time is neither absolute nor homogeneous nor isotropic, a small introduction to relativistic space-time was made, quickly going through Galileo's relativity and explaining the well-known paradox of the twins.</td>
</tr>
<tr>
<td>3. Explaining model: for this segment of the class, the students brought a computer simulation that showed the phenomenon, from this material they supported themselves to explain the trajectory that the phenomenon would have, finally, they described the relativistic Doppler effect and that is how the end came of the class.</td>
</tr>
<tr>
<td><strong>Concept: entropy</strong></td>
</tr>
<tr>
<td>1. Phenomenological approach: The students who are in charge of leading the session begin the class by asking their other classmates, what do they understand by entropy? Then they show a short video about the reaction that the mixture between citric acid and sodium bicarbonate has, after seeing the presentation a small discussion begins about what were the conditions that had to be given for the reaction to effervesce, the students launch their interpretations about the occurrence of the phenomenon, after introducing the class with this experiment and its feedback, we proceed to talk about the concept of entropy through history with Sadid Carnot and Clausius. After this little context, the students proceed to show an experiment through chemical reactions that released energy and thus begin to introduce the concept of entropy.</td>
</tr>
<tr>
<td>2. Physic system characterization: After the debate, the students in charge of carrying out the class begin to talk about the concepts of micro and macro state, in addition to that they mentioned the energetic processes through work and heat, which were illustrated with an experiment on the work of a piston in a steam engine, although the students did not delve into this specific topic, they also exemplified the concepts with a mill that has potential energy and makes its transition to kinetic energy, after illustrating with examples such as the energy transition, they show the graph of the thermodynamic cycle, especially the Carnot cycle, finally Ludwig Boltzmann's contribution to the concept of Entropy was discussed, especially in classical statistical mechanics.</td>
</tr>
<tr>
<td>3. Explaining model: In this section, after describing Boltzmann's contribution to the classic concept of entropy, students introduce the modeling process through a probabilistic experiment, where after seeing what the result was, the students who participants in the class discuss which probabilistic concept would best describe both the experiment and the use of probability in entropy, so the students talked about probability distribution, the concept of permutation and counting and even asked those who directed the class if they could say that the experiment they carried out was also related to the definition of microstate and macro state</td>
</tr>
<tr>
<td><strong>Concept: Quantum entanglement</strong></td>
</tr>
<tr>
<td>1. Approach phenomenal The class begins with a brief historical context on the development of quantum mechanics, after that they were asked to work in groups to discuss a document prepared by the teachers, after a few minutes the different groups are asked to join until they are two groups made up of students.</td>
</tr>
</tbody>
</table>
| 2. Physic system characterization: the implications of quantum entanglement are discussed, from the aspect that Einstein had in the development of this theory, as well as discussing the implications that
quantum entanglement has in the way of understanding the universe. Then one of the students goes on to explain an experimental set-up that was adapted to be able to entangle photons, questions arise from this set-up and about what type of particles have been entangled so far, 3. Explaining model: after having presented this experiment, they proceed to explain the mathematical model involved in this phenomenon. The students in charge of carrying out the class explain the mathematical model until their understanding possibilities allowed them. Finally, there is a round of feedback among all.

Font: Gonzalez (2022, pág. 34-36)

Results of various kinds were obtained, from very specific advances in the understanding of concepts or ideas to transformations in the discourse on their way of being a teacher, of learning physics and their processes from mathematization. The pre-service teachers made their own a way of working that allows them to get their students to assimilate the knowledge of physics from three phases, allowing them a greater coherence between the explanatory model, the characterization of the physical system and its phenomenological approach. Changes were also observed in the way of assuming themselves as teachers. The teaching professionalization work was enriched by devoting more time to class preparation, reading prior to preparation and analysis from the epistemological and history of the phenomenon to be treated.

Specifically, it can be highlighted, for example, that they reconstructed the meaning of the Minkosky diagrams when the notion of relative space and time was studied, also on the idea of macro states and micro states when the essence of entropy was analyzed, and also on the notion of quantum state when entanglement was studied, because previously, I did not have any clear idea about it despite having basic knowledge of it. It is noteworthy that as a result of this course they themselves concluded that they should continue delving into these issues to gain greater understanding, but they recognized that they now felt they had criteria to do so autonomously. At another level of results, it was observed that there was a high commitment to the design and execution of the class, beyond what they usually do, since they spent a lot of time reading and producing specific material such as audios, videos, simulators, writings, etc. experimental setups. Likewise, they took the teaching role very seriously. They argued that this was because they found teaching physics in a completely unconventional format appealing, and found it an interesting challenge. Also, there were results at the level of awareness of the importance of the role of the teacher as a transformer of the thinking of their students and through this way of transforming society. Well, they saw that around this process it is possible to educate for critical thinking, for analysis, to stimulate self-esteem in people and enrich the ways of learning of all students. Many questions remained that will have to be investigated further to complete this line of work around new ways of assuming the mathematization of physics in the classroom.

Conclusions

Results showed that the relationship between physics and mathematics in pre-service physics teachers, in traditional contexts is of utilitarian nature, in the sense that it is restricted to the equations mastery to solve problems. This fact contradicts the idea that many authors have shown about "understanding an equation in physics is not limited to connecting symbols with physical variables" Redish; Gupta (2009).

In general, historical, philosophical and epistemological aspects that could result from the explanatory capacity of different phenomenon representations are ignored. At least beyond illustration to students in chronological data or important names, and stories about the formulation of equations. In this aspect (Vizcaíno & Terrazzan, 2013) (Vizcaíno & Terrazzan, 2020), have found similar results in other contexts which would allow us to infer that this problem could be common in different countries, but especially there is a distance between physics teaching and research results in physics teaching.

Despite the above, it has been shown that it is possible to develop mathematization processes in the classroom that overcome these limitations, as was the case with the training of teachers to plan a physics class in three consecutive phases. 1. Phenomenological construction, when students take conscious about the existence of an especial fact with the nature. 2. Physics System characterization, when students learn to identify parts of a system maintaining studying
the nature, giving hypothesis, identifying variables, constants, understanding the difference between real an ideal system but acting as a scientist. 3. Explanatory model construction, when teacher can guide a process to students create their own concept’s structure.

The training of physics teachers should contribute with their research so that processes identified as necessary for learning physics are brought to the classroom. This is the case of the mathematization of physics for teaching. In this work we do not stop at just mentioning this need. A series of investigative works have been carried out for several years that allow us to present a methodology to develop mathematization processes in the classroom. This series of investigations open the doors for other work and new ways of assuming the teaching role with responsibility, always supported by research processes of their teaching work. The path is marked and we must continue.

References


KEYNOTE
Watch, Listen, Participate, Learn:
How To Facilitate Interactive Engagement
Belinda Dunnick Karge, Ph.D., Concordia University Irvine, USA

ABSTRACT
How to engage every student in diverse classrooms is a constant challenge for educators, especially during the past few pandemic years. This interactive session will provide the participants with research-based engagement strategies for supporting learning. Dr. Karge will engage educators as they learn how to differentiate and accommodate lessons to support every student in their classroom (e.g. K-12 or University students). Learn to assist your English Language Learners with academic conversations and support students with activities designed to encourage higher order thinking, depth of knowledge, socialization, emotional support and ultimately academic success. Learn simple formative assessments, ways to adapt curriculum, and effectively group students. Come join the fun and experience a few strategies you can use to enhance your own teaching.

During this session participants will:
- Be introduced to eleven research-based engagement strategies
- Learn to implement these strategies in online, hybrid or face-to-face learning situations
- Learn to use simple formative assessments in a fun way

Biography
Dr. Belinda Karge is the Coordinator of Curriculum and Instruction and a Professor of Doctoral Studies in the Educational Leadership Program at Concordia University Irvine as well as a Professor Emeritus from California State University, Fullerton. She taught at both the elementary and high school levels and served in various leadership roles in public education prior to moving to the university. Dr. Karge is an expert in research-based instructional strategies. She is the author of a series of articles and strategies on engagement. Her professional record demonstrates a consistent pattern of scholarly and creative activities including research, publications (three textbooks, five curriculum texts, six book chapters, several educational tools, over 140 articles). She has received a multitude of awards for her teaching and service to the profession. She was honored with the Council for Learning Disabilities Floyd Hudson Outstanding Service to the Field of Learning Disabilities National award and the Association for Childhood Education International (ACEI) service award. She is a sought-after presenter and coach who has made plentiful referred presentations to international, state, and local groups of school district employees and has keynoted conferences. She travels extensively as a consultant for the U. S. Department of State Office of Overseas Schools and is a member of the Exceptional Needs Advisory Committee for U. S. Overseas Schools.
Strategies for Implementing Critical Success Factors for Improving Information Technology Information Systems’ Performance in Financial Organizations

Sherri L. Williams, Walden University, USA

ABSTRACT

Information technology infrastructure library (ITIL) business leaders lack strategies for implementing critical success factors (CSFs) to promote organizational effectiveness and project success. As a result, ITIL leaders may experience less project success if CSF strategies are not effectively implemented. Grounded in the balanced scorecard (BSC) theory, this qualitative multiple case study aimed to explore strategies ITIL business leaders use to implement CSFs successfully to improve organizational efficiency for project success. The participants comprised five ITIL business leaders in the financial industry located in the southwestern region of the United States who successfully implemented strategies to implement CSFs to improve organizational efficiency and project success. Four themes emerged from thematic analysis of the data: organizational performance-CSF metrics, risk, quality, and business development. A key recommendation is for business leaders in financial industries to use CSFs to identify process areas that improve organizational performance for business alignment, customer satisfaction, and better product or service quality. The implications for positive social change include better working conditions for process improvement workers, employment longevity, healthy working relationships, and job satisfaction leading to community improvement that ultimately benefits citizens.
LIFO Accounting Distortions
In The Oil And Gas Industry
Cindy Greenman, Utah Tech University, USA
David Olsen, Utah Tech University, USA
Derrick Esplin, Utah Tech University, USA

Introduction

Last-in-first-out (LIFO) is a method of method that is widely used in the United States by publicly traded companies for the tax advantages that it provides. It is based on the premise that the company sells the inventory asset that was most recently acquired. Consequently, this inventory method permits the matching of current income with the most recently acquired, higher cost of goods sold and lowest amount of inventory, which then results in lower net income and lower tax costs (Li & Sun, 2017).

Companies have been using LIFO for decades to decrease their taxable income. However, in order to do so, they are required to use this method for their financial accounting as well, even though it can hurt the bottom line results (Broughton, 2022). This is referred to as the “conformity rule” under the Internal Revenue Code section 472 (Li & Sun, 2017).

In 2021, it was estimated that 15% of companies listed in the S&P 500 utilized LIFO as their principal method of inventory, while 50% utilized First-in, First-out (FIFO) on their annual reports and the remainder utilized average-cost methods or a combination of methods. With inflation close to a four-decade high, a spotlight has been put on this accounting method that is only allowed here in the United States under the U.S. Generally Accepted Accounting Principles (GAAP), but is not allowed to be used under the International Financial Reporting Standards (IFRS). This spotlight is expected to increase the number of companies choosing to utilize this inventory method (Broughton, 2022).

Prior Research

The accounting valuation of the inventory if LIFO is being utilized is typically lower than its current market value when under a period of inflation. Consequently, the values of the inventory listed on the balance sheet under LIFO are clearly understated, while the higher amount of cost of goods and the lower amount of tax liability are then reported on the income statement. Maurice Moonitz was one of the earliest accounting theorists to point out the balance sheet distortions caused by LIFO’s understatement of inventory values (Moonitz, 1953).

The enhanced measurement of periodic income results from LIFO’s better mating of current sales prices with current costs. Because current costs are closer to replacement costs, the result is a gross profit measurement which many believe is more sustainable and represents a higher quality of earnings. Conversely, the balance sheet’s distortion of the current value of inventory produces a measurement of inventory and current assets which is understated under inflationary conditions. The amount of the understatement is a function of the level of price increases, the pattern of inventory changes, and the number of years of LIFO use (Coffee et al., 2009).

Jennings, Mest and Thompson (1992) wrote of the inflationary period of the 1970’s reporting that almost 25 percent of the manufacturing and merchandising companies traded on the New York Stock Exchange (NYSE) and the American Stock Exchange (ASE) were using LIFO. However, by the 1990’s, a period of relatively low inflation, that percentage had dropped to approximately 5 percent. In their 2022 article, Matheson and Brosy reported that LIFO was once a prevalent policy utilized over several decades. However, as inflation and corporate tax rates fell, the advantages of utilizing LIFO were diminished. In the United States C-corporations account for less than 40 percent of net income among businesses, yet they receive over 80 percent of the tax benefits of using LIFO. Of those industries that utilize LIFO the most, the petroleum trade is by far the largest benefactor, although its piece of LIFO reserves changes with oil prices. In their study, Matheson and Brosy reported that the petroleum sector share of LIFO reserves transformed
from 27 percent to 65 percent from 2011 to 2016, with an average value of 50 percent.

Another unexpected, more recent problem being experienced by some businesses applying LIFO is that of recent supply shortages. With LIFO the higher cost of sales generates lower pretax earnings as long as inventory keeps increasing. The flip-side of applying the LIFO method occurs when the ending inventory level drops below the beginning inventory balance. As the higher costs of inventory are consumed, the company needs to start tapping into their lower-cost inventory levels. This then creates a “phantom income” that the LIFO method had produced and let the company defer. This is more commonly known as LIFO Liquidation (Yeo and Yeo, 2022).

The study done by Li and Sun in 2017 was an update on their previous paper from 2014. Their paper, like ours, focused on the oil and gas industry but was more focused on the belief that LIFO was going to be repealed with the imminent convergence to IFRS. While the acceptance of IFRS does not seem so prominent as it was in the past, the idea of LIFO being repealed is not a dying issue. Many of the prior presidential administrations have proposed the elimination of LIFO based on the estimated tax revenues it would raise.

In their 2010 journal article, Coffee et al. also discuss the “pending” adoption of IFRS and its implications to those publicly traded companies that utilize LIFO as their inventory valuation. Their paper focused on the liquidity measurements and comparing them with a reconstructed current cost balance sheet liquidity measurement. Their concentration was more toward whether or not the adoption of IFRS would have a material impact on the balance sheets of those publicly traded companies that use LIFO or if the distortions would have a limited impact. Their results showed that the use of LIFO inventory valuation did produce material accounting distortions and they recommended the elimination of LIFO based on the idea that their study provided evidence that those material distortions would be eliminated for some publicly traded companies and give a clearer picture of the corporate financial situation.

According to a 2020 report by Zekany companies should not be “leery” of LIFO, only cautious, for certain companies who wish to perform an examination between corporations such that an inventory adjustment is needed. The research found that LIFO redirects cash flows and on a statistical point, measurable differences appear between LIFO and FIFO ratio calculations. This research also found that LIFO does distort most activity and most liquidity ratios, it has imperceptible effects on most of the profitability ratios.

**Methodology**

While LIFO is utilized across all industries, we limited our study to only the gas and oil industry for purposes of this paper. We also limited our sample to those companies based in the United States that have a positive LIFO reserve and data complete enough for analysis. We excluded companies with negative or no LIFO reserve or incomplete data. Relevant figures covering the years 2016 through 2021 were used for these particular companies.

The corporations we studied were used to recognize the stage of accounting distortions consequential to the utilization of LIFO. Particularly, we evaluated working capital, gross profit, inventory turnover, and current ratio built using the information reported in the financial statements and adjusting for the amount of LIFO reserve. The formulas used to adjust the data are as follows:

- **Year-end adjusted inventory** = year-end reported inventory + LIFO reserve
- **Beginning adjusted inventory** = beginning reported inventory + LIFO reserve from previous year
- **Average adjusted inventory** = (Year-end adjusted inventory + beginning adjusted inventory)/2
- **Adjusted inventory turnover ratio** = (cost of goods sold – LIFO reserve)/Average adjusted inventory
- **Adjusted gross profit** = Sales – adjusted cost of goods sold
- **Adjusted working capital** = Reported working capital + LIFO reserve
- **Adjusted current ratio** = (reported current assets + LIFO reserve)/Reported current liability

The percentage variance between the adjusted inventory turnover ratio and the amount reported as inventory turnover ratio leads to the accounting distortion in inventory turnover ratio. The accounting distortion in gross profit is derived from the percentage variance between the adjusted gross profit and the originally reported gross profit. The accounting distortion in the current ratio arises from the percentage variance between the adjusted current ratio and the originally reported current ratio. Similarly, the working capital distortion is calculated as the percentage variance between the
adjusted working capital and the originally reported working capital (Li & Sun, 2017).

**Empirical Research Results**

During an inflationary period, LIFO allocates the most recent prices to cost of goods sold and oldest prices to remaining inventory. The outcome is then the maximum cost of goods sold, lowermost taxable income, peak tax savings and bottommost inventory values being reported. LIFO reserve, described as the surplus of current cost (or cost of replacement) of inventory over the reported LIFO value, is anticipated to be a positive amount when inventory is undergoing an increase in price. All tables are generated using Microsoft Excel.

Table 1. LIFO Reserve (2016-2021) in Millions

<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>XOM</td>
<td>Exxon Mobile</td>
<td>14000</td>
<td>5400</td>
<td>9700</td>
<td>8200</td>
<td>10800</td>
<td>8100</td>
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<td>5588</td>
<td>2749</td>
<td>4513</td>
<td>5134</td>
<td>3937</td>
<td>2942</td>
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<tr>
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<td>87</td>
<td>155</td>
<td>75</td>
<td>124</td>
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<td>92</td>
<td>97</td>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td>DK</td>
<td>Delek US Holdings, Inc.</td>
<td>0</td>
<td>3.4</td>
<td>14.9</td>
<td>1.5</td>
<td>9</td>
<td>3.5</td>
</tr>
<tr>
<td>MEAN</td>
<td></td>
<td>4985</td>
<td>1666</td>
<td>2896</td>
<td>2682</td>
<td>2974</td>
<td>2230</td>
</tr>
</tbody>
</table>

Table 1 displays the total dollar amount of LIFO reserve for each of the five oil companies. Exxon Mobile has the highest LIFO reserve in each of the six years, and therefore the greatest prospective dollar amount accounting distortion in inventory. Delek US Holdings, Inc. has the lowest LIFO reserve for the past three years consecutive years, and thus consequently the lowest potential dollar amount accounting distortion in inventory. We can also clearly discern that the overall LIFO reserve increased dramatically from 2020 (average of 1,666) to 2021 (average of 4,985).

Table 2. LIFO Reserve as a Percentage of Inventory

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<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>XOM</td>
<td>Exxon Mobile</td>
<td>96.43%</td>
<td>28.65%</td>
<td>52.35%</td>
<td>43.25%</td>
<td>63.56%</td>
<td>53.71%</td>
</tr>
<tr>
<td>CVX</td>
<td>Chevron Inc.</td>
<td>88.63%</td>
<td>48.43%</td>
<td>77.17%</td>
<td>90.01%</td>
<td>70.49%</td>
<td>54.29%</td>
</tr>
<tr>
<td>COP</td>
<td>Conoco Phillips</td>
<td>20.78%</td>
<td>8.68%</td>
<td>15.11%</td>
<td>7.45%</td>
<td>11.70%</td>
<td>10.22%</td>
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<td>CenterPoint Energy, Inc.</td>
<td>54.30%</td>
<td>18.40%</td>
<td>20.55%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
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<td>0.00%</td>
<td>0.47%</td>
<td>1.57%</td>
<td>0.22%</td>
<td>1.11%</td>
<td>0.89%</td>
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<tr>
<td>MEAN</td>
<td></td>
<td>52.03%</td>
<td>20.93%</td>
<td>33.35%</td>
<td>28.19%</td>
<td>29.37%</td>
<td>23.82%</td>
</tr>
</tbody>
</table>

Table 2 details the results of the LIFO reserve as a percentage of inventory. LIFO reserve as a percentage of inventory is computed by dividing the dollar amount of the LIFO reserve by the reported dollar amount of inventory. LIFO reserve as a percentage of inventory specifies the stage of accounting inventory distortion. Exxon Mobile has the greatest LIFO reserve to inventory percentage in 2021 and consequently the largest accounting inventory distortion.
Delek US Holdings, Inc. has the least in LIFO reserve to inventory percentage during the past three years and thus the slightest accounting inventory distortion. The average percentage for all five petroleum companies are also shown in the table. A careful inspection exposes that the average LIFO reserve to inventory percentage increased dramatically from 2020 to 2021 (20.93% average in 2020 up to an average of 52.03% in 2021).

Table 3. LIFO Reserve as a Percentage of Net Sales

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>XOM</td>
<td>Exxon Mobile</td>
<td>21.81%</td>
<td>9.76%</td>
<td>12.30%</td>
<td>9.48%</td>
<td>13.83%</td>
<td>9.51%</td>
</tr>
<tr>
<td>CVX</td>
<td>Chevron Inc.</td>
<td>8.43%</td>
<td>6.25%</td>
<td>7.55%</td>
<td>7.98%</td>
<td>9.90%</td>
<td>9.61%</td>
</tr>
<tr>
<td>COP</td>
<td>Conoco Phillips</td>
<td>1.20%</td>
<td>0.82%</td>
<td>0.68%</td>
<td>0.32%</td>
<td>0.75%</td>
<td>0.76%</td>
</tr>
<tr>
<td>CNP</td>
<td>CenterPoint Energy, Inc.</td>
<td>1.82%</td>
<td>1.62%</td>
<td>1.75%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
</tr>
<tr>
<td>DK</td>
<td>Delek US Holdings, Inc.</td>
<td>0.00%</td>
<td>-3.43%</td>
<td>1.55%</td>
<td>0.17%</td>
<td>1.76%</td>
<td>2.58%</td>
</tr>
<tr>
<td>MEAN</td>
<td></td>
<td>6.65%</td>
<td>3.00%</td>
<td>4.77%</td>
<td>3.59%</td>
<td>5.25%</td>
<td>4.49%</td>
</tr>
</tbody>
</table>

Table 3 reveals the products of LIFO reserve as a percentage of net sales. LIFO reserve as a percentage of net sales is calculated as the overall dollar amount of the LIFO reserve divided by the dollar amount of the net sales, which again shows the amount of accounting distortion. Exxon Mobile is revealed to have the highest percentage of LIFO reserve to net sales in the majority of the years, with a large increase from 2020 (9.76%) to 2021 (21.81%).

Table 4. LIFO Inventory Distortion Percentage

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Exxon Mobile</td>
<td>174.55%</td>
<td>128.65%</td>
<td>152.35%</td>
<td>143.25%</td>
<td>163.56%</td>
<td>153.71%</td>
</tr>
<tr>
<td>Chevron Inc.</td>
<td>188.63%</td>
<td>148.43%</td>
<td>177.17%</td>
<td>190.01%</td>
<td>170.49%</td>
<td>154.29%</td>
</tr>
<tr>
<td>Conoco Phillips</td>
<td>120.78%</td>
<td>108.68%</td>
<td>115.11%</td>
<td>107.45%</td>
<td>111.70%</td>
<td>110.22%</td>
</tr>
<tr>
<td>CenterPoint Energy, Inc.</td>
<td>119.69%</td>
<td>118.40%</td>
<td>120.55%</td>
<td>100.00%</td>
<td>100.00%</td>
<td>100.00%</td>
</tr>
<tr>
<td>Delek US Holdings, Inc.</td>
<td>100.00%</td>
<td>100.47%</td>
<td>101.57%</td>
<td>100.22%</td>
<td>101.11%</td>
<td>100.89%</td>
</tr>
<tr>
<td>MEAN</td>
<td>140.73%</td>
<td>120.93%</td>
<td>133.35%</td>
<td>128.19%</td>
<td>129.37%</td>
<td>123.82%</td>
</tr>
</tbody>
</table>

Table 4 to 9 provides us further understanding into liquidity measures. Table 4 shows the LIFO inventory distortion percentage. LIFO inventory distortion percentage can be used to evaluate the inventory valued under LIFO with the inventory valued utilizing current cost and measures that balance sheet accounting distortion of LIFO. The year 2021 has an average inventory distortion percentage of 140.73%, which is up significantly from the inventory distortion percentage in 2020 (120.93%).
Table 5. Inventory Turnover Distortion Percentage

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>Exxon Mobile</td>
<td>-61.78%</td>
<td>-45.62%</td>
<td>-54.87%</td>
<td>-58.62%</td>
<td>-68.45%</td>
<td>-47.53%</td>
</tr>
<tr>
<td>Chevron Inc.</td>
<td>-80.04%</td>
<td>-71.59%</td>
<td>-93.90%</td>
<td>-90.17%</td>
<td>-70.12%</td>
<td>-63.68%</td>
</tr>
<tr>
<td>Conoco Phillips</td>
<td>-16.88%</td>
<td>-12.96%</td>
<td>-12.70%</td>
<td>-10.19%</td>
<td>-12.01%</td>
<td>-6.06%</td>
</tr>
<tr>
<td>CenterPoint Energy, Inc.</td>
<td>-24.09%</td>
<td>-24.34%</td>
<td>-15.94%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Delek US Holdings, Inc.</td>
<td>-0.18%</td>
<td>-1.14%</td>
<td>-1.18%</td>
<td>-0.72%</td>
<td>-1.18%</td>
<td>-0.60%</td>
</tr>
<tr>
<td>MEAN</td>
<td>-36.59%</td>
<td>-31.13%</td>
<td>-35.72%</td>
<td>-31.94%</td>
<td>-30.35%</td>
<td>-23.57%</td>
</tr>
</tbody>
</table>

Table 5 displays the accounting distortion in inventory turnover ratio. It is computed as the percentage change between the adjusted inventory turnover ratio and the reported inventory turnover ratio. Chevron Inc. has the utmost accounting distortion in the inventory turnover ratio numbers in the majority of the six years reported.

Table 6. Gross Profit Distortion Percentage

<table>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Exxon Mobile</td>
<td>-27.89%</td>
<td>-10.80%</td>
<td>-14.02%</td>
<td>-10.48%</td>
<td>-16.05%</td>
<td>-10.51%</td>
</tr>
<tr>
<td>Chevron Inc.</td>
<td>-9.21%</td>
<td>-6.67%</td>
<td>-8.17%</td>
<td>-8.67%</td>
<td>-10.98%</td>
<td>-10.63%</td>
</tr>
<tr>
<td>Conoco Phillips</td>
<td>-0.85%</td>
<td>-0.83%</td>
<td>-0.68%</td>
<td>-0.32%</td>
<td>-0.75%</td>
<td>-0.76%</td>
</tr>
<tr>
<td>CenterPoint Energy, Inc.</td>
<td>-1.71%</td>
<td>-1.65%</td>
<td>-1.78%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Delek US Holdings, Inc.</td>
<td>0.00%</td>
<td>-3.31%</td>
<td>-1.58%</td>
<td>-0.17%</td>
<td>-1.79%</td>
<td>-2.65%</td>
</tr>
<tr>
<td>MEAN</td>
<td>-7.93%</td>
<td>-3.33%</td>
<td>-5.25%</td>
<td>-3.93%</td>
<td>-5.95%</td>
<td>-4.91%</td>
</tr>
</tbody>
</table>

Table 6 reports gross profit distortion. Gross profit distortion is the percentage change between the adjusted gross profit and the reported gross profit. Exxon Mobile was discovered to have the most gross profit distortion in the majority of the six years. On average, the gross profit distortion percentage of -7.93% in the year 2021 more than doubled as compared to the gross profit distortion percentage in 2020 (-3.33%).

Table 7. Working Capital Distortion Percentage

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</thead>
<tbody>
<tr>
<td>Exxon Mobile</td>
<td>84.79%</td>
<td>-88.96%</td>
<td>-228.94%</td>
<td>-849.74%</td>
<td>6625.77%</td>
<td>431.31%</td>
</tr>
<tr>
<td>Chevron Inc.</td>
<td>44.58%</td>
<td>41.38%</td>
<td>71.50%</td>
<td>42.84%</td>
<td>82.71%</td>
<td>379.12%</td>
</tr>
</tbody>
</table>
Table 7 shows the working capital distortion. The working capital distortion is computed as the percentage change between the adjusted working capital and reported working capital. Exxon Mobile had the most working capital distortion in 2021, followed by Chevron Inc.

Table 8. Current Ratio Distortion Percentage

<table>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Exxon Mobile</td>
<td>65.56%</td>
<td>64.90%</td>
<td>71.13%</td>
<td>53.86%</td>
<td>76.08%</td>
<td>73.48%</td>
</tr>
<tr>
<td>Chevron Inc.</td>
<td>25.82%</td>
<td>18.56%</td>
<td>21.06%</td>
<td>27.89%</td>
<td>19.25%</td>
<td>25.47%</td>
</tr>
<tr>
<td>Conoco Phillips</td>
<td>7.88%</td>
<td>3.65%</td>
<td>4.93%</td>
<td>3.01%</td>
<td>4.53%</td>
<td>6.93%</td>
</tr>
<tr>
<td>CenterPoint Energy, Inc.</td>
<td>0.47%</td>
<td>0.58%</td>
<td>0.51%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Delek US Holdings, Inc.</td>
<td>0.00%</td>
<td>0.01%</td>
<td>0.03%</td>
<td>0.00%</td>
<td>0.02%</td>
<td>0.01%</td>
</tr>
<tr>
<td>MEAN</td>
<td>19.95%</td>
<td>17.54%</td>
<td>19.53%</td>
<td>16.95%</td>
<td>19.98%</td>
<td>21.18%</td>
</tr>
</tbody>
</table>

Table 8 reports the current ratio distortion. The current ratio distortion is computed as the percentage difference between the adjusted current ratio and reported current ratio. Exxon Mobile was discovered to have the greatest current ratio distortion in the majority of the six years.

Discussion

There has been much discussion of repealing LIFO. With the recent advance in oil prices and double-digit inflation, the boosted tax benefits are only compounding the discussion. “Repealing the LIFO option now would efficiently raise substantial revenue while reducing tax subsidies for fossil fuels” (Matheson & Brosy, 2022). The disallowance of the use of LIFO for tax purposes would result in a large tax bill for many of the companies that use the LIFO inventory method. For example, the LIFO reserve for Exxon Mobil (see Table 1) was $14 billion in 2021, up from $5.4 billion in 2020. Applying a 21% marginal tax rate would increase Exxon Mobil’s 2021 tax by almost $3 billion if LIFO were to be repealed.

Proponents of LIFO have argued that it results in a better match of revenues and expenses (Spiceland et al., 2022). Under LIFO, sales reflect the most recent selling prices and cost of goods sold includes the costs of the most recent purchases. This does, mean, however, that inventory costs in the balance sheet with LIFO are generally out-of-date because they reflect older inventory transactions. During periods of inflation and inventory quantities declining during the same period, out-of-date inventory will get liquidated and costs of goods will include noncurrent (lower) costs with current selling prices. This occurrence is known as LIFO liquidation (Yeo and Yeo, 2022).

Due to supply chain shortages, coupled with record high inflation, it is anticipated that oil and gas companies will experience LIFO liquidations, resulting in higher reported net incomes. These paper profits, or “phantom income” caused by including out-of-date, lower inventory costs in the costs of goods sold is a big potential issue in the 2022
tax year (and beyond) for oil and gas companies that have been utilizing the LIFO method (Yeo and Yeo, 2022).

Conclusion

Our study provides evidence that using LIFO inventory valuation does produce a material accounting distortion. The distortion itself is on the conservative side of accounting, understating the liquidity measures, working capital and the working capital ratios. In addition, the effects on the profitability ratios are indiscernible. This study also supports the validity of LIFO to relay cash flows and to perform some ratio analysis.

The issues with supply chain and inflation are worth noting. The United States is experiencing historical inflation, that coupled with the supply chain matters, could result in LIFO liquidations.

We believe the findings of our research have implications for decision makers due to these issues. It offers the ability to demonstrate to instructors and financial statement analysts the impact LIFO has on financial ratios.

The time frame posed a limitation to this study, due mainly to the fact that at the end of the time period was a time where oil prices were falling. In the current year, the prices have risen sharply and the supply chain issues are ongoing, creating a different challenge altogether.

Future research should include the current year with previous years to do comparative analysis on past inflation rate and supply chain to the current year inflation and supply chain challenges.

References


Infusing Entrepreneurship On Technical And Vocational Education And Training (TVET) College’s Curriculum

B.T. Garnede, University of Zululand, South Africa

ABSTRACT

Entrepreneurship education has become important for students who wish to pursue career in the field of Business and entrepreneurship. The phenomenon to globalisation that is sweeping the world is threatening to swallow up weak economies and small entrepreneurs.

According to (Schumpeter, 1934; Baumol, 1996; Mair & Marti, 2009), entrepreneurial activities promote rapid economic growth in various countries around the globe and create several jobs for people. National governments globally have placed significant focus on providing diverse support to lure more potential entrepreneurs into the production and manufacturing of goods and services, which can increase the Gross Domestic Product of every country, while these entrepreneurs’ standards of living improved (Van Stel & Storey, 2002). In most countries, due to dynamism of the world economy: as portrayed in literature showing rising unemployment levels as well as low rate of job creation. The slow economic recovery from the recent pandemic has revived the focus on entrepreneurial activity to create economic growth.

This study will use quantitative method to collect data from respondents in TVET Colleges. These participants acquire entrepreneurial skills from TVET College and are potential employees of the labour market. The aim of entrepreneur education is to produce students who will meet the demands of the labour market and create employment opportunities; to improve and develop students’ life skills; cognitive, interpersonal, and psychomotor skills. Gatawa (1999) points out that curriculum should be able to produce skilled manpower needed to produce goods and services.

Hence, curriculum should be designed to meet the needs of individuals and those of their countries as well. It is speculated that most people who has graduated will make a living by being employed in corporate industry because they lack entrepreneurial skills, as their skills and interests are so inclined. It is important for the curriculum planner to give serious attention to what students should learn, to realise the aspirations of all stakeholders and to develop entrepreneurship skills (EMS, 2001).

Keywords: Entrepreneurship, infusing, Technical, Misconception and Training.
Creative Problem Solving In Children With Reading Disabilities

John McNamara, Brock University, Canada
Michael McNamara, Sheridan College, Canada

ABSTRACT

Growing up creative is an important idea in today’s classrooms. As education seeks to prepare children for their futures, it is important that the system considers traditional as well as non-traditional pathways. Children in this study demonstrated phonological processing profiles that deemed them at-risk for reading disabilities. In general, children with learning disabilities struggle within traditional learning models. The Matthew effect is a consistent effect where struggling readers tend to fall further behind their non-learning disabled peers as they progress through their school years. For several decades researchers have attempted to develop and study reading-based interventions aimed at reducing the Matthew effect. Although such interventions have produced moderate gains in reading, they have failed to eliminate the effect. The current study attempted to explore a non-traditional learning pathway that focused on strengths. In business, the arts, and several non-traditional career endeavors there are numerous examples of individuals with learning disabilities who have reached significant levels of success. It is interesting to note, that almost all of their cited examples have succeeded in fields that rely on innovation, creativity, and “outside the box” thinking. The success of these individuals is thought to be associated with the notion that they are using a type of neurological processing that is not otherwise used in academic tasks. Individuals with learning disabilities, a presumed left-side neurological processing problem, process information with the right side of the brain – even with tasks that should be processed with the left side (i.e. language). In over-using their right hemisphere it is hypothesized that individuals with learning disabilities have well-developed right hemispheres and as such, have strengths associated with this type of processing such as innovation and creativity. In this way, it can be hypothesized that individuals with learning disabilities may be succeeding in specific ventures because of their dyslexic advantage. Their key message is that brain processing associated with learning disabilities is not simply a barrier to learning; rather it is a reflection of an entirely different pattern of brain organization and information processing—one that predisposes a person to important abilities. The current study lends support to the notion that children at-risk for reading disabilities may be particularly primed to succeed in areas that call on creativity and creative thinking.

Keywords: Learning Disabilities, Creativity, Children
Comparing Student Cognitive Engagement In Traditional And Active Learning Pedagogies Using Electrodermal Wristband Technology

Anastassis Kozanitis, Université du Québec à Montréal, Canada

ABSTRACT

A growing number of instructors are turning towards active learning teaching methods. These teaching methods aim, among other things, the development of higher order cognitive skills necessary for the performance of complex tasks as well as the development of professional skills. These teaching methods, which rely on inquiry-based learning, require a strong commitment from the student (Khan and O’Rourke, 2004). In a school context, this commitment is often referred to as student engagement. Fredericks et al., 2004 have suggested considering three aspects for defining the concept of engagement: behavioral, emotional and cognitive. For the past twenty years, most of the scientific literature has looked at behavioral and emotional engagement (Hutchins, 2015; Kuh, 2003), whereas researchers are only recently interested in cognitive engagement, and its influence on the learning process for undergraduate students. Also, most available research has focused on lower-level cognitive skills (memorization, comprehension, application) and on instructor-centered teaching methods such as lecturing (Blumenfeld et al., 2006).

Many undergraduate programs have introduced a competency-based curriculum, where the development of higher-level cognitive skills (analyze, evaluate, create) becomes crucial for solving complex problems (Zimmerman, 2013). Students are prompted to mobilize these higher-order cognitive processes when asked to complete complex tasks, that have a high degree of unfamiliarity, uncertainty, and may be resolved in various ways. Such a teaching environment would tend to arouse a high cognitive engagement of the student which, in turn, promotes the mobilization or the development of higher cognitive processes (Stolk and Harari, 2014). High cognitive engagement is a “serious emotional and cognitive investment in learning, using a high level mental process (such as analysis, assessment and creation) to enhance understanding, solve complex problems or build new knowledge” (Canadian Education Association, 2009, p.7). It is however difficult to measure using more traditional methods such as questionnaires and interviews. This is where available technologies, such as electrodermal wristbands, can provide useful data and confirm such hypothesis.

Participants agreed to wear the E4 Empatica bracelet allowing to measure electrodermal activity (EDA) in real time during class periods. Data was collected between week 6 and week 11 of the winter semester for 7 groups (4 active learning, 3 traditional lecturing). Results show that EDA levels were generally higher for students in the active learning groups, although some students in traditional lecture groups had similar EDA levels as the prior. This result suggests that student cognitive engagement does not only vary according to teaching methods, but individual characteristics, such as interest in subject matter, may also have a role.
Shifts In Security Analyst Risk Pricing Behavior During A Pandemic

Mike Cudd, Mississippi College
Marcelo Eduardo, Mississippi College
Chris Smith, Mississippi College

ABSTRACT

This paper submits that a material increase in uncertainty in security markets is accompanied by a shift by market analysts toward placing greater emphasis on general market factors, and consequently, lesser emphasis on idiosyncratic risk factors in the analysis of individual securities. The pattern is supported by a series of behavioral motives including the avoidance of penalties incurred for unfavorable outlier valuations, increased analysis complexity, and cost-efficiency considerations, all three of which are enhanced in a considerably more uncertain economic and market environment. A byproduct of the shift in analyst behavior is increased correlation among security valuations and prices, and therefore diminished benefits of diversification. The hypothesis is tested by examining the patterns of security returns before and after the onset of the COVID-19 crisis in early 2020. Upon the onset of the COVID-19 crisis, we observe a significant increase in the proportion of security returns (R-Square) explained by market factors. The findings are consistent with the hypothesized behavioral explanations.

INTRODUCTION – THE COVID-19 OUTBREAK AND ECONOMIC TURMOIL

The onset and rapid global expansion of COVID-19 infections in 2020 shocked the U.S. and world economies and financial markets. First reported by Chinese authorities to the World Health Organization on December 31, 2019, as a flu-like virus originating in Wuhan City, Hubei province, China, the virus quickly spread to other parts of the world. The first diagnosed case of the virus in the U.S. is reported in the state of Washington on January 21, 2020, for a man who had traveled to Wuhan. The WHO declares a global health emergency on January 30, 2020. The virus is officially designated COVID-19 by the WHO on February 11, 2020. The U.S. President declares a national emergency on March 13, 2020, and by March 17, 2020, the virus has spread to all 50 U.S. states. The virus has since rapidly expanded to (as of this writing) nearly eighteen million infections and over 700,000 deaths world-wide, with the largest concentration of infections and deaths centered in the U.S.1

Along with the virus outbreak, the economic and market impact has been equally severe. The U.S. unemployment rate rose from 3.5% in February to 14.6% in April, with a decline of 25 million people employed and another 8 million exiting the labor force. Real GDP fell at a roughly annualized rate of 38% in the second quarter. The DJIA and SP500 plummeted by more than 11% in the last week of February, 2020, with the DJIA and SP500 entering correction territory on February 12 and February 19, respectively. Although equity markets have generally risen during 2020 since that epic drop.2 The chaos in terms of the outlook for the economy and financial markets has left security analysts facing unprecedented uncertainty in the analysis of equity securities.

We examine the general hypothesis that amidst this greater uncertainty, security analysts may shift their risk emphasis to broader market risk factors and away from idiosyncratic risk factors. The consequence of this behavior could be greater alignment of security price movements and diminished diversification benefits. The remainder of the paper provides a discussion of the relevant behavioral literature, the sample, methodology, analysis of results, and implications of the findings.

BEHAVIORAL LITERATURE

While this study does not delve into identifying and isolating the specific biases that lead to the observed change in security price behavior with the onset of the pandemic, it is appropriate to offer an overview of the individual biases that may contribute to the observed pattern.

Avoidance of Outlier Valuations

An initial motive for security analysts to reduce the emphasis on idiosyncratic (company-specific) risk and increase the emphasis on market risk in the presence of increased economic and market uncertainty, may reflect an enhanced effort to avoid outlier valuations and their corresponding penalties. Analysts are aware that in the presence of greater economic and market uncertainty, more extreme valuations are possible, and the more extreme the valuation from that of peers, the greater the potential damage to the security analyst’s reputation and standing. One method of avoiding extreme outliers and producing valuations more consistent with those of peers may be to shift the emphasis in valuations to broader market variables that all other analysts incorporate, which could be viewed as a de nova form of trend-chasing or mimicking (Baker and Ricciardi, 2014). Broad economic and market forecasts are accessible from a variety of external sources and are more likely to be similarly interpreted by analysts, while conversely, idiosyncratic risk assessments are more likely to be unique and vary among security analysts.

Broader reviews of insights provided by behavioral finance studies are available (Thaler, 2016; Nigam, et al, 2018). Beyond the financial environment, behavioral studies support the effort by decision-makers to avoid uniquely adverse decision performance (Hellwig, 1980; Chen et al, 2020) and the accompanying damage to reputation (Scharfstein and Stein, 1990; Palley, 1995; and Morck et al; 1989).

Increased Valuation Complexity

Another motive to reduce emphasis on idiosyncratic factors in stock valuations may be driven by the increased decision complexity in more chaotic economies. There is little question that in the presence of greater economic chaos, the task of security valuation becomes more complex. There is evidence that the ability of financial analysts to incorporate specific information in their forecasts is diminished in the presence of more complex information (Plumlee, 2003). The problem may be further compounded by the inaccuracy in CFO predictions of stock returns in less chaotic environments (Ben-David, et al, 2013). In fact, the use of multipliers in security analysis may simply reflect the inability of investors to apply more complex methods of analysis (Odean, 2007).

There are a considerable number of biases among investors driven by psychological and sociological forces that may impact their behavior (Cronqvist and Siegel, 2014). One thread suggests that increased analysis complexity may be enhanced by biases in the willingness of analysts to vacate an initial valuation (Magro, 2006; Baker and Ricciardi, 2014). More recently, neuroscience offers an array of neural and cognitive origins that supports investor behavior beyond the constructs of efficient markets (Sahi, 2012; Frydman and Camerer, 2016). Beyond the realm of security analysis, there is evidence that as the complexity of civil suits increase, jury awards become more unpredictable (Horowitz et al, 2001; Horowitz et al, 1996), and cognitive errors also increase in general with greater decision complexity (Sung et al, 2009). Increased tax complexity also results in greater investment errors (Rupert et al, 2003; Boylan and Frischmann, 2006).

Economies of Heuristic Approaches to Valuation

Yet another motive suggests that with increased decision complexity, simpler heuristic methods of analysis may be favored as being more cost-efficient. This is not a new concept in corporate decision making (Barberis and Thaler, 2002). An increase in the complexity of a scenario may result in reverting to less complex methods of analysis (e.g., Payne, 1993; and Onken et al, 1985). Heuristics are observed to be a more cost-efficient approach to decision-making in some scenarios (Payne, 1993; and McGoun and Skubic, 2000), and an alternative method of extracting undisclosed information from observing the actions of peers (Banerjee, 1992; Leiberman and Asaba, 2006; Hirshleifer and Teoh, 2003; Fracassi, 2017). Mimicking the actions of peers is observed among institutional investors (Brown and Brooke, 1993).
Beyond the investment arena, the process of mimicking the actions of peers is reflected in merger and acquisition waves (Roll, 1986; Auster and Sirower, 2002), and the habit of international banks to copy the lending patterns of their competitors (Gwynne, 1986). More simplified approaches to decision analysis may also be favored when the supply of self-monitoring resources is limited (Fischer et al., 2008). Organizational decision makers are observed to place greater emphasis on quantitative analysis and lesser emphasis on judgment with increased decision complexity (Nutt, 1998). Even consumers are found to be more prone to employ a simpler processing strategy with higher levels of task complexity (Swait and Adamozicz, 2001), and fewer attributes are found to be employed in the evaluation of job applicants with increased numbers of applicants (Timmermans, 1993).

Consequently, in the presence of greater market and economic complexity, security analysts may restrict the use of idiosyncratic risk information due to their avoidance of outlier valuations and accompanying damage to reputation, the increased complexity of security analysis, and the greater labor-intensive nature and cost to acquire information.

SAMPLE

The hypothesized change in return patterns following the credit crisis is explored by examining a sample comprised of one hundred randomly selected stocks. Each stock is traded on the NYSE or the NASDAQ for the four years of weekly returns preceding the onset of the pandemic (weekly returns for 2016-2019), and for the first twenty-two weeks of returns in 2020 observed during the pandemic period. The sample excludes financial stocks since financial companies may hold portfolios of stocks and may disguise the effect of diversification. The sample is also restricted to companies with a minimal market capitalization of $2 billion (i.e., mid-cap stocks and above) and average weekly trading of at least 100,000 shares to ensure active investor participation. Ticker symbols of the individual stocks randomly selected for inclusion in the sample are displayed in Exhibit 1, and descriptive return characteristics are displayed in Table 2. There is no observed significant change in the level of sample returns observed between the pre-pandemic and pandemic periods defined in the study.

METHODOLOGY

The return patterns for one hundred randomly-selected stocks and subsets of portfolios are examined surrounding the onset of the credit crisis. First, regressions are performed before and after the credit crisis on each individual stock and portfolio using the Fama-French (1996) three-factor model to assess the effect of systematic influences on weekly return patterns surrounding the date of the inception of the credit crisis. The design permits assessment of the systematic influences prescribed by Fama and French (1996) preceding and following the onset of the Covid-19 pandemic. The model for the 209-week (i.e., four-year) period preceding the inception of the 2020 Covid-19 pandemic is defined as follows:

\[
E(r_{it}) = \beta_0[E(R_{M,t}) - R_{t}] + \beta_1E(SMB_t) + \beta_2E(HML_t) + R_{t}
\]  

Where

\(E(r_{it})\) is the expected weekly return on stock \(i\) for week \(t\),

\(R_{t}\) is the one-week Treasury Bill rate for week \(t\),

\(\beta_0, \beta_1, \beta_2\) and \(m_i\) are the coefficients of the return model for stock \(i\) for the 209-week period preceding the inception of the Covid-19 pandemic,

\(SMB_t\) is the difference between the return on a portfolio of small stocks and the return on a portfolio of big stocks in week \(t\),

\(HML_t\) is the difference between the return on a portfolio of high book-to-market stocks and the return on a portfolio of low book-to-market stocks.

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3 https://www.nyse.com/listings_directory/stock
4 https://www.nasdaq.com/market-activity/stocks/screener
5 While there are different points of acceleration in the virus beginning in 2020, the first case of the Covid-19 virus in Wuhan China is reported to the World Health Organization on December 31, 2019. Consequently, the onset of the virus for purposes of this study is defined as the first week of 2020.

Parameter values for the three-factor Fama-French (1996) model are obtained from the Kenneth French Data Library at: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html
of low book-to-market stocks in week $t$, and
\[ R_{M,t} \] is the return on the market portfolio $M$ for week $t$.

The above three-factor regression model is applied individually to each of the stocks and portfolios displayed in Exhibit 1, producing a unique R-square value for each for each stock for the pre-pandemic period. The R-square value represents the proportion of the security (portfolio) returns for that stock explained by systematic market factors during the pre-pandemic period.

The same regression procedure is followed for each stock for the 22-week pandemic period beginning with the first week of 2020. An example of the individual regression results for one stock (AEE; Ameren Corporation) is displayed in Table 3.

R-square values before and after the onset of the Covid-19 pandemic are then compared for the significance of the change in the means. Support for this study’s hypothesis is evidenced by a significant increase in the R-square values with the onset of the Covid-19 pandemic.

RESULTS AND ANALYSIS

R-square values before and after the onset of the pandemic are displayed in Table 4. Findings show a significant increase in model R-square values for the individual stocks with the onset of the Covid-19 pandemic. The findings are consistent with the hypothesis that with the onset of the Covid-19 pandemic, security analysts increased their relative emphasis on systematic market factors in the valuation process. A consequence of the shift in emphasis is that analyst valuations and buy-sell recommendations for each stock more likely trend in concert with the predicted movement of the systematic market variables. The greater congruence of buy-sell recommendations among analysts likely produces stock returns that are more highly correlated in movement, which also may reduce the benefits of diversification. Practitioner support for his pattern is provided in Morningstar (Carey and Lauricella, 2020). It is noteworthy that the findings of the current study are consistent with those observed for the 2007-2009 Credit Crisis, an earlier period of economic and market chaos, which observed an increased influence of systematic market factors on stock returns with the onset of the Credit Crisis (Cudd et al, 2014).

Prior studies observe the diversification myth pattern of increased return correlations in down markets to be more pronounced among small stocks (Ang and Chen, 2002), although small-cap stocks are omitted in the current study. Smaller companies offer greater challenges to security analysts associated with the lack of extensive historical market data, lack of geographic and product diversification, and greater reliance on idiosyncratic risk factors for the analysis and valuation. In addition, the smaller amounts of funds at stake with small companies may not justify expending greater resources in their evaluations. This may fuel a reversion to more simplified approaches to security analysis with small stocks due to the dimensions of complexity, and a commensurate shift to greater emphasis on systematic factors and reduced emphasis on idiosyncratic risk factors. The product of such a shift in emphasis would be similar valuations by analysts and increased correlations in returns, although not necessarily only in down markets as suggested by the diversification myth.

CONCLUSIONS

The onset of the Covid-19 pandemic in early 2020 accompanied by increased chaos in the economy and its outlook greatly increased the complexity of security analysis. Behavioral literature suggests that in the presence of increased complexity, decision-makers may revert to simpler decision heuristics associated with cost efficiencies and the avoidance of penalties due to unfavorable outlier valuations.

We hypothesize that in the midst of enhanced economic and market chaos, security analysts may revert to a de nova form of mimicking by increasing their relative emphasis on broader market factors and consequently reducing their relative emphasis on idiosyncratic risk factors. General market and industry factor outlooks are available from multiple independent sources, which are more likely to receive a similar interpretation by analysts, and thus result in greater congruence in terms of the effect of systematic factors on stock valuations. Conversely, idiosyncratic risk factors are more likely to be independently analyzed and subject to greater variations in interpretation by security analysts. The shift to greater emphasis on general market factors should produce valuations that are less dispersed.
among security analysts, resulting in greater correlation in stock price movements. The increase in stock correlations is confirmed by industry source Morningstar noting that during the pandemic US stock funds demonstrate minimal differentiation in performance with the exception of superior performance by the defensive sector, while a precipitous market drop in the past would have been typically accompanied by variations in declines across all economic sectors (Carey and Lauricella, 2020).

In testing this hypothesis, we examine the patterns of returns surrounding the onset of the Covid-19 crisis in 2020 for a random sample of stocks. With the onset of the pandemic, we observe a significant increase in the proportion of security and portfolio returns explained by general market factors for individual stocks. The findings support the hypothesized shift in risk emphasis in security analyst valuation techniques, and are consistent with the submitted behavioral explanations related to guarding security analyst reputation, increased decision complexity, and cost-efficiency in analysis.

It is noteworthy to mention the conventional diversification myth, which addresses the consequences of increase equity correlations. Although the conventional diversification myth focuses on down markets and is thoroughly tested in the financial literature (e.g., Chua, Kritzman and Page, 2009; Jacquier and Marcus, 2011; Ang and Chen, 2002; Ang, Chen, and Yuhang, 2006; Falkenstein, 1996; Li, Miffre, Brooks and O’Sullivan, 2008; Van Royen, 2002; and Campbell, Koedjik, and Kofman, 2002), there is no consensus on the theoretical and behavioral foundations driving the pattern (Merton, 1987; Li, Miffre, Brooks, and O’Sullivan, 2008; Blume and Friend, 1975; and Tang and Shum, 2003).

Pertinent to the current study, however, a similar type of diversification myth effect is associated with massive shocks to the market, such as the Credit Crisis (Cudd et al, 2014) and the current Covid-19 pandemic. More importantly, the findings are consistent with a behavioral foundation for the pattern of increased equity return correlations.

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https://www.nyse.com/listings_directory/stock


Exhibit 1
Sample Companies (Ticker Symbols)
N=100

<table>
<thead>
<tr>
<th>AEE</th>
<th>CMD</th>
<th>DIS</th>
<th>ETH</th>
<th>IMO</th>
<th>LPSN</th>
<th>NP</th>
<th>PM</th>
<th>SNBR</th>
<th>TSN</th>
</tr>
</thead>
<tbody>
<tr>
<td>AKAM</td>
<td>CNXN</td>
<td>DISH</td>
<td>EXC</td>
<td>JBT</td>
<td>LTRX</td>
<td>NSP</td>
<td>PSA</td>
<td>SNPS</td>
<td>TWTR</td>
</tr>
<tr>
<td>AKZOY</td>
<td>COCP</td>
<td>DKS</td>
<td>EXR</td>
<td>K</td>
<td>LVMUY</td>
<td>NVMI</td>
<td>PVH</td>
<td>SPLK</td>
<td>TYL</td>
</tr>
<tr>
<td>AMX</td>
<td>COKE</td>
<td>DLR</td>
<td>FFIV</td>
<td>KEX</td>
<td>MNRO</td>
<td>NVS</td>
<td>QLYS</td>
<td>SSS</td>
<td>UNP</td>
</tr>
<tr>
<td>ASGN</td>
<td>CSCO</td>
<td>EA</td>
<td>GEF</td>
<td>LAD</td>
<td>MNTX</td>
<td>PANW</td>
<td>RBCN</td>
<td>SWK</td>
<td>UTI</td>
</tr>
<tr>
<td>ATNI</td>
<td>CSOD</td>
<td>EHC</td>
<td>GEL</td>
<td>LAKE</td>
<td>MRCY</td>
<td>PCG</td>
<td>RCL</td>
<td>TECK</td>
<td>VEEV</td>
</tr>
<tr>
<td>CBRE</td>
<td>CTAS</td>
<td>ENCL</td>
<td>HNRG</td>
<td>LDL</td>
<td>NBIX</td>
<td>PCH</td>
<td>RL</td>
<td>TER</td>
<td>VMW</td>
</tr>
<tr>
<td>CE</td>
<td>CTS</td>
<td>EQIX</td>
<td>HOLX</td>
<td>LJPC</td>
<td>NBR</td>
<td>PCRFY</td>
<td>SB</td>
<td>TEX</td>
<td>VTVT</td>
</tr>
<tr>
<td>CHMA</td>
<td>DD</td>
<td>EROS</td>
<td>HQY</td>
<td>LNN</td>
<td>NI</td>
<td>PHM</td>
<td>SGU</td>
<td>TLK</td>
<td>XONE</td>
</tr>
<tr>
<td>CMCSA</td>
<td>DECK</td>
<td>ESI</td>
<td>IMMU</td>
<td>LPSN</td>
<td>NL</td>
<td>PKG</td>
<td>SKM</td>
<td>TRU</td>
<td>YNDX</td>
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</table>
Table 2
Sample Characteristics

<table>
<thead>
<tr>
<th>Mean / Sample Standard Deviation</th>
<th>N=100</th>
</tr>
</thead>
</table>

Panel A
Fama-French 3-Factor Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pre-Pandemic&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Pandemic&lt;sup&gt;b&lt;/sup&gt;</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mkt-RF</td>
<td>0.0221 (0.2620)</td>
<td>-2.8632 (2.7424)</td>
<td>-10.5189*</td>
</tr>
<tr>
<td>SMB</td>
<td>0.0004 (0.0074)</td>
<td>-0.0002 (0.0063)</td>
<td>-0.6049</td>
</tr>
<tr>
<td>HML</td>
<td>0.0048 (0.0079)</td>
<td>0.0050 (0.0151)</td>
<td>-0.1197</td>
</tr>
<tr>
<td>RF</td>
<td>0.0096 (0.0039)</td>
<td>-0.0036 (0.0045)</td>
<td>-20.3205*</td>
</tr>
</tbody>
</table>

Panel B
Sample Variables

| Stock Return | 0.0036 (0.0036) | 0.0047 (0.0124) | -0.8890 |

*P<.01
<sup>a</sup>Pre-pandemic period (209 weeks): 2016 week 1, through 2019 week 52.
<sup>b</sup>Pandemic period (22 weeks): 2020 week 1, through 2020 week 22.
Table 3
Example of Three-Factor Model Regression Results for Single Company: AEE (Ameren Corporation)

<table>
<thead>
<tr>
<th>Coefficients</th>
<th>Mkt-RF</th>
<th>SMB</th>
<th>HML</th>
<th>RF</th>
<th>Intercept</th>
<th>S.E.</th>
<th>F-Value</th>
<th>R-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Pandemic Period(a)</td>
<td>-0.0570</td>
<td>-0.0011</td>
<td>-0.0050</td>
<td>0.0023</td>
<td>0.0036</td>
<td>0.0205</td>
<td>4.5600*</td>
<td>0.0827</td>
</tr>
<tr>
<td>Pandemic Period(b)</td>
<td>-0.4314</td>
<td>-0.0014</td>
<td>0.0172</td>
<td>-0.0054</td>
<td>0.0104</td>
<td>0.0715</td>
<td>1.9215</td>
<td>0.3113</td>
</tr>
</tbody>
</table>

**p<.01
\(a\)Pre-pandemic period (209 weeks): 2016 week 1, through 2019 week 52.
\(b\)Pandemic period (22 weeks): 2020 week 1, through 2020 week 22.
Table 4  
Portion of Stock Returns Explained by Fama-French Systematic Factors

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pre-Pandemic[^a]</th>
<th>Pandemic[^b]</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-Square of Regression Models</td>
<td>0.2398 (0.1312)</td>
<td>0.2752 (.0947)</td>
<td>2.2981*</td>
</tr>
</tbody>
</table>

[^a]: Pre-pandemic period (209 weeks): 2016 week 1, through 2019 week 52.  
[^b]: Pandemic period (22 weeks): 2020 week 1, through 2020 week 22.

**p<.01  
*p<.05
Managerial Ownership And Firm Performance In Jordan
Zyad Marashdeh, The Hashemite University, Jordan

ABSTRACT
Due to the separation of ownership and management, numerous studies have examined the relationship between managerial ownership and firm performance. Whereas shareholders are concerned with their profit, managers are interested in increasing their own interest. This might result in a conflict of interest between them. Many studies have been focused on the developed countries however, little studies have investigated this issue in developing countries specifically Jordan. This study examines the relationship between managerial ownership and firm performance in Jordan using a sample of 87 listed firms in Amman Stock Exchange from 2012 to 2020. Our results show a positive and significant relationship between managerial ownership and firm performance measured by ROA and ROE. Our results support the agency theory, which suggest that by aligning the interest between shareholders and managers this will result in decreasing agency costs. Therefore, the results and the implications of this study might have significant effect on policymakers and regulators in Jordan.
The Effects Of Disclosed Audit Quality Indicators On Bank Loan Officers' Judgement And Decisions
Joshua Nyantakyi, Virginia State University, USA
Nizar M. Alsharari, Jackson State University, USA

ABSTRACT
This paper aims to examine the effects of disclosed audit quality indicators on bank loan officers’ judgment. After the accounting scandals in companies such as Enron and WorldCom and the 2008 financial crisis in the U.S., the Public Company Accounting Oversight Board (PCAOB) has initiated actions toward modifying the audit report. One of these initiatives is the Audit Quality Indicators (AQIs) project which would require auditors to publicly disclose information on the quality of audits provided (PCAOB, 2015).

We used a 2 x 2 + control group between-subjects experimental design to examine the impact of disclosed AQIs on bank loan officers’ judgments and decisions. We found that bank loan officers have more confidence in the reliability of an audited financial statement disclosed with a positive AQI trend than those with a negative AQI trend. In turn, participants are more willing to grant loans to borrowers with positive AQI trends disclosed in the audit report than those with negative AQI trends and no AQIs. Furthermore, this study found an inverse relationship between disclosed AQIs, and interest premium charged. Results also suggest that a qualitative AQI supplementing a quantitative positive AQI trend further affects bank loan officers’ decisions. However, it has no further effect on bank loan officers’ decisions under a negative AQI trend.

Our empirical study demonstrated that bank loan officers effectively understand and utilize additional information (AQI information) disclosed to them in an audit report when making judgments and decisions. Specifically, those who receive an audit report with a disclosed positive AQI trend have more confidence in the reliability of audited financial statements than those provided with a disclosed negative AQI trend. In turn, bank loan officers who receive a disclosed positive AQI trend in an audit report are more likely than those who receive audit reports with disclosed negative AQI trend and no AQI information to grant a loan application. The findings of this study contribute to the PCAOB’s 2021 – 2023 strategic plan objective to effectively determine, develop, and communicate audit quality indicators.

Keywords: bank loan officers; audit quality; judgments and decisions; disclosure; audit quality indicator
Development Of A Teacher-Supporting Application To Streamline Lesson Plan Design For AI Education

Hong Bich Cu, Toyo University, Japan
Takayuki Fujimoto, Toyo University, Japan

ABSTRACT

The incredible evolution of Artificial Intelligence (AI) has impacted human society in various aspects. Thus, people need to have a fundamental knowledge of AI to use it safely and effectively. While the youth has been growing up with technologies, AI education for middle and high school students is still at its beginning stage. Also, it is challenging for middle and high school teachers to introduce a new perception of AI to their students, especially those without a programming background. Therefore, we propose an application to assist teachers with creating AI lesson plans and suggest a teaching method to help students relate AI knowledge and intelligent devices they use daily.

1. Introduction

1.1 The impacts of Artificial Intelligence (AI) on multiple facets of human life.

The miracle development of technology has digitalized the significant perspectives of our life, from working and studying to daily entertainment. Artificial Intelligence (AI) appeared as a breakthrough in technology, which even facilitates human life more remarkably. Thus, AI is believed to have an increasingly visible influence on human activities in society (Eguchi et al., 2021). We have been exploiting AI’s applications to continue to perform daily tasks, such as searching by Google, keeping in contact by emails, asking for directions, or having suggestions of music and movies. Our reliance on AI has become more noticeable since the COVID-19 pandemic broke out (Akgun and Greenhow, 2021). In the report published in 2021, Jeon et al. claimed that human utilization of AI has been rising during the pandemic, leading to AI’s worldwide effects on residents’ various aspects of lives. Such effects are expected to become more apparent in the future, especially when AI has led to social and economic transformation (Estevez et al., 2019). In addition, AI has become progressively universal, holding enormous potential for social and economic development. Meanwhile, it is possible to modulate our way of discovering, studying, communicating, and working (Goralski and Tan, 2020).

There has been a common idea that artificial intelligence will play a vital role in enhancing the development of the prospective society and flourishing AI economy (Wu et al., 2021). As a result, the exploitation of AI has become a crucial factor in the evolution of the digital economy (Khisamova et al., 2019). Indeed, while many of us are unconscious of its incredible impacts on our present society, AI is expected to gradually permeate every corner of human life in the future (Bekes and Galzina, 2022). Kamble and Shah (2018) also suggested that due to AI’s contribution to various categories over the last two decades, human skills in various areas can be replaced by AI machines in the near future. Undoubtedly, AI will have a remarkable and increasing influence on our modern society, leading to the redefinition of essential knowledge and skills that students require to live well and be productive at work (Dai et al., 2020). Therefore, early preparation is encouraged for AI’s impacts in the digital age of a rapidly developing economy (Bughin et al., 2017).

Besides the economy, AI has also been utilized in various aspects of education. Regarding higher education, Zawacki-Richter et al. (2019) revealed in their report that AI has been applied in both academic assistance for students and administrative support. Similarly, artificial intelligence has great potential in primary and secondary education. While AI-enhanced systems are still under development, they are believed to have significant applications in monitoring and evaluating students’ behaviors and learning outcomes. Furthermore, AI can be utilized in learning individualization
and adaptive assessment, providing students with assistance in elemental math (Bekeš and Galzina, 2022). Intelligent tutoring systems also support teachers and students with a personalized learning environment, which is an outstanding benefit of AI in education (Akgun and Greenhow, 2021). For example, Leaton Gray (2020) mentioned various intelligent learning platforms that are commonly used in English-speaking schools in his research. There are several programs, which support children with individualized learning solutions and encouraging activities inside classrooms, such as the “Education Perfect platform” or “Mathletics and Spellodrome” (Leaton Gray, 2020).

Undeniably, AI influences more aspects of human life apart from education, including the medical field, accounting problems, computer games, and transportation with traffic control. According to Nadikattu (2016), artificial intelligence plays a pivotal role in numerous industries, from information technology to marketing, cybersecurity, healthcare, or even art and military. More importantly, AI is now believed to be indispensable in developing a sustainable economy, which contributes to maintaining human well-being (Dai et al., 2020).

Another remarkable issue is AI’s apparent influences on manufacturing activities and the labor market, especially on repetitive jobs and people who cannot work with technology. Gosh, Chakraborty, and Law (2018) explained in their research that while AI replaces humans to do standardized and repetitive tasks and enhances productivity, it has displaced various jobs. Since artificial intelligence automates different work and even assists humans in decision-making, it has urged the workforce to adopt new responsibilities and different technical skills to work with AI-enhanced tools effectively (Sanusi et al., 2022). On the other hand, there are various positive effects on the labor market as well. Since dangerous and repetitive jobs are taken over by AI, manual laborers who used to do these jobs have to gain new skills. Hence, they can invest their capability in better and more advanced work, such as creativity (Nadikattu, 2016). Nevertheless, the nature of employment is changing with the rapid development of technologies. Workers tend to experience negative impacts caused by the fact that their previous jobs may be displaced. Also, the growing gap in computer skills can exclude employees from the labor market (UNESCO, 2021), and many of them may have to retrain new skills to adapt to a different working environment. This issue will lead to a new trend in the future labor market, in which workers are required to interact with intelligent devices competently.

1.2 Users’ insufficient understanding of their frequent interaction with AI in their daily life.

There is no guarantee that all users, mostly young people, can absolutely understand AI. The recent integration of artificial intelligence in people’s daily lives, including AI-enhanced devices and social network platforms, might not be recognized by youngsters, especially children. AI has started to influence children’s ways of living, playing, and learning. This phenomenon leads to the prospect of children becoming not simply “digital natives” but also “AI natives”, who are different from previous generations regarding connection with technology (Williams et al., 2019). The presence of artificial intelligence is conspicuous in children’s growing up, from the very popular virtual assistants (i.e. Siri, Google Assistant, or Alexa) to various applications in all fields of human life, including education, social media, entertainment, medical treatment, transportation, and robotics (Yang, 2022). Despite their increasingly constant interaction with AI-powered applications in both home and school, children are often not conscious of their interaction with AI systems or how these intelligence devices work. Children’s unawareness of AI’s appearance in their daily activities has led to a noticeable AI literacy gap (Zhou et al., 2020).

Therefore, users need to learn and understand AI, especially the youth. In the research work published in 2019, Williams et al. mentioned that researchers had to investigate safety and privacy issues related to children’s daily interaction with AI-enhanced tools, such as intelligent speakers and toys. They found that although children are enthusiastic about AI, they have inadequate assumptions about AI’s capability due to the lack of instruction on what this technology can do. However, it is challenging even for adult users to understand how AI works. Normal users also do not perceive that they interact with artificial intelligence so often, and algorithms implemented in common AI-enhanced platforms can be difficult for them to understand. Deficient knowledge about AI will possibly prevent users from utilizing AI rationally and effectively (Long and Magerko, 2020). Hence, AI literacy is essential for people to become critical users of AI technology. That is the reason why researchers in AI and education fields have to stimulate better learning programs to increase users’ AI knowledge, as well as integrate AI in K-12 education to provide young learners with a chance to see themselves as AI future producers (Zhou et al., 2020). Touretzky et al. (2019) also expressed a similar viewpoint that it is time to consider what should be included in AI education for the K-12 level. Introducing AI knowledge to users does not only guarantee that the public understands the technologies they are interacting with daily but also encourages students to become AI programmers or technology developers in
Wong et al. (2020) mentioned that another motivation to promote AI education for the young generation is AI’s unavoidable influence on their future, regardless of the pace of AI evolution. Thus, Wong and his colleagues recommended three main objectives for AI education to support students to live well and work effectively in the future. These goals are to provide students with (1) preparation for their life in an AI-powered society and changing labor market; (2) fundamental knowledge about technologies and inspiration for potential software developers or AI professionals; (3) training on how to apply AI ethically and safely in students’ future jobs, such as medicine, natural sciences, and finance. Similarly, Dai et al. (2020) also agreed that if the goal of education is to equip students with AI knowledge and essential technical skills so that they can meet the demand of the future labor market, it needs to include AI as an academic topic of the curriculum.

In short, due to AI’s increasing influence on society, it is essential to pay attention more to citizens’ AI literacy and AI skills gap crisis all over the world. One of the solutions to these issues is to promote equal opportunities for every user to access and learn about AI, especially early AI education for youngsters (Williams et al., 2019). In order to understand AI’s capability and limitations, usefulness, AI-related problems, and AI’s role in sustaining human well-being, every user needs to acquire fundamental AI knowledge and skills (UNESCO, 2022).

1.3 An overview of current AI education.

AI has been traditionally introduced in universities, both for undergraduate and post-graduate levels (Steinbauer et al., 2021). Various courses for future AI experts have been offered by universities as well (Wong et al., 2020). In addition, there have been lots of efforts to integrate AI literacy into the general education framework, which is known as the K-12 level in the majority of related work. Although this process is considered slower than informal AI education (which is privately organized and different from formal education at schools), it has achieved more attention recently. Governments, supporting organizations, and affiliated corporations have recognized that AI education should become a part of their national education systems at the K-12 level (Steinbauer et al., 2021). For example, Wu et al. (2021) described how AI content has been integrated into the grades 5-8 educational program, and how AI has been implemented in different subjects (such as STEM courses, Computer Science, or Music) at schools in the Pennsylvania Montour School District.

Despite these efforts, in many nations, the idea of teaching AI to middle and high school students is not popular yet. AI education for K-12 students is still in the nascent stage, which still has many challenges to overcome before being widely introduced to students (Wu et al., 2021). From students’ perspective, that learning AI concepts involves many other disciplines to understand and also becomes a challenge for students. AI education is different from traditional subjects, such as Math or Physics, but a field in that students need lots of prerequisite courses and programming knowledge. This is practical at the university level but difficult for K-12 students (Wu et al., 2021). In the report published in 2021, Peterson et al. revealed that regarding AI education in China, the AI curriculum is too difficult for young children. This idea is noted by local education consultants, claiming that students need fundamental background knowledge to learn about deep learning algorithms. Furthermore, those who find opportunities to study AI are affected by their previous impression of AI. High school students’ perceptions that make them uninterested in studying Computer Science, such as demanding multidisciplinary knowledge and computer-centered professions, also affect students’ motivation to study AI (Long and Magerko, 2020). Although the importance of the AI education curriculum has been recognized, only a trivial number of supporting tools have been developed to investigate and observe the degree of K-12 students’ readiness in learning AI (Dai et al., 2020).

Moreover, while research in AI education as a whole category has been developing remarkably, study on teachers’ perspectives that would directly orient teaching and learning activities remains limited (Sanusi et al., 2022). High school teachers encounter various obstacles in teaching the basics of AI to their students. Estevez et al. (2019) have pointed out two typical causes of teachers’ difficulties, including the lack of a consolidated teaching method and the requirement for multidisciplinary background knowledge. Additionally, the requisite knowledge and teaching skills K-12 teachers need are different from those of university instructors. Consequently, K-12 teachers will find it hard to directly apply teaching materials used at the university to introduce AI knowledge to their students (Wu et al., 2021). Therefore, I proposed an application that assists teachers to conduct adaptive teaching materials and pedagogical methodology regarding AI education at the middle and high school levels. This application recommends a new idea
of introducing AI concepts that teachers can use to arouse students’ interest, which encourages them to analyze AI-powered devices or gadgets they are using in their daily life.

2. An overview of our previous work

Our previous paper proposed the idea of how the application should operate in supporting middle/ high school teachers create their AI lesson plans. The main goal is to support middle/ high school teachers to create AI lesson content, which helps them introduce AI foundation knowledge to their students effectively. Instead of making students study AI complex concepts, we aim to make them feel that they are investigating real intelligent devices and software that they are using every day. The application has different functions to optimize the process of conducting teaching materials and improve lesson effectiveness, including (1) recommending AI-enhanced products corresponding to AI knowledge teachers want to introduce; (2) updating requirements of national education standards regarding AI curriculum; (3) integrate search engine to suggest reference resources to teachers to create lesson plans conveniently; and (4) allow teachers to have their social networking to share and co-design AI lesson plans. Main instructional strategies include four steps, starting from choosing AI-related products to begin an AI lesson, to introducing AI fundamental concepts, Ethics and social impacts of AI, and Using and developing AI. Nevertheless, there are some issues that we could not solve in our previous paper. First, the explanation of application usage in our previous work is not detailed enough for users to imagine how to exploit it to create AI lesson content (i.e., how the application suggests AI-powered products to teachers to illustrate AI lessons for middle/ high school students was not explained properly).

In this second paper, we would like to reveal the flowchart image to clarify how teachers can use our proposed application. Additionally, an illustration image of the application’s sample screen will be presented to explain how the application recommends AI-related products based on lesson content that teachers choose.

3. Purpose

Before presenting the main purposes of the proposed application, we would like to explain the particular terms or phrases we use in this paper. Although these terms are not specialized vocabulary for any specific field, they appear frequently in this paper with proper meaning, which might be different from their original definition.

**AI education for middle and high school students:** This idea includes introducing fundamental AI concepts and AI-related issues in society, hence middle and high school students can have a general understanding of the intelligent devices they are using. In other words, AI education raises students’ awareness of AI’s presence by giving them lessons and some activities to participate in. Details of concepts of the AI curriculum we would like to suggest to teachers and the difficulty level of lessons will be revealed later in this paper.

**Equal education opportunities:** The original concept of this phrase is clarified by MEXT (2006), which claimed that “people must be given equal opportunities to receive an education suited to their abilities and must not be subjected to discrimination in education on account of race, creed, sex, social status, economic position, or family origin.” Nevertheless, in this paper, we would like to limit obstacles preventing students from achieving AI education to financial difficulties only. By saying students need equal education opportunities to learn AI, we mean that regardless of economic status, all students can have equal access to AI knowledge, which should be integrated into the formal education programs at schools.

**AI lesson plans:** Although this term was one of the keywords in our previous paper, we did not define clearly how teachers design and use lesson plans. In this paper, an AI lesson plan is a framework for teachers to arrange which AI-related content they will introduce to students. An AI lesson plan also helps teachers to manage organized class activities and reasonable time allocation for each activity. In other words, a lesson plan reveals the teaching strategy and learning activities that a teacher prepares in advance.

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3.1 Promote equal opportunities to access AI education for middle/high school students.

The first purpose of this research is to contribute to providing middle and high school students with equal opportunities to learn about AI. Recently, there are several countries have integrated AI education into their formal curriculum. China and the United States are two examples of this tendency. In the report comparing the AI education between China and the United States, Peterson et al. (2021) declared that while both two countries have a large size of students, their attempt to apply AI curriculum in formal education is noteworthy. The United States has its first public high school focusing on artificial intelligence in Gwinnet County. The number of schools integrating Computer Science curricula in the US is rising. Meanwhile, since the Chinese education system is centralized, China has been implementing AI education at all levels more systematically. Especially, the AI curriculum is officially implemented at the high school level by the MOE. Chinese primary and secondary schools introducing AI basics in their curricula are rewarded by provincial education authorities. Despite these efforts, educational resources are not distributed equally. For example, not every school in China can provide students with AI education due to the lack of qualified educators, academic resources, and technology infrastructure. Unlike other subjects such as Math and English, AI education requires computational facilities. However, economic inequity in China has prevented schools in less developed areas from providing students with needed equipment. Furthermore, AI educators are distributed unequally, leading to a manpower shortage in numerous schools. Consequently, only a small number of schools located in the most developed cities, such as Shanghai and Beijing, are able to afford AI education with qualified technology facilities and experienced AI instructors (Wu et al., 2021). In addition, urban-rural separation in China is also believed to contribute to the unbalanced distribution of academic resources. While primary and secondary students in Beijing can experience robotics labs, their counterparts in poorer areas of China may not have such opportunities (Peterson et al., 2021).

Unbalanced economic condition among households in the same living region also leads to students’ unequal chances of accessing AI education. Recently, there have been various out-of-school learning programs or summer/winter camps for youngsters to access AI education. In other words, they are informal learning programs that students can enjoy outside their schools. Although there are free summer programs for learners offered by AL4ALL (ai-4-all.org), almost AI courses offered by institutions other than schools require a tuition fee. For example, all AI programs offered by Create & Learn cost a minimum of $109 for the one-month program (create-learn.us). Not every student can afford such extra classes to learn AI due to limited budgets for education that their families can handle. As a result, I believe that introducing AI to students at their schools can be one of the most effective methods to ensure equal learning opportunities for students regarding AI education. When proposing this application, our goals are to let students enjoy free AI education and minimize dependence on computational infrastructure regarding teaching and learning AI. Also, our proposed application is expected to recommend to teachers a different way of introducing AI concepts to middle and high school students. Technology teachers, who have undergone training programs to teach AI basics, can still handle AI introductory courses at middle and high schools. We hope this potential solution can alleviate the shortage of experienced AI educators, which has hindered various secondary schools from integrating AI into their regular curricula earlier.

3.2 The development stage of the proposed application

The second purpose of this paper is to present a clearer explanation of how the application operates, which was proposed in our previous paper mentioned in part 2. This is the second paper in our progress of developing an educational application, which emphasizes assisting teachers. One of the obstacles middle and high school teachers are facing in instructing AI knowledge is that they need a different teaching method than traditional lecturing. There are differences in AI education between the university and K-12 levels. AI curriculum for undergraduates concentrates on technical knowledge, such as algorithms behind AI systems (Steinbauer et al., 2021). Meanwhile, we believe that AI learning content for K-12 grades should be about providing students with a general understanding of AI, and how they can use AI-enhanced tools safely and effectively. In fact, many graduate and undergraduate students also found AI complicated and too discouraging for them to understand, even when AI has become familiar at the university level. As a result, excitement-boosting elements have been added to AI courses for graduates and undergraduates, which include gamification. For example, the classic game Pac-Man was applied by instructors at the University of California to teach an introductory AI course, which successfully raised the enrollment rate up to 69% (Wong et al., 2020). The same instructing method likely applies to middle and high school AI education. Estevez et al. (2019) agreed
that school curricula must reform traditional lecturing-centered classes into more interactive practical study environments. The motivation for this alteration is that unappealing presentations of lesson content have challenged teachers to gain students’ attention in the classroom. Since young students, especially those in high schools, are digital natives, teachers should relate AI concepts to real-life issues and involve interactive activities, games, or even unique factors to inspire middle/ high school students to learn AI (Estevez et al., 2019). Instead of making students focus on technical practice only, AI education should also provide students with elementary knowledge and skills related to AI, as well as connect their real lives with the technology (Dai et al., 2020). Similarly, Long and Magerko (2020) advocated that regarding Computer Science and AI education, students’ learning experiences can be improved if their interests are involved in the lessons, such as music or games.

Therefore, we proposed that starting a lesson with a popular AI-related product could gain students’ attention more efficiently, which was indicated in our previous paper. Although the idea of illustrating AI concepts by exemplifying AI-enhanced tools is not unique, it still has distinctive features in our pedagogical proposal in this paper. Instead of simply taking AI-powered products as examples after introducing a complex AI concept to students, teachers will start a lesson by analyzing an actual AI-powered gadget or device that is most related to students’ life first. Besides arousing students’ interest and active participation in studying AI, this idea is expected to increase the cultural adaptability of AI lessons. Specifically, teachers can flexibly choose AI-powered applications or devices that are more popular with their students. According to Eguchi et al. (2021), learners in different countries are familiar with different AI applications or devices that are more popular with their students. For instance, while Yahoo! Japan is the most common Internet service that Japanese people use, Google stands the first position in U.S. popular search engine.

In this paper, we limit the grades for the AI curriculum down to middle and high school only, instead of using the “K-12” terms as other reference research mentioned above. Considering the complexity of AI concepts and the idea of teaching AI knowledge to students without Math and programming backgrounds, we believe that students should at least enter middle schools to be able to understand AI lessons. In terms of main users, our proposed application is suitable but not limited to technology teachers at middle and high schools, who teach non-technical students. There have been training courses for technology teachers at middle and high schools to gain enough AI knowledge to teach their students. However, conveying AI concepts to students without a multidisciplinary background in programming and Math is never an easy task. Therefore, the main purpose of this application is to alleviate teachers’ difficulties in creating AI lesson plans for middle/ high school students, who do not have specialized Math and programming knowledge.

4. Features and functions of the proposed application

First, we plan to develop a web-based application. Four main functions of this application mentioned in our previous work are (1) recommend related AI-enhanced tools/ devices corresponding to AI content teachers want to teach; (2) update AI national education standards automatically; (3) provide teachers with open reference resources and an integrated search engine; (4) conduct teachers’ community to share or co-design AI lesson plans. Due to the dependence on the Internet to operate, we think that a web-based application is universally accessible and easier to update with minimal hassle.

4.1 General features

Apart from the four main functions mentioned above, we plan to add more services that our application can offer to teachers. While the application can automatically update AI national education standards in case many countries do not have a standard AI curriculum, it will gather information on national technology education instead. Generally, our application will provide teachers with available learning objectives for each lesson and teaching content. Meanwhile, middle/ high school teachers can flexibly modify every teaching or learning material suggested by our application. Specifically, they can adjust recommended lesson content, learning objectives, and students’ activities inside classrooms, or control time allocation for each part of the lesson. Teachers’ modification is important in making the learning content suitable for students’ ability and school conditions because context impacts teaching and learning significantly.

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2 K-12: from Kindergarten to 12th grade. K-12 is an education terminology, used in the United States, Canada, and other possible countries.
4.2 The difficulty level of AI lessons for middle and high school students

As mentioned in the previous paper, we used “The five big ideas of AI” provided by AI4K12 (ai4k12.org) as a standard to decide which content students are expected to know. AI4K12 is sponsored by AAAI and CSTA, which offers educators and learners national instructions on AI education for K-12 levels, reference resources for AI knowledge, and a community of AI researchers and specialists (ai4k12.org). With the reliability and comprehensiveness of AI4K12, we believe that the AI curriculum suggested in this paper can cover the majority of fundamental AI knowledge that students need to understand.

It is challenging to have a one-size-fits-all AI curriculum for middle and high school students since we cannot teach them all AI concepts introduced at the university level. Based on the AK4K12 curriculum, we rearranged and decided on separate difficulty levels for grades 6-8 and grades 9-12. Although students in different grades have different understanding abilities and background knowledge, a unified application can be shared for both middle and high school students. The proposed application will separate lesson content and difficulty levels to make AI lessons suitable for the understanding of middle and high school students. While middle school students discover the existence of AI and how AI is different from humans, high school students will begin to understand basic AI-related concepts and how AI is exploited in their daily life. On the other hand, teachers can still choose lesson content flexibly if they want to teach students advanced knowledge. Thus, although the application separates AI lessons for middle and high school students, it does not prevent teachers from choosing teaching content that fits their students the most. Simplifying AI learning content does not mean that teachers cannot introduce advanced AI knowledge to their students. With the abundant reference resources, teachers can research advanced AI lessons that might not be included in the application from the beginning. Finally, pedagogical approaches will be described in detail in my next research paper.

4.3 General introduction of AI teaching content proposed by our application

In our previous paper, we divided our AI curriculum into three main categories, including (1) AI fundamental concepts; (2) Ethics and social impacts of AI; (3) Using and developing AI. This dividing method is partially based on the AI education framework described in the report of UNESCO, 2022 (p.30). However, to customize AI lesson content for middle and high school students, we have specific adjustments to the AI education framework that UNESCO published in their report.

**AI fundamental concepts:** Regarding AI fundamental concepts, we conduct a curriculum based on the “Five Big Ideas in AI” of AI4K12 (ai4k12.org). However, AI knowledge presented in the “Five Big Ideas in AI” of AI4K12 has been modified according to students’ capabilities, which will be revealed in my next research paper. We aim to provide students, even those with no programming and mathematics background, with foundational perceptions of AI. Students are expected to understand what AI is, and how AI-powered applications can have human-like interactions before proceeding to the next stage (ai4k12.org).

**Ethics and social impacts of AI:** Ethical issues related to artificial intelligence have been achieving more attention, which can be considered one of the negative effects that AI technology has on society (Crompton and Burke, 2022). Despite the impressive benefits that AI can bring to society, AI-powered systems still have implicit risks (Ghosh et al, 2018). These issues include data privacy infringement (Akgun and Greenhow, 2021), bias and discrimination against AI (Long and Magerko, 2020), and an increasing information gap between data producers and data holders (Ghosh et al, 2018). Even when AI is exploited in education, the privacy of students and teachers can occur because they disclose their individual information on online platforms (Akgun and Greenhow, 2021). According to UNESCO (2021), the implementation of AI technologies in education can benefit users only when it follows ethical norms and promotes pedagogical human-centered methods. Since AI has both positive and negative effects on society (ai4k12.org), ethical issues related to AI-powered tools deserve our careful investigation and judgment (Li et al., 2019). As a result, recognizing AI’s potential risks will help students to protect their personal information while using AI-enhanced applications.

Leslie (2019) claimed that users and producers have to prioritize AI ethics and safety to optimize public well-being and control detrimental impacts, which will unavoidably arise due to unexpected mistakes of the technologies. UNESCO (2022) also declared in their report that people need to recognize ethical issues of AI, such as bias in datasets or security problems. In short, understanding ethical issues related to AI is essential to maximize the benefits that AI can bring to society.
brings to human society. In the next paper, I will reveal details of what students have to learn regarding AI ethical issues, including specific ethical problems of AI and the reasons leading to these issues.

Using and developing AI: Students are expected to know how to use AI techniques and AI technologies (UNESCO, 2022). One of the learning objectives is that students can understand some simple programming work, given that their schools can provide technology infrastructures for students to practice. They can also learn about how AI technologies have been developed recently, thus suggesting some ideas of using AI to solve social challenges or creating some new services for the community. Nevertheless, this section is optional due to its complexity. Teachers can still choose teaching materials from this field for students with advanced technical knowledge. Additionally, this part is expected to make up the smallest portion of the total AI curriculum.

The content of “Five Big Ideas in AI” offered by the AI4K12 program has been synthesized, adjusted, and analyzed to become understandable for middle and high school students. That modified knowledge will become different AI lessons, which our application will recommend for teachers. Nevertheless, this work is in progress, and it will be described more specifically in our next paper.

5. How to use the application

The process of introducing AI knowledge to middle/ high school students starts when teachers and students discuss choosing one AI-enhanced product (gadget or device) they want to analyze the most. This step can increase teacher-student interaction and spark learners’ interest in the upcoming AI lesson. Then, teachers will explain fundamental knowledge related to that product based on three divided categories, including (1) AI fundamental concepts implemented to create that product; (2) ethical issues and social impacts relevant to the AI product; and (3) simple algorithms or programming knowledge if necessary.

Figure 1 is the flowchart showing every step of how teachers can use our application to prepare their teaching materials. According to Figure 1, middle/high school teachers enter keywords to find and choose one AI Big idea and Concept first. Then, the application suggests a list of available lesson plans, which have been designed corresponding to each topic. Teachers choose many lesson plans from that recommendation list for the whole semester before proceeding to the next stage. If there are not enough lesson plans, teachers will search for other topics by keywords again (it means they go back to the first step). If AI educators are satisfied with the number of available lesson plans they found, the application will suggest AI-powered gadgets or devices to educators to cover each group of teaching topics. Specifically, teachers have two options, including (a) using one AI-enhanced product to cover a group of learning topics; and (b) choosing separate AI-enhanced tools for each lesson plan. If AI educators select option (a), the number of groups of learning topics is equal to the number of AI-related products (Figure 2, Sample screen 2). Conversely, when they prefer option (b), the total of chosen AI-enhanced products is the same as that of learning topics (Figure 2, Sample screen 1). If there is no adjustment needed, teachers can stop the process of deciding AI education framework and start to rearrange or add more content for each AI lesson, such as class activities and time allocation.

While teachers have to determine all teaching topics and corresponding AI-enhanced tools for the whole semester in advance, they can still flexibly modify every single detail of their teaching materials. Future adjustments may occur depending on social context, school conditions, and students’ learning progress.
Figure 1: The preparation process before creating an AI lesson plan.
Figure 2: How teachers can select AI-powered products based on learning topics

Figure 2 was mentioned in the flowchart to illustrate how teachers decide which AI-related product they should use to introduce AI concepts to middle and high school students. Because Figure 2 revealed only sample screens, there have not been specific titles for AI learning themes and lessons. Detailed AI teaching materials will be disclosed in the future when we have accomplished several samples AI lesson plans with proper content.

6. Conclusion, limitation, and future work

This paper revealed the first step of the application developmental stage. Instead of focusing on the technical aspect, we focused more on the content inside the application we proposed. In other words, our research emphasizes pedagogical methodology and AI lesson content with an aim to make AI knowledge more understandable for middle and high school students. Furthermore, this research is expected to recommend a different teaching method for teachers to increase students’ enthusiasm and learning outcomes.

Although the picture of our application was described a little clearer in this paper, we still have a long journey to complete. It might be harder to imagine how teachers interact with the application without specific sample AI lesson plans and names of some popular AI-enhanced products exploited to introduce AI knowledge. Additionally, we need a more detailed description of how we have adapted the AI4K12 curriculum to establish a different AI education program. These limitations will be solved in our future research. We also plan to reveal the table of data resources, which is implemented to construct various AI lesson plans. we will describe how fundamental knowledge provided by AI4K12 would be synthesized and analyzed to create effective AI lessons, whose content is suitable for middle/high school students’ abilities. Our next paper will also explain the pedagogical strategies behind the process of conducting our application to support middle/high school teachers in AI education.

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https://ai4k12.org/

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Mitigating Contract Risks
With Blockchain Technology

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ABSTRACT

A contract is defined as a legally enforceable agreement between two or more parties. This agreement clearly delineates the rights and responsibilities of each party to the contract, and there are legal consequences for breaking the contracts. Many different types of contracts form a foundational layer for businesses to operate successfully. These contracts can be with partners, vendors, employees, banks, lessors and customers.

As businesses become increasingly complex, the type of contracts used also become more detailed and multifaceted. Contracts always carry an element of risk that can affect individual participants, the business itself and as a collateral, the employees in the business. Risks related to contracts are part of operational risks and need to be managed vigilantly to avoid losses and lawsuits.

A large part of contract risks involve security risks with confidential information being shared with the wrong parties, financial risks that can occur when key dates and deadlines are missed, and regulatory risks when local regulations are not being complied with. As part of an Enterprise Risk Management system, an organization needs to take the necessary steps to assess and identify the risks, propose solutions, and implement the solutions with a feedback loop.

This paper proposes blockchains and smart contracts as a key method of mitigating contract risks. A blockchain is essentially a distributed digital system for recording a transaction in multiple places at the same time, with no central administration functionality. This ledger system was initially used to secure and verify cryptocurrencies like Bitcoin so that individual ownership records could be stored in a computerized database. Furlonger and Uzureau (2019) define blockchain as a “digital mechanism to create a distributed ledger on which two or more participants in a peer-to-peer network can exchange information and assets directly without the need for a trusted intermediary.” In its original form, the blockchain is an immutable, digital ledger that no one owns, but everyone can contribute to.

Smart contracts have added a layer of greater utility to distributed ledger technologies (DLTs) like blockchain. Smart contracts are computer programs specifically built directly into the blockchain. These contracts allow financial instruments like loans or bonds to be represented on the DLT. Smart contracts provide the same information to all participants and are immutable, thus reducing the possibility of manipulation. The terms of the contract are also automatically adjusted and updated, with reminders on due dates and deliverables. They also eliminate many middlemen and can be cost effective as well.

With its focus on security, decentralization and transparency, the blockchain is well positioned to handle risk management in the current environment of increasing global complexity.

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Promoting Students’ Computational Thinking Through A Physical Computing Project

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ABSTRACT

This study developed a physical computing project for Taiwan’s high school technology education curriculum to strengthen students’ computational thinking. The project asked students to develop a somatosensory computer game using the block-based programming language and physical computing devices. This study also attempted to explore the effectiveness differences between students with different majors. The research findings indicate that the project may help students improve their understanding of computational thinking concepts, but the improvement efficiency had no significant difference between students with different majors. This study also found that students’ performance on their project product showed no significant difference between the different groups of majors. These results imply that this project could be feasible to promote students’ computational thinking.

Keyword: physical computing, game design, computational thinking, project-based learning, major differences
Descending The Corporate Ladder (DCL): Correcting A Critical Staffing Problem

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ABSTRACT

The current organizational structure has been well designed and developed but the staffing function is an outdated problem. Decision makers rely on the information. Traditionally, most information was subjective (non-quantifiable information gained primarily from experience). Objective information (quantitative techniques and applications) was not adopted until the 1960s with the emergence of operations research and computers. The traditional process of starting new employees at the bottom of the organization structure and “climbing the corporate ladder” has remained a staffing standard.

However, this existing staffing procedure no longer places the best-qualified decision-makers at the top of the organization. Traditional decisionmakers are well versed in subjective information based on experience but lack knowledge and exposure to the newest more efficient quantitative techniques. Status quo and precedent, resulting from upward experience, cause top managers to be resistant to change.

The author proposes that “descending the corporate ladder” (DCL) could be a solution to the staffing problem. New employees would enter the organization at the top decision-making positions and subsequently move down the corporate ladder (DCL). The new hiring policy would be to hire from outside the organization. An obvious hiring pool would be MBA graduates from elite institutions where the latest quantifiable techniques and applications are developed, tested, and taught.

A DCL change in staffing does not require any change in the existing organizational structure, positions, or operations. It should increase the quality of decision-making throughout the organization. The new employees at the top will be offered the highest salaries to attract the best candidates. As they descend the corporate ladder there is less responsibility and stress. It is much easier to finally retire from a position with a low salary and title at a time when one has less energy and is ready to “enjoy life.”

This paper discusses the benefits, concerns, and applications of introducing the new DCL staffing function to an existing organization.

INTRODUCTION

Our modern organization structures have been well designed and tested to direct effort to the accomplishment of desired goals. Claude S. George Jr., in his book, The History of Management Thought chronologically describes the attributes of the modern organizational structure, designed to address authority and responsibility, line and staff relationships, spans of control, delegation and decentralization, job descriptions, informal organizations, etc.1

This paper does not intend to change any of the existing structures and attributes of an organization. Rather, the focus is on the staffing function. Instead, it defines the need for new employees to enter the organization at the top positions and work their way down to lower positions for retirement.

Effective decision-making relies on both the availability and use of subjective (non-quantitative) information based on experience and objective (quantitative) information. Subjective information is gained primarily by experience and was the main type of information before the development of quantitative techniques. Therefore, the traditional approach to organizational staffing has been for the employee to enter the organization at the bottom and work “up the corporate ladder” while gaining subjective experience, which was the basis for higher-level decision-making.
World War II created a major change in information needs. The scale and complexity of military organization problems expanded exponentially. Decisions concerning materials production and distribution, resource allocations, and logistics, on a worldwide basis, could no longer be satisfied with subjective information based on experience.

Quantitative techniques provided objective information to deal with massive problems on a timely and more efficient basis. World War II created a new field of operations research, introducing quantitative techniques including linear programming, simulation, queuing theory, and related empirical models.2

Following the War, business organizations adopted these new models. This was made possible with the development of computers to deal with the massive number of calculations on a low-cost timely basis, resulting in a major shift to reliance on quantitative models (quantitative information) for decision making.

The problem with today’s organizations is that top decision-makers do not have access to the most current, objective information, which has replaced subjective information gained through experience. The traditional “climbing the corporate ladder” was designed to develop subjective information based on experience, but fails to incorporate the more important need for quantitative information and techniques for best decision making.

My proposal to improve the organization is to hire the best decision-makers at the top. Instead of promoting up the ladder, the organization brings in the best and most current knowledge in quantitative techniques and their applications (objective information).

New employees will enter the organization at the top positions. They are young and vital, have the greatest need for salary, and have limited preconceived ideas. When new people are brought in they also will become outdated and should be replaced and moved down the ladder. During their career they “descend the corporate ladder” (DCL), having positions with less and less formal authority and responsibility. They have more options and time for planning their future.

DISCUSSION

Benefits, Concerns, and Application of DCL

A. The new DCL top manager will have a high salary for his early life needs and a high time-value return on his retirement investment. To discourage a top manager from early retirement as he moves down the ladder (DCL), a vesting program will be developed to protect the company from his potential leaving as he decreases in position and salary. To counteract his decrease in salary the company can offer a graduated company-wide profit-sharing program, where years of service would be given a higher percentage claim. The higher salary also enables the organization to recruit top qualified candidates for the top entry positions.

B. One of Henri Fayol’s main concerns was the detrimental impact of competition on cooperation in his organizational design. Competition (ie backstabbing or competitive advantage) is inherent and unavoidable in the traditional “climbing the ladder” staffing function. The new DCL paradigm greatly eliminates competition and promotes cooperation, thus solving the Fayol dilemma.3

C. Cooperation greatly opens channels of communication and promotes a combined effort toward accomplishment. It encourages the flow of ideas up and down the ladder. Former decision-makers at lower levels who have DCL’d can openly provide timely and relevant subjective information about the cultural milieu of the organization because they’ve been in their position and know their information needs. The top decision-makers can seek advice from lower managers in the organization who have a different perspective on the culture of the organization, but also understand the problems that top management is dealing with.

D. Fayol includes in his principles and elements of management, qualities, and knowledge desirable for all higher managers, which have been traditionally acquired through experience while climbing the corporate ladder. These are managerial abilities as stated by Fayol, under Part II: Principles and Elements of Management are:3

- Embracing foresight
- Drawing up the plan of action
- Building up an organization
- The art of handling men
- Harmonizing of all activities
The elite MBA programs are aware of FaFathe above-listed required abilities and incorporate them in their case-based and simulation coursework. Subjective factors, such as strategy, critical thinking, or human relations, can also be learned through internships. Acquiring this subjective information externally has the advantage of being free of any bias or constraints that may be present from climbing any corporate ladder.

1. If he encounters problems peculiar to the culture of the existing organization, the new manager can seek advice from the experience of the person below him, who previously occupied his top position.

Henri Fayol, in his 14 points, lists incentive as number 13, in which he expresses his concern that competition negatively impacts cooperation and hurts organizational performance. He states that competition is inherent and unavoidable in the traditional climbing the ladder staffing function (i.e. backstabbing).

5. By the pendulant shift to more cooperation, informal channels of communication will be opened.

6. Working down the organizational ladder he can settle into his functional area of the highest interest, be it marketing, production, administration, or human relations.

Quantitative techniques continued to be developed and become objective and efficient management tools after operations research was originally developed in 1946 and the military began using objective measures in their top management during World War II. Computers advanced quantitative techniques in the 1960s, making it possible to use these more efficient techniques and applications on a lower cost, timely basis.

SUGGESTIONS FOR FURTHER STUDY

A simulation of a DCL and/or setting up a case would be appropriate to test the efficacy of a DCL approach to staffing in a more efficient and timely manner than the traditional subjective experience-based system that remains in place for most organizations today.

ENDNOTES

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3 Henri Fayol General and Industrial Management 1968, 73

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Teaching About Introductory Sociology: Key Concepts
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ABSTRACT
This paper will examine some of the key concepts that can be used to teach about introductory sociology. Those concepts will include society, morality, personality, community, role, status, institutions, family, religion, human needs, social class, power, and population. Other concepts covered in the paper are the sociological imagination, micro level of analysis, middle level of analysis, macro level of analysis, social environment, gemeinschaft, gesellschaft, postindustrial society, group, dyad, triad, individual, primary group, secondary group, in-group, out-group, territorial community, nonterritorial community, race, racial group, ethnicity, ethnic group, minority group, racism, White supremacy, ideology, discrimination, prejudice, stereotype, segregation, expulsion, sex, gender, culture, assimilation, cultural pluralism, accommodation, acculturation, cultural relativity, subculture, imperialism, cultural imperialism, economic imperialism, nuclear family, extended family, alternative family, family of orientation, family of procreation, endogamy, exogamy, sacred, profane, religiosity, monotheism, polytheism, education, educational attainment, educational achievement, degree inflation, social capital, cultural capital, physical capital, community college, achieved status, ascribed status, empirical research, empirical data, research methods, research techniques, variable, hypothesis, etc. This paper contains some of the concepts included in the list of Earle Edward Eubank in 1932. It also contains some concepts that are not in the list.
Creating Positive Social Or/And Environmental Impacts Through Equity Crowdfunding: Evidence From Case Studies
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ABSTRACT

Equity crowdfunding - considered as a trustworthy form of alternative finance – is growingly used to address the funding gap for social and sustainable entrepreneurs (Carè et al., 2018; Rey-Martí et al., 2019; Langley et al., 2020) being able to tackle a wide range of environmental or/and social issues (Tenner & Hörisch, 2021). However, few studies have explored the crowdfunding phenomenon under the perspective of social impact investing (Carè et al., 2018). In recent times, several equity crowdfunding platforms are now focusing exclusively on the projects that are able to make a positive social or environmental impact by providing not only information about the financial aspects of the investment but also on the “impact-ability” of the project. This research study focuses on equity crowdfunding and on how it supports social enterprises and social impact initiatives. Precisely, we look at equity crowdfunding as a complementary financing tool that is useful for promoting social innovation, social change, and positive societal impact by cutting down the traditional attributes of financial investment. The aim of our research study is twofold. First, to explicate the characteristics of the social impact initiatives that have had resources through equity crowdfunding, and second, to investigate how equity crowdfunding helps social enterprises generate positive societal and environmental impacts. As few theoretical studies have yet explored this emerging research area, based on the grounded theory approach, this study adopts a multiple case studies methodology (Eisenhardt, 1989; Corbin & Strauss, 2008; Yin, 2013). Further, because of the study’s exploratory nature, we adopt a purposive non-random sampling technique (Eisenhardt & Graebner, 2007) in order to select cases to the point of redundancy and focus on projects characterized by a high social impact. Thus, we selected only five cases because they enabled us to analyze the phenomenon in-depth.

Preliminary results are encouraging and suggest that equity crowdfunding can be considered as an interesting tool to support both social enterprises and positive social impact projects.

Finally, this study has some very important theoretical and practical implications. Theoretically, the scientific study provides knowledge regarding equity crowdfunding in the context of social entrepreneurship and impact investing. Practically, this study explicated that crowdfunding (more specifically equity crowdfunding) is a trustworthy funding alternative for social enterprises and impact investors.

Keywords: crowdfunding, impact investing, social enterprises, alternative finance

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Exploring The Relationship Between Social Innovation And Social Finance: An Overview
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ABSTRACT
Social Finance (SF) has been growing dynamically in several European countries in the last few years, resulting in innovation and experimentation (European Commission, 2016). Many research studies explicate that in SF markets, the ingredients from third sector finance, classical mainstream finance, and public sources have been adapted in order to design new and more accessible financing products/instruments that seek to fulfill the needs of social enterprises (SEs) and to support social innovation (SI) (Nicholls, 2010a, 2010b; European Commission, 2016). More in detail, Nicholls noted that SF can stimulate SI “because the investment typically challenges the institutional logics associated with conventional investor rationalities” (2010b, as cited in Moore et al., 2012, p. 116). SEs – delineated as business organizations with “an explicit aim to benefit the community” (Defourny & Nyssens, 2010, p. 12) – use different forms and amounts of financing for different purposes, mainly depending on the field of activity, business model, and maturity stage of the enterprise (European Commission, 2016). Most scholars agree that SF can be considered as the main way to help SEs to find the right mix of instruments and approaches by developing a tailored social financial ecosystem. In this regard, during the last few years, “the European Commission (EC) has encouraged the development of the relationships between SF and SEs” (Trotta et al., 2021, p. 71) because of their ability to address some of the crucial issues that Europe is currently facing (Sepulveda, 2015; Gonçalves et al., 2016; Păunescu & Evans, 2018). However, despite the growing academic interests around the concepts of SF, SI, and SEs and around the common thread connecting them, much remain to be learned. Moving from this consideration, this work aims to provide a comprehensive analysis of the relationship between the concepts of SF, SI, and SEs by using a bibliometric approach. The added value of this work can be found in the effort to explore this new emerging field of study and to explore the related challenges and opportunities.

Keywords: social finance, social innovation, social enterprises

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The Future Of Teacher Education, VR, SEL, Technology
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ABSTRACT

The recent Covid Health Crisis, in which most onsite classrooms, both P-12, and Higher Education, were closed due to concerns about spreading the virus by personal contact, resulted in the majority of classes taught remotely/online. Remote instruction, as a result, was the mode of instruction for the past two years and it remained the mode of instruction until mid-year 2022, when classes are returned to onsite instruction. The education of teachers was particularly impacted, especially for those teacher education requirements for in-class student teaching and for in-class observation and evaluation of student teachers. As a result, waivers were obtained from accrediting agencies to use virtual reality (VR) classrooms accessed by online technology-based learning management systems, including live video conferencing systems, with the primary conferencing system used being Zoom. VR simulation software can provide teachers with similar situations they will have to face in an onsite classroom. It can allow them to test various responses to see how the avatar students react. The Covid period of remote learning, which mandated remote or online education, gave educators at all levels an opportunity to see how Virtual Reality, Social Emotional Learning, and various technology techniques and systems could be combined and integrated. These applications and systems allowed for the creation of an effective teacher education environment to effectively prepare teachers for teaching at both the P-12 and Higher Education Levels. Information on the following pages provides an evaluation of the specific teacher education environment at NU, consisting of the integration of SEL, VR, and Technological Applications which proved the effectiveness of these systems. Teachers can successfully be prepared for the classroom using the remote teacher education approach implemented during the Covid crisis, which, combined with onsite classroom teaching environments, the hybrid approach of integrating both systems are highly effective.

Introduction

To better understand and appreciate how the formation of a hybrid system of onsite and remote education systems, in which virtual reality techniques, social emotion learning concepts, and technological capabilities/applications, are integrated to better prepare student teachers, a review of each, separately, would be informative. The effectiveness of such an integration was proven in the National University’s teacher education program during the Covid crisis out of the necessity to substitute VR classrooms and video teleconferencing sessions for onsite classroom student teaching to satisfy accrediting agency requirements. SEL principles and concepts had been integrated into the teacher education programs before the Covid crisis but were further developed and refined during the crisis.

Virtual Reality Capabilities and Techniques for Teacher Preparation

In the beginning of the Covid crisis when the state of California mandated that no onsite teaching, to include student teaching, would be allowed in classrooms, the NU College of Education faculty developed a student teaching approach that used a combination of online video teleconferencing sessions that were combined with virtual reality classroom software sessions that simulated onsite classroom teaching and learning. This approach to simulating an onsite classroom was submitted California Commission on Teacher Credentialing (CCTC) who approved the approach and allowed the NU College of Education Department to continue preparing and credentialling teachers.

The VR software selected and used was “simSchool” (simSchool, 2019) and was fully online with a flexible web-based simulation of the classroom available 24/7 on any device at any time. This classroom simulation provided by the simSchool software increased confidence in teaching for both student teachers and interns while allowing them to increase their knowledge of strategies for instruction, ways to manage students in the classroom, and increase their knowledge of student cognitive, emotional, and cultural differences. SimSchool classroom simulation performance
was proven by research-validated outcomes based on the software’s research by Christensen, R. and et al (2011), which indicated the following:

- Students’ confidence in teaching was increased
- Students’ technology self-efficacy was improved
- Students’ knowledge of instructional strategies was enhanced
- Students’ knowledge of behavioral management techniques advanced
- Students remained longer in the teaching profession
- Students improved their understanding of student cognitive, emotional, and cultural differences

In the development of the classroom simulation software, simSchool and the Association for Advancing Quality in Education Preparation (AAQEP), collaborated and consulted on the development of simSchool VR software and focused on four AAQEP learning standards (SIMSCHOOL, 2019) which were:

Standard 1: Completer Performance behaviors are observed, assessed, socialized, and researched through simulated technology.

Standard 2: Completer Professional Competence and Growth which allows teacher candidates to become familiar with school and community cultures.

Standard 3: Quality Program Practices which develop and implement quality clinical experiences.

Standard 4: Program Engagement in System Improvement, which interacts with local community supporters and stakeholders to assist schools in high need of resources.

During the Covid crisis, when onsite in-classrooms were not available for student teacher preparation and experiences, simSchool allowed NU teaching credential preservice and in-service teachers to use simulated classrooms for practicing teaching methods and classroom management.

Social Emotional Learning

According to Stringer (2019), the concept of Social Emotional Learning began usage in 1995 following the release of the book “Emotional Intelligence.” Research done into the concept that the success of students in mastering the subject matter content of a given field of study depends on their emotional intelligence as well as their academic intelligence. Emotional intelligence is the ability of people to regulate their emotions and understand the world (Stringer, 2019). Adams (2017) defined SEL as an organized method of teaching a person behavioral, self-management, and relationship skills that include the following: teaching them how to get along others, helping them develop the skills of emotional intelligence that allow a person to understand what they are feeling, showing them how to express empathy for others, and creating healthy relationships while making responsible decisions. According to Stringer (2019), familiarity with social emotional learning is beneficial for students in the classroom in that it shows students how to improve control their emotions, be attentive to their teachers, and interact better with their peers. SEL has also been shown, based on Stringer’s (2019) research, to increase the test scores and grades of students, increase on-time graduation, enhance student college enrollment, advance the financial earnings of students as adults, and assist and promote their well-being, both mentally and physically.

Technology Systems that Enhance and Support Teaching and Learning

California Commission on Teacher Credentialing (CCTC Standards, 2016) establishes Teaching Performance Expectations (TPE). Teaching Performance Expectation 3 requires new teachers to develop technology-rich environments which includes their learning how to design, develop, implement, and evaluate such environments. To create such environments, they must know how to customize the curriculum and provide learning opportunities and assessments to address each student’s needs. In such an endeavor, the new teacher must work with instructional designers to best utilize instructional technology tools. These instructional tools should include the latest assistive technology software and hardware. When the learning experiences are designed, the California State Standards must be addressed as should promoting the students’ critical thinking, enhancing their ability to conceptualize subject matter.
principles, and improve their creative learning. In the period of the Covid crisis, this TPE was met primarily with technology systems and support in the form of Internet-based Learning Management Systems (LMS) and video teleconferencing systems (VTC), especially “Zoom.” There have been many video teleconferencing systems embedded in LMS platforms used for online classes, still Zoom is the first one that can be used intuitively by teachers/professors and students alike with little or no technical problems or usage issues.

Integration of VR, SEL, and Technology to Enhance Student Teacher Preparation.

Multimedia technology applications, including VR, can easily be embedded into the LMS to make the online curriculum more visual and effective for learning. In contrast, VTC systems such as Zoom make face-to-face interaction and engagement between instructors and students on the course content readily accessible within an hour. If the VTC interaction capability is combined with the VR simulation of being in a classroom, then the student teacher can better engage real people and avatars to enable a social and emotional learning experience that can be recorded. The VTC and VR simulation recordings allow student teacher evaluators to assess the student teacher’s SEL reactions and decisions in a simulated classroom; they also allow student teachers to see themselves in action and judge and assess their performance.

Summary

As noted previously, National University is the leading private university teacher preparation program in California. Its teacher education credential program is certified by the California Commission on Teacher Credentialing and is also certified by the national Association for Advancing Quality in Education Preparation. Both certifications happened during the Covid crisis period in which NU continued to prepare teachers for teaching credentials even though the crisis prevented the normal and required procedure of placing and observing student teachers in classrooms. Using a variety of teaching approaches, including VTC sessions with students and VR classroom simulations, NU was able to convince the CCTC and AAQEP evaluators that student teachers were learning and mastering the teaching concepts that would enable them to be successful teachers in the classroom, regardless of whether the classroom instruction was done remotely, in an onsite classroom, or a hybrid of both.

Conclusion

During the Covid crisis, the NU faculty had to determine how to continue to prepare student teachers for the classroom, given that they would not be able to place student teachers in onsite classrooms student teach. As the Covid crisis began, NU learned that it would be evaluated in the coming year by the state (CCTC) and national (AAQEP) for certification/re-certification of our teacher preparation education programs. By integrating and combining the capabilities and potential of VR, SEL, and Technology applications, as described and outlined above, we were able to show, via the data in our Tableau Analytics system, that students’ grades in our teacher education program classes continued at the same level as before the crisis. We concluded, therefore, that due to the proven effectiveness of remote teaching and learning concepts such as LMS platforms, VTC communication and interactions, and VR Class simulations, substantiated by our data analytics assessment, remote teaching and learning techniques should be continued and integrated with onsite in-class student teaching as Covid recedes and students and teachers return to the classroom.

The case is made that a combination of on-site in-class student teaching, enhanced and supplemented by remote VR simulation practices and VTC live sessions, supported by the multimedia and visualization applications of LMS platforms, are the future of student teacher preparation. Educators at all levels should consider such an approach to improve and grow their student teacher education programs. Such a combination could significantly make the teacher preparation programs more attractive and successful in addressing the current teacher shortage.

References


Living the Lessons – Immersion of Learners into the Environment Being Studied

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ABSTRACT

What if a business school that taught management used the theory that they taught to manage their own school? Further, what if that management theory included concepts such as operating as a system, knowing how to get knowledge from theories, information, and data, using psychology of learning theory, and understanding where variation comes from? These are concepts that W. Edwards Deming integrated into a management theory for all types of enterprise.

This paper explores the ramifications of a radical change from a traditional academic environment in a university setting to a customized approach that incorporates Deming’s ideas by elimination of exams and inspections to achieve better outcomes and focuses on improvement and learning for both students and faculty. Challenges to creating such an environment will be discussed, as well as approaches to curricula structure, and teacher onboarding. Many examples will be drawn from twenty-two years’ experience with the Deming Scholars MBA program at Fordham University in New York City. The paper includes a comparison of outcomes between the old MBA and this immersive one.
Fair Trade Mission: Changes and Effects

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ABSTRACT

Fair trade coffee garnered much attention worldwide and was the subject of many academic papers in the late 90’s and early 2000’s. It began in earnest in North America when TransFair USA (now Fair Trade USA) was created by its founder and CEO Paul Rice to organize the fair trade business in North America. From their website, Fair Trade USA says, “We were a small but mighty group, working in partnership with a handful of rural farmers and a few mission-driven coffee companies who believed the fair trade movement would become part of a much larger shift toward conscious consumerism.”

Initially, groups of farmers from outlying areas would be recruited to form democratic coops. Not only would farmers receive a higher income for these crops, the coops would also receive payment to make the community a better and safer place to live. Those improvements may have been on the business side, for example, coffee warehouses where coops could handle more duties in the process to increase the value of their coffee beans. Or the money may have gone to schools, water projects, health clinics, or other community projects to raise the standard of living for those farmers. By 2011, there were about 360 coops raising the living standards of tens of thousands of poor farmers and their families.

Up until 2009, most of the academic research media reports were positive, but a more negative tone was included in many articles leading to a 2011 decision by Rice and Fair Trade USA. The criticism included:

- Workers for farmers in the coops received substandard wages.
- The increased payments for coffee did not actually go to farmers but to administrative agencies.
- Small farmers were prospering under the system, but what about workers at coffee plantations. Shouldn’t they be protected under fair trade?

In 2011, Paul Rice announced changes for Fair Trade USA that seemed to consider and accept this criticism: It would accept coffee from plantations who agreed to pay a living wage. When asked about the consequences of this change on the 360 coops mostly in Latin America, he responded that many of them were in a precarious position now, and for the fair trade industry to continue to prosper and bring others into their tent, these changes needed to be made. Critics of this speculated that the changes were made because large corporations who needed coffee beans to be in larger “like” quantities, and that this shift to plantations meant that Fair Trade USA wanted to recruit larger corporations.

This research will focus on the changes implemented by Fair Trade USA. An argument against purchasing from plantations is the possible negative effect on the coops set up by and for small farmers. As one of the proponents of the coop system remarked, “We were doing a good job setting up coops and communities that helped the poor farmers and their families prosper. Changing the fair trade coffee program may endanger our efforts to do this.”

This research will also look at the effect that this decision had on the small mission-driven companies that worked so hard to build the Fair Trade USA from an unknown certification to a well-known brand in North America from 1998 until the change in 2011. Instead of competing with other like organizations, the new companies highlighted on the FairTrade USA website include national chains including Kroger, Amazon, Whole Foods, Target, Aldi, Costco, Sam’s Club and others that probably would not be described as “mission driven.” Can the small companies who built the FairTrade USA brand survive against larger companies also carrying the FairTrade USA certification? And if they are able, did they need to change marketing tactics to be successful? Did Fair Trade USA take away the competitive advantage these mission-based companies worked so hard to attain?
Quality Of Work Life And Its Impact On Quality And Productivity In Handicraft Sector In British Columbia

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ABSTRACT

The economy across the globe is under terrible slump due to recent COVID 19 and Russia-Ukraine war and needs to take rigorous measures with the help of certain tools to boost employment opportunities and standard of living. This may bring about better balanced and integrated parameters of economy. The various sectors have a big scope to deliver promising pathway for the same. One of them at the top, Craft/Handicraft sector is one of the top solutions for achieving this objective. The British Columbia’s handicraft sector is increasingly being recognized for higher-grade items as compared to its competitors due to its artistic value and quality. The quality of these products and the productivity of employees working in handicraft sector are highly influenced by their quality of work life. This study considered different variables like nature of job, experience and gender of employees. The various qualitative and simple statistical tools are used to analyze the data collected from 97 handicraft personnel during the period between January 2022 to May 2022. This research tends to impose a model exclusively based on craft workers in British Columbia, Canada.

Keywords: Handicraft, Quality, Productivity, Quality of work life
Perspectives On The Information Technologies Being Used In The Battle Against COVID-19

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ABSTRACT
Information technology (IT) has been paramount in the battle against COVID-19. This article reports the initial findings on our review of 212 articles on ITs use during the COVID-19 pandemic. We identified over 78 unique technologies that are being used in the battle against the pandemic. We grouped these technologies in five areas. This article discusses these five groups of technologies and offers perspective on what studies need to be conducted to better guide the use of IT in the fight against COVID-19 and future pandemics.

Keywords: technology and COVID-19, contact tracing, IT and pandemics, information technology and disease
How Resiliency and Motivation Help To Sustain At Promise Students In Urban Schools
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ABSTRACT

In today’s urban educational system there are many students who come from impoverished areas and are overlooked while not being provided with the proper essentials to succeed in secondary schools. Many at promise (formerly known as at risk) students rely heavily on motivational techniques, educational theories, and leadership approaches to help validate their chance of establishing a growth mindset for sustainability and success. Sometimes urban schools fall short and are not able to provide and stakeholders are forced to rely heavily on community organizations to help pursue aspirations. At promise students have been overlooked and have not been led to secure a pathway to success. It is imperative for urban education to adopt a variety of educational theories, including, but not limited to the path goal theory, grit theory, growth mindset theory and situational approach theory which can provide students with beneficial approaches that can assist and provide a better chance at securing a future and be able to graduate and fulfill their dreams. The general research question that was investigated was, How can urban students who experience obstacles learn motivational strategies, adapt effective educational theories, and build leadership skills to enhance a growth mindset and sustain education resiliency? A mixed methods triangulation study was conducted to gather quantitative and qualitative data. Primary data was collected from participants interviewed one on one along with creating two separate focus groups within secondary education. It was determined that social emotional learning, school climate, relational support, growth mindset and motivational strategies all are success indicators for urban youth.

Keywords: At-risk, At-promise, urban schools, resiliency, secondary motivation
Analysis Of Onomatopoeia Impression For Understanding Japanese Manga Culture

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ABSTRACT

In Japan, onomatopoeia is utilized not only in daily conversation but also in various other situations. It is an indispensable part to understand the Japanese language. Onomatopoeia is used frequently in Mangas, which are particularly popular items from Japanese culture. However, understanding or mastering onomatopoeia is difficult, when learning Japanese or enjoying Japanese culture, since Japanese onomatopoeia is a variety of words based on sensation. We extracted onomatopoeia commonly used in Japanese famous Manga works, and selected 50 types of “Frequent Onomatopoeia in Manga.” Then, a survey was conducted to determine what they generally mean in each usage. The purpose of this study is to present the onomatopoeia, which resulted in common impressions among many people so that they can be made most of them by people from abroad as the springboard to learn Japanese onomatopoeia and to enjoy Japanese Manga more deeply. As a result, 7 of the 50 onomatopoeias had a common meaning or impression shared by approximately 70% or more of the respondents. This indicates the variety of meanings that each onomatopoeia has, and represents that it is difficult to define one general meaning based on textual information alone regarding Japanese onomatopoeia. Therefore, future research should consider ways to make the meaning and impression of onomatopoeia easier to understand, by using cartoons or illustrations in addition to texts.

Keywords: Onomatopoeia; Japanese Manga; Learning Japanese

1. Introduction

1.1 Background

Onomatopoeia is a word that describes various situations or movements with a combination of sounds. For example, “wan-wan” (English: ruff-ruff) is the sound of a dog’s bark, and “zaa-zaa” (English: pouring rain) is the sound of rain. Japanese onomatopoeia can be classified into three types: the onomatopoeia (animal and human sounds) created by imitating animal noises and human voices (English: ruff-ruff, screaming, Japanese: wan-wan, kya-), onomatopoeia (real-world sounds in nature) created by imitating various sounds in nature (English: pouring, slam, Japanese: zaa-zaa, gatan), and mimetic words that describe the condition of things and actions, situations, feelings and psychological states (English: beating heart, irritation, Japanese: doki-doki, ira-ira). In Japan, onomatopoeia is used widely not only for everyday conversation but also for manga, novels, picture books, advertisements, and product names. It is also said that there are more types of onomatopoeic words in Japanese than in other languages, with approximately 2,000 words in dictionaries and 400 to 700 words in daily use. Unlike in Western countries where onomatopoeia is often used for communication with babies or toddlers, in Japan, adults frequently use onomatopoeia in everyday conversation. Therefore, onomatopoeia is an essential element regarding communication in Japanese.

Manga is one of the most popular items from Japanese culture, and many of the works have been translated and enjoyed by people overseas. Onomatopoeia appears quite often in Japanese Mangas. While the information in the form of sound is absent, it serves to convey each scene’s clear image of the story to the reader. In short, understanding onomatopoeia is important to enjoy Japanese Manga. However, Japanese onomatopoeia is more abundant than that in Western countries and is a sensory language based on Japanese cultural-specific word sense. Therefore, it is expected to be difficult to learn for Japanese learners from other countries. In Mangas, onomatopoeia appears along with the picture, and it is conceivable that even people from abroad who do not know Japanese, can understand the meaning with a simple explanation. Manga is a convenient medium to explain Japanese onomatopoeia to overseas people in an easy-to-understand manner, making it suitable for learning onomatopoeia.
1.2 Purpose

Understanding onomatopoeia is an essential element in enjoying Japanese Manga. However, the variety of Japanese onomatopoeia is so large that it is hard for people from abroad to learn all of Japanese onomatopoeia one by one. Based on this background, this study selected 50 frequently used onomatopoeia in Japanese Manga from well-known works as “Frequently Appearing Onomatopoeia in Manga.” The purpose of this study is to clarify the meaning of onomatopoeia frequently used in Manga to support Japanese onomatopoeia learning. We also think that knowing the 50 onomatopoeias and understanding their meanings and impressions will help readers to enjoy Japanese Manga more deeply. Onomatopoeia in Manga is accompanied with pictures, and it has the characteristic of being visually comprehensible. Therefore, learning frequently appearing onomatopoeia in Manga is an appropriate introduction to Japanese onomatopoeia learning. However, there are many Japanese onomatopoeias that are composed of exactly the same sounds, but have different meanings. For example, don-don which expresses the sound of hitting something is classified as an onomatopoeia imitating actual sound, while don-don which expresses the way things progress one after another functions as a mimetic word. Although they both have the same sound, they describe different things. Thus, Japanese onomatopoeia can often express different situations or meanings regarding one single word, but this complexity makes it more difficult to learn the onomatopoeia. Therefore, in this study, a questionnaire will be conducted to clarify how frequently-appears onomatopoeias are used with particular meanings, in addition to the selection of those onomatopoeia from Mangas. Then, we present the onomatopoeia, for which the impression is common among many respondents, as a springboard for people from abroad to learn Japanese onomatopoeia and to enjoy Japanese Manga more deeply.

2. Onomatopoeia in Manga

In this chapter, we will discuss the characteristics of Japanese onomatopoeia and how important it is in Mangas. First, Japanese onomatopoeia has a distinctive word form or structure. Particularly common type of onomatopoeia is the type in which the same sound is repeated such as doki-doki (English: ba-dump ba-dump) and zara-zara (English meaning: rough). In addition, a variety of derivational forms can be created from a single word base. For example, many words with similar meanings can be derived from the word base “doki,” such as “dokiri,” “dokkiri,” “doki-doki.” These particular word forms distinguish onomatopoeia and mimetic words from other common words. This is one of the unique characteristics of Japanese onomatopoeia. Also, as it is said that Japanese onomatopoeia is generally expressed as an ‘adverb + verb’ and English onomatopoeia as ‘a single active verb’, there are differences between Japanese and English onomatopoeia. Relevantly, the reason for a wide variety of Japanese onomatopoeia is the limited number of Japanese verbs. For example, when we focus on “laugh”, in English, there are many words to express it with a single verb, such as ‘laugh’, ‘smile’, ‘giggle’, ‘grin.’ In Japanese, the variations are limited to just the words ‘warau’ or ‘hohoemu,’ meaning ‘laugh’ or ‘smile’. However, onomatopoeia like gera-gera (English: guffaw), kusu-kusu (English: giggle) and niyari (English: grin), which express the “state of laughing,” are abundant.

Japanese onomatopoeia is frequently used in Japanese Manga and plays a very important role. Since Manga is consisted of pictures and text, which are visual information, it is difficult for readers to directly image the diegetic sound. In such situations, onomatopoeia is an entity that helps the readers to realistically image sound information that is originally missing.
For example, in the left picture of Figure 1, the onomatopoeia, “zaa-zaa” is used to describe a downpour. By turning the actual sound into letters, this serves to make the situation of downpour more realistic and obvious, and to convey a sense of presence for the reader. The picture on the right of Figure 1 is an example that cannot be understood unless onomatopoeia is inserted. In this scene, the onomatopoeia “dodo” is used to describe the noise of something rushing outside the frame. This makes it easy to understand that something is happening outside the frame, even if the sound source is not depicted. It also allows the reader to imagine the world outside the limited space of the panel and to feel the impression of depth.

The use of onomatopoeia also makes it possible to express nuances in the situation and meaning of a scene. For example, the left picture in Figure 2 uses the onomatopoeia “da” when the characters suddenly dash out of the building. However, if the onomatopoeia used in this scene were “ta”, the imagined situation would change slightly. Most Japanese would imagine “da” to be more steadfast than “ta” and to show a vigorous running start. On the contrary, the “ta” sound evokes a light-footed start, and a reader would not feel a sense of urgency. This is because it is generally believed that a “voice sound” with a voiced sound mark gives a weighty impression than a “unvoiced sound” without a voiced sound mark, in Japanese. Thus, Japanese onomatopoeia is such an important element that even minor changes in the constituent sounds can alter the meaning and image of a situation. Furthermore, Japanese onomatopoeia plays an important role even in situations where no actual sounds are being made, and it conveys the image of the scene to the reader in an easy-to-understand manner. For example, the onomatopoeia “don” is often used in scenes where important characters in a story appear, as indicated in the right picture of Figure 2. No “don” sound is heard at the moment when the person appears in reality. However, when onomatopoeias are inserted together with pictures, they can play the role of sound effects and create a certain “presence.” In this way, Japanese onomatopoeia is used in the Manga in a variety of situations and plays an important role in helping readers understand the story more easily and appropriately.
3. Related Research

3.1 The Expressiveness of Onomatopoeia in Japanese Manga

Izawa (2017) compared onomatopoeia when it is used in novels and when it is used in Manga to investigate how onomatopoeia works for the expressiveness of manga. In the study, onomatopoeia is extracted from Hiro Arikawa's novel, “Library War: Library War Series 1” and Yumi Kiiro's “Library War: LOVE & WAR 1,” a Manga adaptation based on the work. The study then investigates the expressive power of onomatopoeia in story situations and in the psychological descriptions of characters, from both sides of novels and Mangas. The consideration from the results lead to the conclusion that illustrations compensates for the lack of verbal description in Mangas, while detailed text compensate for the lack of visual information in novels. The author also highly evaluated the expressive power of onomatopoeia in Manga as it has connotations that go beyond the meanings given in the dictionary.

3.2 Kinetic Onomatopoeia Generation System for Creating an Attractive Digital Comic

3.3 In this study, Matsushita et al. (2011) focused on comics using digital terminals as the medium and examined a system that can generate expressions which make most of the characteristics as digital terminals. Particularly, for the search of new ways of onomatopoeia (sound metaphors) expression in digital comics, they have been conducting research on the onomatopoeia classification by sound image and morphological characteristics in order to give each onomatopoeia an animation that fits it. The authors proposed a system that allows the user to give sensation of movement that corresponds to the onomatopoeia (sound metaphor) of the comic by adjusting parameters. This is an example of a study that proposes a new method of expression regarding onomatopoeia in Mangas.
4. Questionnaire on Frequently Appearing Onomatopoeia

4.1 Selection of Frequently Appearing Onomatopoeia

4.2 In this study, we referred to seven famous Manga works in Japan and extracted the onomatopoeia used in them. The works used were “Dragon Ball” volume 1 by Akira Toriyama, “Doraemon” volume 1 by Fujiko F. Fujio, “JoJo's Bizarre Adventure” Part 1 volume 1 by Hirohiko Araki, “Demon slayer” volume 1 by Koyoharu Gotouge, “ONE PIECE” volume 1 by Eiichiro Oda, and “X” volume 1 by CLAMP. We also partially referenced to “Dragon Ball” Vol. 2-3, “Doraemon” Vol. 2-15, “JoJo's Bizarre Adventure” Part 2, Vol. 1, and “X” Vol. 2-3. After extracting all the onomatopoeias used in these works, among them, we selected 50 onomatopoeias that were used particularly frequently. Table 1 is the list of them as "Frequently Appearing Onomatopoeia in Manga".

<table>
<thead>
<tr>
<th>(ウ)オオオオ</th>
<th>キュッ</th>
<th>サッ</th>
<th>ドサッ</th>
<th>ハッ</th>
</tr>
</thead>
<tbody>
<tr>
<td>カァッ</td>
<td>グイッ</td>
<td>サッ</td>
<td>ドドド</td>
<td>パッ</td>
</tr>
<tr>
<td>ガサッ</td>
<td>グダダ</td>
<td>サワサワ</td>
<td>ドン</td>
<td>パッ</td>
</tr>
<tr>
<td>ガシッ</td>
<td>ゴオオオ</td>
<td>シューッ</td>
<td>ハア(ハア)</td>
<td>パン</td>
</tr>
<tr>
<td>ガタガタ</td>
<td>ゴゴゴゴ</td>
<td>ズズズ</td>
<td>バーン</td>
<td>ビク</td>
</tr>
<tr>
<td>カチ(ヤ)</td>
<td>ゴク(ゴク)</td>
<td>タタタ</td>
<td>バキッ</td>
<td>ビシ</td>
</tr>
<tr>
<td>ガッ</td>
<td>ゴシゴシ</td>
<td>ドッ</td>
<td>パクパク</td>
<td>ビュ</td>
</tr>
<tr>
<td>ガバッ</td>
<td>ゴロ(ゴロ)</td>
<td>ドーヌ</td>
<td>パシッ</td>
<td>ブルブル</td>
</tr>
<tr>
<td>ガラガラ</td>
<td>ゴン</td>
<td>ドカッ</td>
<td>パタパタ</td>
<td>ブン</td>
</tr>
<tr>
<td>キー</td>
<td>サー(ザー)</td>
<td>ドゴッ</td>
<td>パタン</td>
<td>ワーワー</td>
</tr>
</tbody>
</table>

4.3 Overview of the Questionnaire Survey

There are a certain number of onomatopoeias used in Japanese Manga that consist of the same sounds but have different meanings. Referring to examples used in the seven Manga works, we created a questionnaire with a total of five choices, including four possible options for the situation and meaning, for each of the 50 "Frequently Appearing Onomatopoeia in Manga," and the option of "Neither." Respondents were shown only the letters of the onomatopoeia and were asked to select one from the options that was felt most applicable to the situation or image that came to their mind when they saw the onomatopoeia.

4.4 Results of the Survey

The survey was conducted with 50 people. The onomatopoeia in which more than 70% of the respondents had a common situational impression was defined as an onomatopoeia with a clarified meaning or frequently appearing onomatopoeia from the 50 selected ones. There are the seven onomatopoeias with more than 70% of respondents having a common situational image. Table 2 summarizes the survey results that include each option and the percentage of received responses, also, the figures below Table2 show examples of their actual use in Manga.
<table>
<thead>
<tr>
<th>Sound</th>
<th>Description</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>ガシッ</td>
<td>Grab firmly 74% (37)</td>
<td></td>
</tr>
<tr>
<td>ガシッ</td>
<td>Strike something hard</td>
<td></td>
</tr>
<tr>
<td>ガシッ</td>
<td>Restraints on the body 4% (2)</td>
<td></td>
</tr>
<tr>
<td>ガシッ</td>
<td>Grab someone's arm and hold him/her back 18% (9)</td>
<td></td>
</tr>
<tr>
<td>ガシッ</td>
<td>None of the above 2% (1)</td>
<td></td>
</tr>
<tr>
<td>ガッ</td>
<td>Grab firmly 74% (37)</td>
<td></td>
</tr>
<tr>
<td>ガッ</td>
<td>Hit something 6% (3)</td>
<td></td>
</tr>
<tr>
<td>ガッ</td>
<td>Bump into something 6% (3)</td>
<td></td>
</tr>
<tr>
<td>ガッ</td>
<td>Staring / Being Stared 4% (2)</td>
<td></td>
</tr>
<tr>
<td>ガッ</td>
<td>None of the above 10% (5)</td>
<td></td>
</tr>
<tr>
<td>キーッ</td>
<td>Sound of sudden brakes 78% (39)</td>
<td></td>
</tr>
<tr>
<td>キーッ</td>
<td>Animal noises, such as monkeys and birds 4% (2)</td>
<td></td>
</tr>
<tr>
<td>キーッ</td>
<td>Angry / Take something seriously 12% (6)</td>
<td></td>
</tr>
<tr>
<td>キーッ</td>
<td>Nail scratching sound 6% (3)</td>
<td></td>
</tr>
<tr>
<td>キーッ</td>
<td>None of the above 0% (0)</td>
<td></td>
</tr>
<tr>
<td>グィッ</td>
<td>Pulling on something you have grabbed 78% (39)</td>
<td></td>
</tr>
<tr>
<td>グィッ</td>
<td>Pull something out 4% (2)</td>
<td></td>
</tr>
<tr>
<td>グィッ</td>
<td>Gulp down something with gusto 14% (7)</td>
<td></td>
</tr>
<tr>
<td>グィッ</td>
<td>Push something 2% (1)</td>
<td></td>
</tr>
<tr>
<td>グィッ</td>
<td>None of the above 2% (1)</td>
<td></td>
</tr>
<tr>
<td>ザー(ザー)</td>
<td>The sound of a downpour 90% (45)</td>
<td></td>
</tr>
<tr>
<td>ザー(ザー)</td>
<td>Slip off a cliff or other object 2% (1)</td>
<td></td>
</tr>
<tr>
<td>ザー(ザー)</td>
<td>The sound of the wind blowing and the trees swaying 6% (3)</td>
<td></td>
</tr>
<tr>
<td>ザー(ザー)</td>
<td>The way things are falling apart 0% (0)</td>
<td></td>
</tr>
<tr>
<td>ザー(ザー)</td>
<td>None of the above 2% (1)</td>
<td></td>
</tr>
<tr>
<td>バタン</td>
<td>Sound of a door or other object being closed hard 80% (40)</td>
<td></td>
</tr>
<tr>
<td>バタン</td>
<td>Slamming thing into the ground 4% (2)</td>
<td></td>
</tr>
<tr>
<td>バタン</td>
<td>A person suddenly falls down 12% (6)</td>
<td></td>
</tr>
<tr>
<td>バタン</td>
<td>Thing that have been propped on or against something, falls over 4% (2)</td>
<td></td>
</tr>
<tr>
<td>バタン</td>
<td>None of the above 0% (0)</td>
<td></td>
</tr>
<tr>
<td>ブルブル</td>
<td>Body shivering (from cold, and etc.) 78% (39)</td>
<td></td>
</tr>
<tr>
<td>ブルブル</td>
<td>Shake one's head 2% (1)</td>
<td></td>
</tr>
<tr>
<td>ブルブル</td>
<td>Objects vibrate 14% (7)</td>
<td></td>
</tr>
<tr>
<td>ブルブル</td>
<td>Animals shake off water by rapid skin twisting movement 4% (2)</td>
<td></td>
</tr>
<tr>
<td>ブルブル</td>
<td>None of the above 2% (1)</td>
<td></td>
</tr>
</tbody>
</table>
Figure 3. ‘gashi’ “Dragon Ball” Vol.1, p.7 (Left)
‘ga’ “Dragon Ball” Vol.1, p.101 (Right)

Figure 4. ‘kii-’ “Doraemon” Vol.1, p.25 (Left)
‘gui’ “ONE PIECE” Vol.1, p.30 (Right)
Figure 5: “zaa-zaa” “JoJo's Bizarre Adventure” Part 1, Vol. 1, p. 14 (Left)

Figure 6: “bfun-buru” “Doraemon” Vol. 1, p. 22 (Right)
5. Discussion and Conclusion

In this study, after extracting onomatopoeias from famous Japanese Manga works, 50 onomatopoeias were selected as frequently-used Japanese onomatopoeias. As a tendency, there were many onomatopoeias, which begin with the sound from “ka(ga),” “sa(za),” “ta(da),” and “ha (ba, pa)” lines of Japanese kana syllabary. Because of this, several from the selected onomatopoeias were similar in sounds. The meaning or impression of Japanese onomatopoeia can differ depending on the subtle differences in sound combinations. Despite of this tendency, we believe that the survey is meaningful for the purpose of revealing what each onomatopoeia generally makes as perceived impressions. The results of the questionnaire showed that among the 50 most frequently seen onomatopoeias, only 7 onomatopoeias were found to have a common meaning or impression by more than 70% of the respondents, which is a small number. This point indicates the variety of meanings or impression that each Japanese onomatopoeia has. In addition, since the respondents were asked to answer a questionnaire by looking at only the letters of each word. We concluded that it is difficult to define the general meaning or impression of Japanese onomatopoeias, which originally tend to have multiple meanings, based on only the text information. However, even though onomatopoeias have such complexity, we could identify onomatopoeias that are likely to have a common impression among people. As a result of this study, we propose a set of seven onomatopoeias, "gashi," "ga," "kii-," "gui," "zaa-zaa," "batan," and "buru-buru," as a springboard to understand Japanese onomatopoeia, eventually to help Japanese learners, and people from other countries who want to enjoy Japanese Manga more deeply.

6. Future work

The results of this study represents that it is difficult for people to obtain a common impression of Japanese onomatopoeia from the letters alone. This is because Japanese onomatopoeias often have more than one meaning. Therefore, we need to investigate how much difference there is in understanding the intended meaning of onomatopoeia when viewed with the letters alone, and when viewed with pictures. The survey will again determine the appropriateness of using Manga to learn Japanese onomatopoeia. The results of this study will also be used to propose specific methods to make people from other countries to understand Japanese onomatopoeias easily and appropriately when they learn Japanese or enjoy Japanese culture. Since onomatopoeia is a particular language based on sensation, we believe that it would be possible to support onomatopoeia learning by exploring methods that would enable visual understanding of its meanings and impressions. To realize this goal, we will continue to research specific ways to support the learning of Japanese onomatopoeia for Japanese language learners, by utilizing the onomatopoeias that Japanese people generally use with common meanings and impressions based on the questionnaire result of this study.

References

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Lian Zeqi (2022). Selection of Basic Colloquial Onomatopoeia of ABAB-Type for Learners of Japanese: A Corpus
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Design Of Interactive Systems Specialized For Human-Like Conversation Based On Utterance Record

Taishi Nemoto, Kagoshima Women's College & Toyo University, Japan
Takayuki Fujimoto, Toyo University

ABSTRACT

In recent years, AI (Artificial Intelligence) research has been conducted worldwide. With the rise of deep learning, AI research is attracting worldwide attention. It is not only automating clerical tasks, but also beginning to replace human jobs in conjunction with robotics. AI is also being used in the field of intellectual creation. For example, imaging technology is advancing at an incredible pace and is capable of producing images that rival those of humans. However, AI that implements human-like qualities or acquires individuality is far from complete. Furthermore, systems that support human activities or extend human intelligence are not yet widespread. In this paper, we propose an AP (Artificial Personality) system that specializes in human intellectual activities, especially humane conversation. This AP (Artificial Personality)-system is a bot that speaks based on words uttered by actual humans, rather than words generated autonomously by a machine. The goal is to build a system that can distract human beings from their worries and loneliness. Unlike existing chatbots, this system is capable of developing conversations based on the user's attributes and situation.
Sports Chaplain: Investigation
To Map Out Support Mechanism For
Top Athletes Facing An Absolute Crisis

Shogo Maeda, Toyo University, Japan
Takayuki Fujimoto, Toyo University, Japan

ABSTRACT

Pandemic, which spread globally beginning around 2019, had a variety of impacts. For example, the Tokyo Olympic Game, which was scheduled to be held in Japan in 2020, was postponed to 2021. At first, the postponement was also ambiguous and there was even a big possibility of cancellation. Domestic and international calls for the cancellation of the Tokyo Olympic Game grew, and doubts about the significance of holding the Olympics also arose. The one-year postponement led to a number of athletes withdrawing from the Games and their competitiveness becoming unstable or even declining. Since Olympic athletes, with the exception of a few star athletes, basically depend on sponsorships from companies and organizations for their livelihoods, the one-year postponement also caused great uncertainty in the athletes' lives and financial situations. The Tokyo Olympic Game was held under the most precarious and difficult conditions of any postwar Olympic Games. The athletes scheduled to compete were at the mercy of these unstable conditions. In particular, there was even a widespread perception that the Tokyo Olympic Game was "BAD," regardless of the efforts of the athletes. Such a trend troubled many athletes. Candidates for Tokyo Olympic Game, were forced into an unprecedentedly unstable psychological state. In this research, we conducted a qualitative investigation into the extreme mental states of Tokyo Olympic Game athletes at the mercy of public opinion and media coverage. The survey revealed that many top athletes scheduled to compete in the Olympic were anxious about whether or not the Olympics would be held. On the other hand, the only common way to overcome their anxiety was to say, "I don't think about it. Blind faith that the Olympics would be held" was the only common way to overcome their anxiety. In a sense, Olympians had no choice but to "stop thinking". In other words, the results of the survey revealed that top athletes are more inclined to believe that the anxiety and despair that arise when faced with "difficulties that cannot be solved by one's own efforts" which are not fundamentally resolved. When top athletes competing in the Olympic are faced with situations "beyond their control through their own efforts," what kind of care is possible for their leaders (Instructors, Coaches, Trainers, Managers etc...)? This research focuses on this point and examines the creation of a system to support top athletes.

Keywords: Tokyo Olympics2020, Athlete Support, Psychological changes, sense of absolute crisis

1. INTRODUCTION

1.1. Research Background and Purpose

The COVID-19 pandemic, which spread globally around 2019, brought a variety of impacts to the societies. For example, the 2020 Tokyo Olympic Games, which were scheduled to be held in Japan, have been postponed to 2021. In addition, the postponement of the Games was initially vague and there was even a significant possibility of cancellation. Domestic and international calls for the cancellation of the Tokyo Olympics became more clamorous, and doubts about the significance of holding the Olympics also arose. Athletes were tossed up and down by such an unstable situation. In this way, due to COVID-19, the Sports industry and the world of athletes also experienced a severe effect. Because of the one-year postponement, there were many cases where players declined to participate in the Olympics, or their competitiveness decreased for its instability. Basically, Japanese Olympic athletes, except few star athletes, make a living by sponsorships from companies and organizations, therefore the one-year postponement caused a great deal of anxiety in the circumstances of athletes' lives and financial situations.
The Tokyo Olympics were eventually held under the most unstable and harsh conditions of the post-war Olympics. The athletes scheduled to compete in the Olympics, had been negatively affected by the uncertainty. In particular, there has even been a widespread perception that the Olympics themselves is a "bad idea." without regard to the efforts of the athletes. Such a social trend has troubled many athletes. The athletes who were candidates for the Tokyo Olympics were forced to go through an unprecedentedly unstable psychological state. In this study, we conducted a qualitative investigation on the extreme mental states of Olympic athletes racked by public opinion and news coverage.

1.2. Related Research

A survey conducted by the Japanese Olympic Committee [1][2] among designated athletes for the Olympic Games shows the results as follows.

Regarding the respondents who reported increased communication during the declaration of the state of emergency, as to the percentage of the responses about the communication partners, about 15% was “with national coaches and their affiliated instructors,” and about 10% was “with support staff (doctors, trainers, and etc.).” Both occupies the small percentage. From the statistics above, it can be inferred that a new methodology for taking care of athletes' mental health is required. In regards to the question: “what kind of information about training and conditioning was provided during the period of the state of emergency?,” 20% felt that they were provided with information on mental health. Also, regarding the question: “what kind of information did you acquire, during the period of the state of emergency?,” approximately 15% of interviewed athletes obtained information about mental health themselves. The percentage of the athletes who reported that the mental health information they received was "helpful," was 14%. Considering that each response mentioned above was less than 20%, it can be interpreted that the existing support system is not actively utilized or is not functioning in respect of mental health care.

2. OUTLINE OF RESEARCH

2.1. Survey target, time period

In this study, we conducted an interview survey with 17 athletes (16 from the third round due to athletes' personal circumstances): 6 men's freestyle athletes (2 athletes with Olympic team offers, 4 with Asian trials team offers), 6 men's Greco-Roman athletes (1 athlete with Olympic team offers, 5 with Asian trials team offers), and 5 women's freestyle athletes (4 with Olympic team offers, 1 with Asian trials team offers). The detailed interviews were done once every two months from March 2020, when discussions about postponing the Olympics began, to March 2021, just before the event. The interviews were conducted by the author, who has a strong rapport with the athletes and is an official coach (wrestling competition) for the Tokyo Olympics, to ensure the highest possible accuracy. We conducted seven rounds of detailed interview surveys in total (once every two months from March 2020 to March 2021), about the top athletes’ attitudes, particularly their motivation to compete, when they were distracted by the news coverage focusing on whether the Olympics would be held or not, including the postponement option. Then we revealed how certainty of the Olympics at each time impacts on the top athletes’ mental conditions, analyzing the interview survey. We also examined the top athletes’ psychological transformation based on the analysis of the survey results.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Number of People</th>
<th>Average Age</th>
<th>Number of Times</th>
<th>Period of Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>male</td>
<td>12</td>
<td>26.4±2.6</td>
<td>7</td>
<td>March 2020</td>
</tr>
<tr>
<td>female</td>
<td>5</td>
<td>26±3.8</td>
<td>7</td>
<td>March 2021</td>
</tr>
<tr>
<td>whole</td>
<td>17</td>
<td>26.3±3</td>
<td>14</td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Survey Respondents
2.2. Methods and Questions

When conducting the interview survey, the purpose of the study and ethical considerations were explained orally to the respondents, and their consent was obtained in writing. The period was from March 2020 (starting period of COVID-19 infection spreading) to March 2021, and interviews were carried out once every two months, and in total, seven rounds of interviews were held. The first session was held in March 2020, the second in May, the third in July, the fourth in September and October, the fifth in November, the sixth in January 2021, and the seventh in March.

Regarding the interview method, as to the face-to-face interviews, audio and video data was recorded. As for the remote interviews, we utilized ZOOM or LINE video calls recording audio and video data as well. All interviews were transcribed and analyzed based on the recorded video data. The survey questions were based on the following, and besides, we tried to be flexible in our interactions with respondents, depending on their answers. In addition, the survey was conducted in a careful and respectful way utilizing the author’s position as a coach so as not to cause the athletes to have mental stress.

| Anxiety over whether or not the Olympics will be held |
| Motivation to practice and compete |
| What would you think as an athlete if the Olympics were cancelled? |

Table 2. Main Questions

2.3. Survey Results

The survey results by the interviews are described in detail below.

2.3.1. Anxiety about whether the Olympics will be held

From the first interview survey in March 2020, which began when the Olympics had not yet been postponed, to March 2021 (the seventh interview), athletes' anxiety about hosting the Olympics varied.

Fig. 1 shows trends of the presence or absence of anxiety about whether the Olympics would be held or not.

---

Do you have any anxiety about whether or not the Olympics will be held?

Fig1. Trend chart of total number of people with/without anxiety about whether the Olympics will be held
Athletes who responded as "with anxiety" were asked a question; "What kind of anxiety do you have?" The results are listed below.

<table>
<thead>
<tr>
<th>Date</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st (March)</td>
<td>&quot;Will it be postponed?&quot; &quot;Will it be cancelled?&quot;</td>
</tr>
<tr>
<td>2nd (May)</td>
<td>&quot;Will it be cancelled?&quot; &quot;It's not a good time for the Olympic Games.&quot;</td>
</tr>
<tr>
<td>3rd (July)</td>
<td>&quot;Will it be really held?&quot;</td>
</tr>
<tr>
<td>4th (Sept. and Oct.)</td>
<td>&quot;There is a possibility that the Olympics will not be held.&quot; &quot;The IOC President said that the Olympics will be held, so I am less worried than last time.&quot;</td>
</tr>
<tr>
<td>5th (Nov.)</td>
<td>&quot;The world is currently not in a position to hold the Olympics.&quot; &quot;Another outbreak will spread and it may be cancelled.&quot;</td>
</tr>
<tr>
<td>6th (Jan.)</td>
<td>&quot;Various people comment on the Olympics in the news coverage about COVID-19 every day, and that makes me anxious.&quot; &quot;The news programs may swing public opinion toward the cancellation.&quot; &quot;If I win in the Olympics, will I still be criticized then?&quot;</td>
</tr>
<tr>
<td>7th (March)</td>
<td>&quot;Will the Olympics be really held?&quot; and &quot;Is it okay that the Olympics will happen while there is an unwelcome atmosphere in the society due to the COVID-19 situation?&quot; *Anxiety about the postponement/cancellation possibility and advisability of the Olympics.</td>
</tr>
</tbody>
</table>

The athletes responded as "with anxiety" were asked the following questions: "Have you been able to overcome the anxiety?" If so, how do you usually overcome the anxiety? The results are listed below.

<table>
<thead>
<tr>
<th>Date</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st (March)</td>
<td>&quot;I continue training believing that the Olympics will be held definitely,&quot; &quot;I just think I can handle the anxiety.&quot;</td>
</tr>
<tr>
<td></td>
<td>→ 3 athletes have not been able to overcome: &quot;feeling down&quot; &quot;feel unfocused&quot;</td>
</tr>
<tr>
<td>2nd (May)</td>
<td>&quot;I believe the Olympics will be held definitely.&quot; &quot;I'm doing what I can do to turn off my anxiety.&quot;</td>
</tr>
<tr>
<td></td>
<td>→ All the respondents have been able to overcome the anxiety.</td>
</tr>
<tr>
<td>3rd (July)</td>
<td>&quot;I try not to let my feelings affect me&quot; and &quot;I try not to think about it during practice, but when I’m alone, I cannot help thinking about it.&quot;</td>
</tr>
<tr>
<td></td>
<td>→ 1 respondent stated, “I try to ‘forget’ about the anxiety for training, and toward competitions, but I may not have been able to overcome it.</td>
</tr>
<tr>
<td>4th (Sept.)</td>
<td>&quot;I'm practicing just as usual.&quot; “The anxious feelings are distracted by practice.” “Whether the Olympics will be held or not is beyond my control, so I just continue doing what I can do at the time.”</td>
</tr>
<tr>
<td></td>
<td>→ All have been able to overcome.</td>
</tr>
<tr>
<td>5th (Nov.)</td>
<td>&quot;I try not to think about the anxiety.&quot; “All I can do is just to practice.”</td>
</tr>
<tr>
<td></td>
<td>→ 1 respondent stated that he/she can never overcome the anxiety.</td>
</tr>
<tr>
<td>6th (Jan.)</td>
<td>&quot;I don't care,&quot; &quot;I have to accept the anxiety.&quot; &quot;I have to fool myself.&quot; &quot;I have no other choice but to practice.&quot;</td>
</tr>
<tr>
<td></td>
<td>→ I said, &quot;I can’t overcome the anxiety until the Olympics are determined to be held with commitment.&quot; → Combined with the lack of mat practice, the anxiety has lowered my motivation.</td>
</tr>
</tbody>
</table>
| 7th (March)| "I'm focused on overcoming the anxiety because the tournament is coming up and I know I'm going to
join there."

→ 1 respondent reported that he/she had not overcome, "Is it okay to keep practicing under the current COVID-19 circumstances?"

Athletes who responded as "without anxiety" were asked: "Why do you have no anxiety?" and the results are listed below.

<table>
<thead>
<tr>
<th>Date</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st (March)</td>
<td>&quot;I am sure no cancellation or postponement&quot; &quot;After all, we'll do whatever it takes.&quot;</td>
</tr>
<tr>
<td>2nd (May)</td>
<td>&quot;After all, I'll do whatever it takes.&quot; &quot;I think that the Olympics will happen.&quot;</td>
</tr>
<tr>
<td>3rd (July)</td>
<td>&quot;Being obsessed with the anxiety won't change things anyway.&quot; &quot;I can't control the worry by myself.&quot;</td>
</tr>
<tr>
<td>4th (Sept. and Oct.)</td>
<td>&quot;Because the Olympics are going to be held without spectators in a simplified manner&quot; &quot;It is what it is, if the competition won't take place.&quot;</td>
</tr>
<tr>
<td>5th (November)</td>
<td>&quot;I was relieved when President Bach came to Japan&quot; &quot;I just prepare assuming that the Olympics are going to happen.&quot; &quot;It's no use being obsessed with the anxiety.&quot;</td>
</tr>
<tr>
<td>6th (January)</td>
<td>&quot;There is information out there about the specific vision and measures for the Olympics to be held.&quot; &quot;It's now decided that Olympics will happen.&quot; &quot;the Olympics aren't everything, even if it won't be held, it's not the end of life.&quot;</td>
</tr>
<tr>
<td>7th (March)</td>
<td>&quot;Because the Olympics are going to happen,&quot; &quot;Because the Games are coming soon.&quot; &quot;The Olympics seems to be held anyhow and every how.&quot;</td>
</tr>
</tbody>
</table>

2.3.2. Changes in motivation

From the first survey in March 2020 to the sixth in January 2021, some athletes’ responses out of all indicated a constant ‘decline in motivation.’ (Fig.2)

However, overall, the responses as "not-decreased motivation" became the majority after a significant drop before and after the postponement decision in the early days of COVID-19 situation.
Fig 2. Trend chart of Motivation

2.3.3. Emotions when imagining if the Olympics were cancelled

Amid the ongoing spread of the COVID-19 outbreak, the Japanese government and the Organizing Committee held the opening ceremony of the Tokyo Olympic Games on July 23, 2021, with no spectators. Although after all the event was almost pushed forward to take place, with the debate about cancellation and protests aroused, the process leading to the event was extremely difficult. The event was an unusual case in terms of that the discussions about canceling the event had been active until the day just before the event, and the cancellation of the event was remained as an option throughout the event period. In the process leading up to the event, we asked the athlete a question: “What would you think if the event was cancelled?” (Fig.3)

Fig.3 Emotional change when imagining the case of the Olympics cancellation
3. ANALYSIS AND DISCUSSION BASED ON RESULTS

3.1. Anxiety

Many top athletes scheduled to compete in the Olympics were anxious about whether the Olympics would be held or not and whether it would be held in normal form. It was also observed that the only common way to overcome their anxiety was believing that “the Tokyo Olympic Games will happen,” and the way is practically the technique of “Thought-stopping.” There were also the athletes who responded as “without anxiety,” but basis or reason for the state was quite obscure. They seemed to be in a state with “Thought-stopping” similarly to the athletes who reported that they had been with anxiety, but had overcome it. In a sense, Olympians had no choice but to take the technique, “Thought-stopping.” In other words, the survey results revealed that top athletes tend to think that they cannot do anything fundamentally to turn off their anxiety or despair which arise when encountering “difficulties that cannot be solved by their own efforts,” upon the time such as COVID-19 situation. There are the possible reasons for this tendency: the situation is unpredictable due to the precedent nature of the situation, existing solutions do not work, athletes themselves have difficulty in self-care, and people around them also do not know how to support them.

3.2. Discussion of two "Thought-stopping" patterns and necessary mental care for athletes

Usually, the goal cannot be realized despite repeated thought and action. When internal factors have stronger power than external factors, it is often the case that athletes tend to get in the state of “Thought-stopping.” In this situation, mental care, mental training, or counseling are supposed to be effective. However, regarding the situation that cannot be controlled by one's own thoughts or actions, when we settle down in the state of “Thought-stopping” in such situation where external factors have stronger power than internal factors, it seems that the appropriate responses or actions have not been defined yet. Let’s take the “absolute difficulties (explained in detail in the latter part)” discussed below as examples.

3.2. A discussion of the major differences between the normal athlete and top athletes

Next, we discuss the differences between the normal athlete and top athletes. For the normal athlete, competition is just one part of life, and there are rich environments for them where mental training and counseling for the general public can be effective and supportive. In contrast, top athletes have no environment to rely on for psychological anxiety particular to them, such as the loss of the Olympics, which they have aimed desperately, devoting their own lives to it.

3.3. Motivation

From the first survey in March 2020 to the sixth survey in January 2021, athletes indicated a constant "decline in motivation". Overall, However, the athletes with "not-declined motivation" were the majority after a significant decline in motivation in the period around the initial decision to postpone the Corona disaster.

This is because of a number of factors, but it can be inferred that it is largely influenced by media coverages concerning; (1) Getting used to self-quarantined life under COVID-19 pandemic, (2) Resignation that their own worries will not solve anything, and (3) Expectations for the spread of vaccines.

3.4. Emotional change when imagining if the Olympics were cancelled

Here are the results and discussion about the question: “How would you feel as an athlete if the Olympics were cancelled?” The result shows the tendency that the percentage of "there is no choice" increased as they got closer to the Olympics. The percentage tripled in a year from March 2020. We consider that this “there is no choice" response means ‘giving up’ facing circumstances beyond individual’s control or his or her own efforts. It is also defined that the “there is no choice” is a previous step to active rehabilitation regarding injured athletes and “there is no choice” is considered to be a necessary factor for moving on. It is said that the injured athlete eventually accepts the reality of the injury through the expression of emotional pessimism and gradual reduction of psychological stress following the stages: denial, anger, bargaining, and depression. This promote his or her commitment to rehabilitation and leads to early recovery from injury and return to competition. [3] The survey results show similar psychological changes,
including denial (the Olympics will not be canceled), bargaining (they wanted that the Olympics would be held even if there would be no spectators), and depression (decreased motivation). These results suggest that, this time, the athletes' final "acceptance" was not an acceptance of facing reality openly, but rather acceptance as resignation.

Therefore, we believe that care that assist athletes’ “acceptance with which they can move on and find motivation for the next action,” is necessary, rather than just ‘acceptance as giving up.’

4. PROPOSAL FOR ATHLETE TERMINAL CARE AND SPORTS CHAPLAINS

4.1. Absolute Difficulty

As a premise of the proposal, the particular situation of "absolute difficulty" is envisioned, and it works as a factor that prevents athletes from accepting “the end of career as an athlete.” As mentioned above, this refers to a state in which external factors have stronger power than internal factors, and as a result, the athletes settle down in a state of “Thought-stopping.” Looking back the latest example of “absolute difficulty,” there was a special situation due to COVID-19 pandemic. It is the relevant fact that wrestling is an individual sport, where mental health issues are more common than in team sports [4][5]. Also, the fact that Olympics are the biggest event for amateur sports is considered to have an influential power. Thus, we define “absolute difficulty” as a situation in which there are several things beyond one's control or one's own efforts. We believe that the methodology can be utilized to support athletes in occasions: the possibility of cancellation of the big games such as Tokyo Olympics, and even for retirement timing from competitions. As a response to the need of a system to care athletes facing “absolute difficulty,” we propose Athlete Terminal Care and Sports Chaplains.

4.2. Sports Chaplain

We would focus on the concept and skills of terminal care, which is adopted in the field of end-of-life care as mental care that should be provided by a coach, when top athletes face "absolute difficulties" and fall into a situation of despair that cannot be overcome. Terminal care is medical and nursing care employed in hospitals for end-of-life care to the patients who have only the limited days to live. Rather than providing a "treatment," the goal is to help a patient understand and accept one's life expectancy and to alleviate pain, suffering, mental anguish, or stress. We utilize skills from Terminal Care not as a mental treatment for athletes, but as the ‘care’ to assist them to understand their playing career expectancy as an athlete and encourages their acceptance. In Europe and the United States, not only doctors but also chaplains (hospital chaplains) and others join in terminal care. They engage in mental care for those who have experienced various types of loss, being there for them when they try to deal with their grief. “Sports Chaplain” is defined as one who provides athletes with terminal care in the field of Sports.

5. SUMMARY AND FUTURE WORK

“Death” for top athletes is nothing but losing the opportunity to compete. As mentioned above, top athletes who compete in the Olympic Games devote their entire life to competition, and it is no exaggeration to say that competition is their life itself. Losing the opportunity to compete means losing their life. Furthermore, athlete career does not last a lifetime. It will eventually come to an end. It is not easy to adapt to these changes, as they occur in exactly the reverse order of the natural course of life as human being. However, we believe that, without acceptance of these changes, it is impossible for athletes to set new goals or to pursue a second career. When an athlete’s career comes to an end for some reason, the coach needs to play a role in acknowledging who the athlete is being and what he/she is doing, and then telling the athlete about the end. Regarding the current state of mental health care for athletes in Japan, there have been a lot of discussions in recent years about support measures for athletes in developed countries globally. 2021 was the first year [6] when athlete’s mental health issues in Japan including the cases that require expert support were reported in an international journal, and it must be said that Japan is lagging behind in the field of athletes’ mental health care. This time, we conducted an interview survey targeting national wrestling team candidates ("12 men and 5 women" (4 women from the third round)) and, from March 2020 to March 2021, while which spread of COVID-19 infection started and the one-year postponement of the Tokyo Olympic Games was announced. Based on the results, we proposed "athlete terminal care & sports chaplains."
Currently, the problem of Russia's invasion of Ukraine and viral infections such as monkeypox is also expanding around the world. To go with the times, new ways to support top athletes under “absolutely difficult circumstances” should be considered.

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Small Retail Stores That Promote And Lose Brands
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ABSTRACT

Independent retail stores have come under increasing pressure from national chains to survive in the market place. After much effort has been made to promote brands that are only sold in smaller retail stores, the companies associated with the brands are continuously trying to increase revenue by selling to new customers. The allure of a national chain to carry a brand sometimes overrides the loyalty of the small retailers who helped build the brand.

The researchers will conduct a survey to a very small part of the independent retail market, upscale independent men’s stores, to begin a discussion on ways that an independent store can survive when brands they help build are sold in stores with less customer service, and hence, lower augmented cost to the store. The survey will try to find strategies that small independent retail stores can use to succeed in an environment where they compete against national chains. There are several assumptions that will be discussed:

1. Small retail stores cannot compete on price with national chains.
   Small local retailers have an advantage over national chains because customer loyalty means that consumers are willing to pay a higher price for the product.

2. Small retail stores cannot compete with the same brands as national chains.
   There is a need for different brands for small businesses that excite the target market and differentiate their offerings from the brands that national competitors will offer in the marketplace. Development of proprietary brands has been shown to be successful for smaller companies competing in other industries.

3. The target market must appreciate and pay for increased customer service.
   Upscale independent retailers will pay a higher price for a product if the customer service in that store decreases the risk of that product.

4. Distributors must prove that they will limit distribution to other “like” upscale retail stores with no national presence.
   In the beginning, new companies with upscale products will limit distribution of their product. It is very rare that this limit will continue if the product is successful.

5. Distributors must have a long-term strategy to protect the brand’s “up scale” perception among the target consumers.

Distributors/manufacturers need to convince their retail store customers that they will begin a long-term partnership with the retail store that will be profitable for both over a long period of time. They must present an image of credibility and trust, significant elements in relaying this to their retail costumers, which must be managed and communicated to maintain the firm's corporate image and reputation.
Research On Digital Reproduction
Of Lost Technologies

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ABSTRACT

Many digital and physical tools in circulation today are digitized versions of analog content and tools distributed in some past generations. Well-known examples include software-based reproductions of DJs using analog records and software and applications that reproduce analog synthesizers. Two possible reasons for the emergence of such products and services are as follows.

(1) They evoke nostalgia among those who remember the past.
(2) They evoke a sense of “freshness” among those who do not know the past.

Technologies and cultures that existed in the past but have been forgotten over time and have not been handed down to the present and those technologies and expressions that have not been preserved are called “lost technology”. In general, lost technology is often introduced as “mysteries of ancient history,” such as amazing technologies discovered at ancient ruins that have not been handed down to the present. However, many lost technologies existed in a much closer and shorter period. For example, it is well known that the space suits worn by NASA astronauts were created 40 years ago and are still technically difficult to reproduce and mass produce today, making them lost technology.

Lost technology has a history of becoming lost technology, including cases where it has declined due to the development of other technologies, and cases where traditions have been broken off due to the lack of inheritance of technology. There are various reasons why such old devices and technologies are attracting attention again, but they are not uncommon. In addition, technologies and devices that are rarely used, rarely seen, or unseen today are often put to good use once again. In some cases, lost technology is resurrected to contribute to entertainment or business, while in other cases it becomes the basis for new inventions. This shows that lost technology is not simply something that is old and hard to use, or inferior to modern things. People have no choice but to learn from the past and create new things from it. However, it is difficult for people today, who take for granted the technology that exists today, to cut out and utilize the technology of the past. This is because modern people have little time and opportunity to find and reconsider past technologies. Therefore, we are considering the excavation of lost technology and a system to drive and assist this excavation.

The authors have been trying to excavate lost technologies and reproduce them by digitizing them as follows.

- E-book system that can express deterioration and stain of paper
- E-book interface system using physical contact with paper Disposable camera applications that can only take as many pictures as there are sheets of film.
- The mobile interface replicates the feel of using a future phone on a smartphone
- 19th-century pre-cinema imaging device applications
- Digital applications for music cassette tapes that reflect the characteristics of sound degradation

The discovery and revisiting of historical technologies and cultures that have been forgotten and whose technology and appeal have not been transmitted to the present can lead to new developments and innovations in today’s technology and expression. The authors believe that the expression and techniques of analog content and tools, as well as the sensations associated with them, are particularly meaningful. We are engaged in various research and application developments to fulfill the meaning and value of these contents and tools. This paper introduces these attempts and explains their significance today as an attempt to uncover lost technologies and reproduce them through digitization.

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Research For The Characters
And Their Appearance Features
Associated With Music

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ABSTRACT

Currently, background music is introduced to many video works such as movies and TV dramas. By using different music depending on each scene or character, the atmosphere or emotions of the characters are expressed more affectively. Although background music used for the visual works does not directly indicate the information in the video like sound effects, the types of background music given to the scene that brings a particular feeling or impression to the audience seems to have some common points. In addition to strengthening the impression of each scene, when the same background music is consistently used for every scene in which a particular character appears, it can make the character's traits and behavior more distinctive.

Focusing on this, this study investigates the relationship between auditory information obtained from music and the image of a character's appearance features brought by that music.

The purpose of the study is to examine whether listening to music can lead to an image of the character appearance and whether the image of human appearance is common to many people.

Today, when music generally reminds us of a particular character image, it seems to be because that the character's appearance and movements were once recognized and remembered as visual information while listening to a certain background music. Therefore, it is necessary to make sure that it is possible to imagine a clear character appearance just by listening to music, and that the image can be shared among the people who listen to music. Also, if we assume that music can be represented as a character by converting the music elements into the character's appearance features, it is predicted that each element: musical instrument, tempo, pitch, sound constituting the music, acts individually on each feature of the character appearance. In the future, in order to embody their relationship, we would like to propose a system that generates avatars whose appearance alters according to changes in music.

As a first step, based on the assumption that music can remind people of a certain character appearance with a certain common features, we conducted a questionnaire survey about what kind of characters, especially their features, could be recalled, after listening to four pieces of music. The respondents were required to answer about the gender, age group, skin color, hairstyle, hair color, height, physique and other appearance features of the character, who is associated with the music.

The results show that music evokes common images among many people regarding different features. However, it was not possible to determine which elements of music lead to the association of which appearance features. Accordingly, as a future work, we would like to discover the detail of the relationship between auditory information obtained from music and the character's appearance features by conducting another segmentalized questionnaire by changing or breaking down the elements of music.
1. Introduction

1.1 Background Music

Currently, background music is introduced to most of the visual works represented by movies and TV dramas. Different pieces of music are used depending on each scene and character; the atmosphere and feelings of the characters at the time, to express them more emotionally.

Music used as background music in video works is not a clear and direct representation of in-universe information of the videos like sound effects. Nevertheless, the background music pieces given to scenes that bring specific emotions and impressions to audiences, such as touching scenes, entertaining scenes, and scary scenes, seem to be somewhat similar each other.

Not only amplifying the characteristics of existing visual information, music has the effect of manipulating information and impressions that people receive from specific objects to some extent.

In fact, in visual works, specific music is often used as background music in every scene in which a specific character appears. Consequently, the personality or behavior of the character can give more distinctive impression.

However, it is still difficult to express the character’s appearance features and movements, which audience usually receive as visual information, through music. Therefore, in this study, we decided to investigate how each element such as pitch, tempo, and tone of the sound that constitutes the music, work, in respect of imaging the characters’ appearance.

In the future, we would like to propose a system to generate avatars whose appearance changes with changes in music based on the relationship between the auditory information obtained from music and the appearance features.

By clarifying the appearance features of the characters expressed by the elements of music, the production and selection of background music pieces for the visual work would be easier, and it will be also possible that background music pieces can bring more distinctive impression to people. Furthermore, we believe that the music itself will be able to convey a specific image, not in the form of a combination with visual information.

1.2 Purpose

The purpose of this study is to examine whether listening to music can have a common image of human appearance.

Today, when music generally reminds us of a particular character image, it seems to be because that the character's appearance and movements were once recognized and remembered as visual information while listening to a certain background music. The reason for associating a certain music with a certain character is thought to be because the audience received visual and auditory information at the same time. Therefore, it is necessary to check whether it is possible for people to imagine a clear human appearance just by listening to music without any visual information, and whether the common image can be brought to people’s minds.

To construct a system for generating avatars whose appearance changes with music in the future, it is necessary to clarify the relationship between auditory information brought about by music and the character’s appearance features.

Therefore, as a first step, we thought we are in need of investigation about how clear the appearance features can be imagined from music and whether the images associated with music have something in common.

2. Survey

We assumed that music reminds us of character with certain common images. Respondents were asked to answer a questionnaire about what kind of character, especially what kind of their appearance features were recalled, after listening to the music played as a sample.
For one piece of music, eight questionnaire items were set. The respondents were asked to select gender (male/female), age group (child/adolescent/old), skin color (bright/medium/dark) hair style (long/short), height (short/average/high), and body shape (skinny/slim/normal/muscular/obese). In addition to these multi-choice items, the respondents were asked to describe the hair color and other appearance features. If listening to music gives you a common image, the results of this questionnaire will clarify the appearance of the person the subjects imagined.

The music pieces adopted as samples this time are all used as background music for actual movies. However, separated from the contents of the movies or the characters, the respondents were asked to answer about the characters’ appearance features associated from the sample music pieces that they had listened to.

If the answers to each question item have a certain tendency, it means that common image is obtained from music. Furthermore, if the results show there are differences in the tendency depending on each music or if the question in which a particular tendency is observed differs depending on each music, it means that each element constituting the music acts on the recollection of a different appearance features.

2.1 Music 1

The first music is the main theme of the movie, "E.T."

The results show that there is a certain tendency regarding four items except gender, hairstyle, and height. In particular, about 80% of the respondents chose ‘white’ for skin color and ‘normal’ for body shape. In regards to age group and hair color, the respondents did not concentrate on one of the pre-prepared choices, in the form of comprising about 80%, but focusing on other information, we found that the images brought up had some tendencies.

As for age group, there were no respondents who selected ‘old age.’ Although responses were either of ‘children’ or ‘adolescents,’ it is thought to be an image of a person in his or her 10s to early 20s. Because a respondent, who chose ‘adolescent,’ wrote “teenagers” as supplementary comment in free description area, and a respondent, who chose ‘children’ described it in detail as "age grown up enough to go out alone, not infants." Regarding hair color, there were a respondent, who selected ‘brown,’ and added "bright brown" and another added "brown close to gold." Considering that the response rate of ‘gold' was more than 50%, it can be said that they tend to have the image of bright hair color in common.

The results indicate that music 1 reminds people of ‘young man/woman with fair skin in normal body shape.”
Figure 1: Music 1 Survey Results
2.2 Music 2

Figure 2: Music 2 Survey Results

Music 2 is "The Demon God" from the movie "Princess Mononoke ."

As for music 2, there are tendencies in the answers regarding six question items except for body shape. In particular, gender, age group, hairstyle and hair color have noticeable trends, about 70 percent of the respondents concentrated on one option. Regarding height, responses were separated basically to two types, and none of the respondents answered ‘short,’ and it means that they did not get the impression of something small.

As for the skin color, some respondents selected ‘medium,’ but one of the respondents added “sunburned” as a comment. Considering that more than 50% of the respondents selected ‘dark,’ the imaged skin color is rather dark. In addition, other features related to appearance were described such as a “tough-looking” and “thick eyebrows.”

The results indicate that music 2 is associated with elder man, who is with dark skin and hair and taller than average height.
2.3 Music 3

Music 3 “The Great Escape March” from the movie “The Great Escape”

![Survey Results Graphs]

Regarding music 3, the answers to all questions are distributed with tendencies. In particular, the tendencies regarding ‘age group,’ ‘hairstyle’ and ‘height’ are noticeable, and about 90% to 100% of the responses were collected for one option.

Focusing on ‘hair color’ and ‘body shape,’ the answers seem to be spread in distribution as a glance. However, there was a supplementary comment: “brown close to gold” while choosing ‘brown,’ in the same way as music 1, and some respondents chose ‘slim’ for body shape and added "childish thin legs and arms.” From this, it is judged that there are also response trends regarding ‘hair color’ and ‘body shape.’

The results indicate that the person associated with music 3 is a ‘boy with fair skin in normal body shape.’
2.4 Music 4

Music 4 is “One Summer’s Day” from the movie “Spirited Away”

As for music 4, it is judged the associated image can be limited to a certain scope in terms of gender, age group, hairstyle and body shape. In particular, in contrast to music 1 and 2, about 90% of the respondents answered that the associated image was ‘woman.’ As for the body type, there were three types of answers, and since there were no respondents who chose ‘obese’ or ‘muscular.’ Therefore, it can be seen that the image of the body does not look robust. Under the two categories of ‘hair color’ and ‘height,’ answers are spread in distribution and there are no particular trends, and we cannot say that we have common images. However, from the items on which the trends have been observed, it can be thought that the image from the music 4 is a long-haired, elderly woman, and the character’s appearance can be narrowed down to a certain scope.

For each piece of music, there were distinguishing appearance features of the character whom the common image was given. From this, it can be said that listening to music can evoke a common image of character appearance. Since the items for which the answers about the image has certain tendencies, are different depending on each music, and the distribution trends of the answers are very different, it is thought that there is a certain appearance feature that is connected to each element of the music.

3. Summary

3.1 Conclusion

The survey of this research indicated two facts: even when there is no visual information such as images, people can associate music with a character, and the appearance features imaged from the same music have some common tendencies among people.
Also, depending on each piece of music, there was a big difference in the question items that have tendencies in the answers, and the answers to each questionnaire item also much different having certain tendencies. Therefore, the elements that make up the music (instruments, tempo, pitch, sound) are thought to be acting on the image of different appearance-related features (gender, age group, skin color, hairstyle, hair color, height, and body shape).

However, we have not determined which element of the music works for which appearance features’ images yet. Only with the trends shown in the survey results, it is difficult to make it easy to produce and select pieces of background music to be used for video works, and it is also hard to make music convey specific images to people without visual information.

It is essential to clarify the connection between each element and each feature, also in order to generate avatars that actually change with music and clearly embody the relationship between auditory information and appearance features.

### 3.2 Future Work

Not just to clarify the impressions from music and associated appearance features brought by that, but also to clarify the individual relationship between each music element and each appearance feature, it is necessary to conduct more detailed questionnaire survey basically in the same way as this time.

Specifically, the questionnaire will be conducted with the increased number of sample songs, by changing the elements (tempo, pitch, sound) of the music, including the question about which sound played by each instrument used to play the music leads to the impression of which appearance feature. If it is clarified which music element works for the image of which appearance features, it means that the characteristics of the person expressed by the music can be defined clearer. To put it the other way around, it is thought that it will be possible to make people associate music with a particular character.

Furthermore, the relationship can be utilized to simplify the production and selection of background music used for video works and to share images under situations where visual information transmission is not possible.

Based on the results obtained from these surveys, we would like to propose a system for embodying what the relationship implies and generating avatars whose appearance changes with changes in music. By clearly visualizing the relationship between auditory information and character appearance features as “avatar generation,” it becomes possible to express music as a character.

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Research On Supporting Application For Designing Corporate Brand Story Enabling Japanese Companies To Create Emotional Values With "Utagokoro"

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ABSTRACT

Brand Story is gaining attention as content that demonstrates the "emotional value" of a company, that is, the uniqueness of its brand. What is important for a brand to grow is to let people of all races and cultures understand the appeal and uniqueness of the company’s brand. In recent years, an increasing number of companies in Japan have introduced brand story as a part of branding, but it is noticeable that many companies have not been able to utilize it in the fullest sense, due to their unclear recognition of "emotional value,” which is essential in building brand story.

In this research, we redefine "emotional value," which is considered the most important element in building a brand story, by relating it to "Utagokoro," cultural sense that is quite familiar to Japanese people, and study it for the development of applications to enable Japanese companies to create brand stories.

Keywords: Brand Story, Emotional value, Jō-cho, Utagokoro, Company History, Visualization

1. Introduction

1.1 Background

These days with saturated products and services, commoditization is a situation in which there is no longer any significant difference in the substantial value produced by companies and no differentiation other than price is possible.

To prevent commoditization in the diversified markets of recent years, companies need to provide consumers with added value other than substantial value. Companies are expected to compete among themselves on elements other than price regarding the sale of products or services, i.e., to find elements that differentiate them from competitors in the form of non-price competition. As one of the elements, the creation of “emotional value” attracts attention. Japanese manufacturing, such as precision instruments, video games, and animation, is highly acclaimed internationally. Since the 1980s, through the world, the label "Made in Japan" has been regarded as an additional value that guarantees high reliability and quality of the products made by the Japanese people. On the other hand, there are many cases where Japanese companies with high-tech products or services, do not have sufficient brand power despite of the technology and quality that they offer. In fact, many Japan's top companies get in the lower in global corporate brand rankings, unlike the rankings for their sales or technological strengths. The reason for this reality is that Japanese people and Japanese companies are good at increasing substantial value (technological strength), but not so good at increasing “emotional value.”

There is a method and concept for creating emotional value called “Brand Story”. "Brand Story” is a creative piece that emotionally expresses the added value of the brand, such as its worldview and appeal, and is the best content for demonstrating emotional value to stakeholders. In other words, we believe that branding using the brand story is important for companies to spread their uniqueness and win in non-price competition. Recently, an increasing number
of Japanese companies have started to put the method of brand story into practice, but in many cases, they do not understand the difference between the ‘Brand Story’ and the ‘history of the company,’ or “Brand Story as a method for creating emotional value.” As a result, they have not effectively visualized and utilized the brand story as a marketing tool.

In this study, we focus on the visualization and utilization of emotional value for Japanese companies, and define 'new standard of emotional value' related to "Utagokoro," a cultural sense that is quite close to Japanese people. Then, we will redefine the “Brand Story,” and develop and propose an application to support the brand story creation for companies that are not good at creating emotional value. Unlike natural talent, "Utagokoro" refers to the sensibility, or sense formed by one’s life, experiences and efforts in line with the traditional Japanese art of content creation. We think that "Utagokoro" is the key element, which is essential to the brand story creation in Japan.

1.2 Purpose

This research aims to enable Japanese companies to visualize and utilize the brand story as a marketing tool in a pragmatic way, utilizing the traditional Japanese cultural sense, taking a cue from concept of "Utagokoro." Accordingly, the other objective is to stimulate new demand not only in the domestic market but also in overseas markets by improving the brand power of Japanese companies. One of the principal weaknesses for Japanese companies to expand globally is that they are not good at expressing their brands’ attractiveness. This is due to the nature of Japanese as a high-context language. ‘High-context’ is a concept proposed by the American cultural anthropologist Edward T. Hall in 1976, upon his book "Beyond Culture," and the term describes the characteristics of a certain communication style in a country or region. Upon high-context languages, communication is highly dependent on culture, values, environment, therefore, when communicating something to others, there are few verbal explanations, and feeling nuances and reading between the lines are required. However, what is important for a brand to be known and grown by a large number of people is to make sure that people of all races and cultures understand the brand’s appeal and uniqueness of the company. In other words, clarifying the mechanism for building brand stories proposed in this study is expected to solve the problems that many Japanese companies face and lead to their further progress in the international market.

2. What is Brand Story?

2.1 Concept of Brand Story

A brand story is a creative piece that emotionally expresses the added value of the brand, such as its worldview and appeal, and is also the most important tool to make stakeholders feel the brand’s emotional value. Stakeholders are interested parties who are directly or indirectly affected by the management of a company. Specifically, consumers, employees, shareholders, business partners, local communities, government agencies, and etc. The term is said to be derived from the English words, “stake” and “holder”, and was originally used in the book "Strategic Management: A Stakeholder Approach" by the philosopher, R. Edward Freeman, in 1984. What differentiates this concept from the typical writing that conceptualizes the essence of the brand is that it is not a text that explains facts and history in a straightforward manner, but a story with emotional elements which resonate with the recipient in the way that they can have room to understand and empathize with it. The brand story content can vary widely depending on each company, including the owner's history, thoughts, specialty points, and vision leading up to the start of the business, but it should always include the personal experience of the storyteller (founder, manager, and etc.). This is expected to create a strong trust, going beyond a mere relationship between a company and its stakeholders to a deep connection between people who have shared a single experience. In addition, with the proliferation of the Internet and social media, it has become important to create a variety of contents to transmit the brand appeal, and guidelines are needed to ensure consistency in the brand image. By utilizing the brand story as a “guideline,” it is possible to convey the brand’s worldview and direction to stakeholders efficiently in unwavering way.

2.2 A Case of Brand Story in Japan

Koiwai Dairy Corporation has a brand story on its website. Besides the brand story, the website also has a section for corporate information, one of the included items is the history of the Koiwai Dairy Industry. Comparing the ‘brand story’ with the ‘history of the Koiwai Dairy Industry,’ the contents are almost the same, although there are differences
in the amount of information. In other words, it can be said that they do not distinguish the brand story and the history of the company. This example shows that Japanese people are not familiar with the brand story as a method for creating emotional value and that many Japanese companies do not make effective use of the brand story as a marketing tool.

3. What is Emotional Value?

3.1 What is 情緒 “Jō-cho”(Emotional)in Japan?

Emotional is expressed as 情緒 “Jō-cho” (Figure 1) in Japanese. Combining the kanji character情 ”Jō”, which means the movement of the heart, and the kanji character緒 ”cho”, which means the clue to things, it is written as情緒 “Jō-cho”. “Jō-cho” is (1) A subtle feeling that shakes the heart that comes from touching a certain thing, and (2) a unique atmosphere that generates these feelings. What people feel “Jō-cho” toward varies depending on their own cultural background and life experiences. In other words, the standard with which a person judge whether or not he/she feels “Jō-cho” toward a certain thing differs depending on age, gender, place where he/she grew up, and so on.

Figure 1: Explanation of “Jō-cho”

First, regarding (1), エモい “Emoi” (Figure 2) is a slang word that many Japanese young people use when they feel “Jō-cho” in everyday life. The word “Emoi” is said to have originated from “Emo,” a musical genre, a type of rock music with its origins in hardcore, characterized by melodic and emotional musicality and lyrics that describe sentimental feelings. It is also derived from the word "emotional," and has come to be widely used to describe emotionally charged situations or sentiments that cannot be expressed in a single word, and was derived from this to describe music that is passionate and moving as "Emoi".
There is also a theory that the word "Emoi" is derived from the Japanese word "得も言われぬ"Emoiwarenu," (Figure 3) which means "inexpressible" or "hard to describe". " emo" means "well" or "enough" and "言われぬ"iwarenu" means “cannot express it with my mouth.” In most of the case, it is used in praise of something beautiful, wonderful, or good. From the fact that the word is used to express a subtle feeling for which no suitable word can be found, "Emoi" is also considered as an abbreviation of "emoiwarenu."
Next, the unique atmosphere described in (2) can be essentialized in one brief word: “Exotic Atmosphere (or Janesquesque Atmosphere from Japanese point of view)”. An exotic atmosphere is a unique atmosphere created by a foreign country that differs from one's own country and a characteristic of a foreign country, such as a style or a foreign atmosphere. For example, in Japanese gardens, one senses the unique Japanese aesthetic of 侘び寂び “Wabi-sabi”, with which he/she can find simplicity, quietness, asymmetry, and marginality as the taste or the charm. 侘び寂び “Wabi-sabi” is used as a word to express “beauty,” but originally 侘び “wabi” meant ‘to be anxious’ or ‘to remind fleetingness,’ and 寂び “sabi” was a word accompanied by a negative image of ‘solitude.’ From the Ghibli film "Spirited Away," one of Japan's most famous movie works, one can feel 風情 “Fuzei” from every aspect, including the buildings depicted in the film, the scenery shown in the film, and the facial expressions of the characters. 風情 “Fuzei” is one of the aesthetic senses that have existed from time immemorial in Japan, expressing the beauty in the deterioration of objects brought about by nature over a long period of time, the scenery created by the four seasons of Japan, and “Fuzei” exists in things that are fleeting, simple, or empty. 風 “Fu” in “風情 "Fuzei” means the appearance of people and things, and 情 “Jō-cho” is the same meaning as used in 情緒 “Jō-cho”. An example of an artificially created exotic atmosphere is an attraction at Tokyo Disney Sea, the Venetian Gondola. It can be said that the restaurant beautifully reproduces the exotic atmosphere that Japanese people would feel when they visit Italy. Exotic atmosphere has different characteristics in the way how it is expressed depending on cultures and values, just as the exotic atmosphere created by Japanese aesthetics such as 侘び寂び “Wabi-sabi” and 風情 “Fuzei,” differs from the exotic atmosphere created by Italians. “Jō-cho” thus can indicate a variety of feelings or atmospheres, and there is no one and only definition. However, if we take a closer look at the Japanese traditions and cultural artworks that are based on Japanese society, we can see that “Jō-cho” is a sense for beauty and culture that is and always has been extremely familiar to Japanese people.

3.2 What is 歌心 “Utagokoro” (Poetry-Feeling)?

As mentioned in 3-1, 情緒 “Jō-cho” is a cultural sense that is quite familiar to Japanese people, which describes their aesthetic sense and cultural concepts. We discuss emotional values by relating “Jō-cho” to the cultural sense that is closest in meaning to 歌心 "Utagokoro". The concept of 歌心 "Utagokoro" (Figure 4) has long been used in Japan for literature and cultural activities. The Chinese character for 歌 "Uta" in 歌心 “Utagokoro” means ‘poetry,’ and the Chinese character for 心 “Gokoro” means ‘feeling.’
Unlike natural talent, "Utagokoro" refers to the sensibility or sense acquired by the one's life, experiences, and efforts, in the traditional Japanese art of content creation. We think that "Utagokoro" is a concept required to understand the Japanese sensibility based on Japanese culture and society, and is also an essential element for the brand story creation in Japan. It is a sensibility that everyone has, regardless of country or race. However, this sensibility naturally differs from culture to culture. In particular, we believe that the Japanese people are strongly influenced by a concept called "Utagokoro" as a sensibility. Many Japanese people will think of "Waka poetry" when they hear about the word "Utagokoro." However, even today, "Utagokoro" still influences everything that the Japanese people create day by day. For example, the songs written by Aimyon, a Japanese artist, who is popular among young people, are known for her depiction of delicacy and fragility. As mentioned earlier, "Utagokoro" is a sensibility that everyone has, and it is one of the most important elements in creating any content, not just waka poetry. In other words, if Japanese people become more aware of the "Utagokoro" within themselves, and if they can appeal the unique Japanese attractiveness that the "Utagokoro" brings out, it will lead to the future in which many Japanese companies can create brand stories that they can be proud of, targeting the world.

3.3 Concept of Emotional Value

In this study, we redefine 'emotional value' in relation to one of the most important elements in creating a brand story, "Utagokoro". Basically, the values that a company provides to its stakeholders can be divided into two types: substantial value and emotional value. Substantial value includes physical value such as price and quality of products or services, and functional value such as specifications. Emotional value, on the other hand, is a value that appeals to the heart by giving stakeholders something that cannot be quantified, such as 'experience' or 'impression.' For example, Apple's 1997 ad campaign used the slogan "Think different" as a springboard to spread Apple's corporate philosophy, rather than product information. With the return of Steve Jobs, each subsequent new product announcement attracted a great deal of attention, and the campaign became a successful case that remains in people's minds and hearts. ‘Emotional value’ to be redefined in this study is embodied by visualization of the founder's or employees' thoughts, specialty points, and accumulated experience through design and the brand story. Furthermore, by appealing to the Japanese people's "Utagokoro" sensibility, it can shake the memories and feelings of stakeholders, effectively.
4. Future Work and Conclusion

Future works are summarized in the following three points.

(1) Redefining the emotional value

Few existing studies have clearly defined ‘emotional value,’ which is an important keyword in this study. Therefore, it is necessary to redefine ‘emotional value,’ one of the most important elements in creating the brand story. At this stage, ‘emotional value’ is defined with regard to "Utagokoro," which includes delicacy unique to Japan. We will devise ways of expressing "Jō-cho" and "Utagokoro" so that not only Japanese people but also people around the world can understood them, after deepening our understanding of “waka poetry” and many other aspects of Japanese culture and aesthetic sensibilities.

(2) Redefining the brand story

In recent years, an increasing number of companies have adopted the brand story as part of their branding efforts. Nevertheless, because the perception of the brand story differs depending on each company and is ambiguous, challenges still remain in utilizing the brand story as a marketing tool. Therefore, this study will redefine the ‘brand story’ by clearly showing the mechanism of the brand story creation, and demonstrate that the brand story is effective for corporate branding.

(3) Design of the application

We will develop an application to support the brand story creation for companies that are not good at creating emotional values. Therefore, based on the analysis obtained from (1) and (2), we will extract specific elements to create the brand story and design the mechanism to produce the specific elements within the application.

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