Introduction

In this paper the data were collected after conducting the English language A level KPG (Kratikio Pistoriopitiko Glossomathias). National Foreign Language Exam System) test of May 2012 on 141 candidates. The test assesses the knowledge and skills leading to A1 Beginner level and A2 Elementary level of language. According to the KPG framework (Dendrinos & Karavas, 2013), in A1 level the candidate is expected to understand expressions which serve to satisfy communicative needs of everyday life. In level A2 testees are asked to understand expressions and sentences used very often as well as signs used in everyday practices.

Figure 1. Activity 1 of Reading Comprehension of KPG.

Purpose, Sample

The study evaluates the validity of this particular test via two different statistical methods which are the Principal Components Analysis and Implicative Statistical Analysis. These two methods are compared and the extent of validity of the exam is demonstrated.

The sample is composed of 141 Primary and Secondary School pupils of this language level who were asked to fill in the A level test during the academic year 2012–13. 101 out of 141 were Greek-speaking children and 40 were Turkish-speaking children of the Muslim minority of Greece.

Figure 2. Activity 2 of Reading Comprehension of KPG.

Methodology: Principal Components Analysis (PCA) and Implicative Statistical Analysis

Principal Components Analysis (PCA) is a symmetric method, which means that it is based on metric distances and thus the relations between the variables are essentially symmetric. The results of a PCA are usually discussed in terms of component scores and loadings. (Hair et al., 2005).

Implicative Statistical Analysis is a data analysis devoted to the extraction and the structuration of quasi-implications and was originally developed by Gras (Gras & Kuntz, 2008).

Results

4.1. PCA results

Activity 1: Sampling adequacy index KMO=0.564±0.60 and the sphericity Bartlett’s test (χ²=335.030, df=10, sign=0.001) showed that Principal components analysis was suitable. According to this analysis 1 factor results from data analysis, and it interprets 51.78% of total inertia. All the items’ loadings are over 0.40, a fact that confirms the quality of the test. The same holds for the other two activities.

4.2. Implicative Statistical Analysis Results

The similarities in the 1st Activity are significant. Their level of significance is 99%. Based on the specific diagram we can observe the following: in the similarity diagram) two distinct similarity subgroups are distinguished. The first subgroup A refers to similarity relations among variables (RC1.1, RC1.2, RC1.4) (Subgroup A), which deal with the matching of a statement with the right picture. This similarity of the variables of the first group shows that students handle the statements of RC1.1, RC1.2, RC1.4 about Tina, Helga and Liz in the same way. In the hierarchical diagram we can see the direction of the hierarchical relations among variables. The implications are significant in a level of importance of 99%. The first hierarchical group refers to RC1.2 and RC1.1 (cohesion: 0.634). Particularly, in hierarchy RC1.2-RC1.1 (cohesion: 0.634) the answer in item RC1.2 implies the answer in RC1.1. At this point it is worth mentioning that the hierarchy of RC1.2 and RC1.1 (cohesion: 0.634) is important.

Diagram 2. Similarity and Hierarchical diagram

Conclusion

The implementation of both methods demonstrated the validity of the test concerning activities 1, 2, 3. Comparing the two, PCA and Implicative Statistical Analysis we realize that we had the same grouping of the items of the three activities. Both methods confirmed the validity of the test.

References


Student Wellness: An Investigation in a Small Canadian Post-Secondary Institution

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Introduction
Mental health is a major priority on post-secondary campuses in Canada (CCMN, 2015; Ibrahim, Kelly, Adams, & Glazebrook, 2013; Mackean, 2011; Reavley & Jorm, 2010). The age at which most young people are in higher education is the age of peak onset for mental illnesses and substance use disorders (Reavley, & Jorm, 2010). More than 28% of individuals aged 20-29 experience a mental health illness in a given year (MHCC, 2013). The annual number of individuals living with a mental illness is highest among 20-30 year old adults, the ages that also have the highest rates of mood and anxiety disorders (MHCC, 2013).

Background Literature
Student wellness is a concern on post-secondary campuses; the prevalence of mental health issues is increasing among students (Hunt & Eisenberg, 2010; MHCC, 2013). There is a significant need to understand those impacts and how to manage their care and treatment on campus. The age at which most young people are in higher education is the age of peak onset for mental illnesses and substance use disorders (Reavley & Jorm, 2010). More than 28% of individuals aged 20-29 experience a mental health illness in a given year (MHCC, 2013), with mood and anxiety disorders being among the most common types of mental disorders in Canada and have been shown to have a major impact on the daily lives of affected persons (Government of Canada, 2015). Post-secondary education is a time when many individuals experience significant developmental changes, explore their identity, important life choices, and are faced with new and different types of stress. Stress remains the most frequently cited reason for negative impacts on academic performance (Versaasel, 2013). The most common of these stressors include: academic overload; pressure to succeed; competition among peers; financial burdens; concerns for the future; and relationship issues (Mackean, 2011; Versaasel, 2015). In fact, many post-secondary students often get stuck in the cycle of stress leading to lower academic performance and poor academics lead to enhanced levels of stress (Versaasel, 2015). Hence, excessive negative stress, or distress, hindering academic performance has been found to contribute to dropping out of educational programs (Versaasel, 2015).

Mental Health Services. Not surprisingly, more post-secondary students are coming into contact with campus health services, particularly counseling services (Rettz et al., 2016). Post-secondary counseling centres report that the prevalence of counseling requests are found to be highest, 3-4 weeks into the semester (Eisenberg et al., 2007). It is unclear whether these trends can be attributed to more health issues or to an increased willingness of students to seek help for mental health symptoms. Anxiety (50.6%) and depression (41.2%) are the most predominant mental health issues among post-secondary students seeking counseling services (Heck et al., 2014; Hunt & Eisenberg, 2010; Ibrahim et al., 2013; Reetz et al., 2016).

Physical Activity. Physical inactivity is a serious health issue among post-secondary students (Irwin, 2007). Research indicates transition to post-secondary studies is associated with increased physical and psychological health issues (Bry & Kwan, 2006). A Canadian study found that undergraduates experienced their lowest levels of well-being (e.g., perceived mental & physical health) upon entry to post-secondary institutions (Bry & Kwan, 2006). Physical activity levels were found to decrease significantly among 1st-year students compared to their previous high school physical activity levels (Bry & Kwan, 2006; Bry & Born, 2004; Kwan et al., 2009). This pattern of decreased physical activity persists through students’ post-secondary careers and beyond; 42% of students reported a decline in physical activity from high school to post-secondary studies (Bry & Born, 2004).

A study found that students who engage in high levels of physical activity showed significantly lower levels of anxiety and depression than the medium and low physical activity groups (Tyson et al., 2010). Regular physical activity can improve mental health among people with serious mental health and improvements in quality of life and emotional well-being have been noted (Richardson et al., 2005).

Research Question
What is the current state of physical activity & mental health for post-secondary students?

Method
Participants
Although each student in the entire university was invited to participate in the research project via email, 212 students (representing 10% of the student body) voluntarily participated by completing an online survey. By reading an online introductory letter and clicking ‘I Consent’ in order to move onto the Response Section, participants were advised that completion of the survey meant that consent was provided.

Results
• 60.4% described their current levels of PA during the academic year as “somewhat active” or “rarely active”.
• 63.2% engage in 90 (or less) minutes of PA through a regular academic week; 16.5% engage in 151 (or more) minutes.
• 48.6% believe the amount of stress in their lives is either “quite stressful” or “extremely stressful”.
• 32.5% either “disagree” or “strongly disagree” that their ways of coping with stress are healthy.
• 24.5% have accessed mental health services on- or off-campus in the past 12 months.
• 29.7% have been diagnosed with a mental illness (e.g., anxiety, depression) by a Medical Doctor, Psychiatrist, or Psychologist.
• Self-reported levels of PA are positively correlated with mental health (r = .380), and with the likelihood of healthy coping strategies (r = .406).
• Self-reported PA levels are, conversely, negatively correlated with stress levels (r = -.258), and with the likelihood of unhealthy coping strategies (r = -.290).

Although we cannot determine the direction of the relationship, it seems that as PA levels increase, mental health scores also increase, stress levels decrease, and the use of healthy coping strategies increases, while the use of unhealthy coping strategies decreases.

All reported correlations are significant at the 0.01 level (2-tailed).

Participants
After receiving approval from the University’s Research Ethics Board, both quantitative and qualitative data from 212 post-secondary students from all faculties, and with varying post-secondary years of experience, were collected. 212 students from 10% of the student population were randomly selected from the Mailing List database. Of this group, there were 45 (21.2%) male respondents, 165 female respondents (77.8%), and 2 (0.9%) participants who identified as non-binary. The years of post-secondary experience ranged from 1-5 years.

Methods
For instrument, we provide some general demographic information, participants responded to 11 questions related to their perceived levels of physical activity (n=5) and mental health (n=6). For example, questions included:

• Part A: Physical Activity (PA)
• “I choose to be physically active during a regular university week because”...
• “My ways of coping are healthy (e.g., breathing exercises, meditation, exercise, etc.),”...
• “Are you engaged in physical activity for at least 60 minutes on most days of the week?”...

Conclusions
A large body of literature suggests that mental health issues are a real concern on post-secondary campuses. As hypothesized, the results indicated that physical activity positively impacts student mental health. However, many students reduce their physical activity levels during stressful times of the academic semester. Post-secondary institutions may wish to encourage physical activity as a positive stress reliever for students, especially during peak stress times when students may actually reduce or eliminate physical activity. Post-secondary institutions are well-positioned to promote mental health and wellness among its students, faculty, and staff members. Creating holistic, inclusive institutional policies targeting campus-wide mental health helps establish and nurture a supportive campus environment, which is a major contributor to student mental health and wellness.

Post-secondary students are struggling with emotional and behavioural health issues at higher rates than previous generations. (Koch, 2016)

Note
The Research Team would like to acknowledge that this project was partially funded through an Internal Research Grant from Concordia University of Edmonton. This research informed Concordia University of Edmonton’s Mental Health Strategy.
Meeting the Needs of the Foster Child: Perceptions of the K-6 Teacher

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Abstract
This current study sought to determine the perceptions of foster children by teacher participants.

Theoretical Framework
Bowlby worked to provide an empirical explanation that children need a continuous relationship with a caregiver to thrive emotionally (Bretherton 1992). “Early exposure to trauma may have detrimental effects on neurological organization” in children (as cited in Carlson 1992, 1123).

Participants and Method
The participants were thirty-six current teachers who completed a survey to provide their perceptions of foster children.

Results
- 86% believe that foster children are capable of forming positive attachments with peers with 89% believing that positive attachments are possible with teachers.
- 42% do not believe that foster children’s misbehavior should be tolerated in the classroom, but 45% believe that their lower academic achievement should be tolerated.
- 70% believe that foster children feel included in the classroom.
- 64% believe that foster children’s emotional needs are different than the needs of other children.

Conclusions
- Although many students across America are experiencing academic failure, the growing population of foster children are more likely to experience this failure (California Education Collaborative for Children in Foster Care 2008).
- Teacher perception plays an important role in students’ success (Vail 2005).
- Misconceptions can impact student success.
- This study has brought a heightened awareness of the teachers’ perceptions towards this growing population of students relative to the challenges facing foster children.
Organizational Improvement Plan: Addressing the Absence of Leadership Education and Preparation in the Early Year’s Curriculum

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Introduction
This research proposes an Organizational Improvement Plan (OIP) addressing the absence of leadership education and preparation in the early year’s curriculum.

Abstract
The purpose of the Organizational Improvement Plan is to incorporate leadership education and preparation in the early years curriculum. The Organizational Improvement Plan is in response to the social and political expectation that early childhood professionals act as influential leaders who have an important role in improving the quality of education, care, and services for children, families, and the community.

Background & Purpose
The Bachelor of Applied Science Early Childhood Studies program at the University of Guelph-Humber prepares students to work with children and families. At the end of four years, students graduate with a diploma in Early Childhood Education, an honours degree in Early Childhood Studies, and the eligibility to register with the College of Early Childhood Educators.

Traditionally, early childhood educators are recognized for (College of Early Childhood Educators 2016):
- Their role in assessing children’s developmental abilities and needs,
- Designing curriculum to address children’s development,
- Planning programs and environments for play, and
- Maintaining healthy social and emotional development for children

Recently, there is a growing body of research that demonstrates that early engagement with children and families leads to positive outcomes for the whole community (Rodd 2013). As a result, early childhood educators are now recognized by society and politicians as influential professionals and leaders who have an important role in improving the quality of education, care, and services for children, families, and the community (Rodd 2013). Early childhood educators are now being employed in multiple settings including elementary schools, hospitals, rehabilitation centers, and childhood grief support groups.

This increased recognition for the profession has created rapid change in the field of early childhood (Rodd 2013). “Change— a hallmark of contemporary society— impacts greatly on early childhood services, making leadership—which is a necessary condition for effective change— worthy of greater attention...” (Rodd 2013). Therefore, it is imperative that the absence of leadership education and preparation in the Early Childhood Studies curriculum be addressed.

Summary of Theoretical or Conceptual Frameworks:
Adopting a collegial model that values instructor knowledge and experience
- Instructors have relevant and current experiences in the field, that can be combined with their understanding about the objective of the institution, to revise and provide the best curriculum for the students.

Collegiality is a key aspect of instructor professional growth and development.
- Collegial communities create a cooperative environment that allows for shared learning and increases innovation and enthusiasm among faculty (as cited in Shah, 2012; as cited in Massy, Wilger, & Colbeck, 1994).

The professional growth that happens as a result of collegiality can support instructors to recognize the benefits of being heard, being a part of the decision-making process, and feeling valued.
- They exemplify transformational leadership skills such as, being aware of their effect on students, being attentive to student’s needs, supporting students in seeing different perspectives, and inspiring students to achieve their goals. They support students in developing their own self-awareness and model for students what it means to be a caring and supportive early childhood professional.

Practical Significance and Implications of Research
Richmond and Allison (2005) suggest there is a lack of mutual understanding of what leadership means and this lack of understanding limits a person’s ability to fulfill a leadership role. Similarly, Rodd (2013) suggests that an accepted definition of leadership for early childhood has yet to be developed. Consequently, the majority of early childhood educators are not comfortable with taking on a leadership role (Ebbeck & Waniganayake, 2003).

This OIP:
- Positions the program with the potential to start the discussion and process for defining this leadership role.
- The proposed curriculum prepares students to be multifaceted professionals who are adaptable and flexible because the world is continually evolving and so too will the field, the definition of leadership, and the role of an early childhood educator.

Summary
This OIP defines leadership as inspiring direction and change, developing quality relationships, and encouraging the best in oneself and others (Conger 1999; Kotter 1999; Brown 2001). Leadership development requires a process of self-awareness, of “finding your own voice”, and developing the ability to deal with diverse circumstances in an empathetic manner (Brown 2001, 3; Blackmore 2013).

Three recommendations have been made for revising the program curriculum:
I. Review and improve the program courses;
II. Design an interactive classroom; and
III. Develop a laboratory school.

Preparing students to be leaders in their field is important for all institutions and all programs. In order for programs to prepare students for their current and future role, all curriculums should teach the following skills:
- Judgment,
- Critical thinking, and
- Collaboration.

These skills will ensure students become flexible and adaptable professionals, ready to work in a continuously progressing world.

When reviewing and revising the program curriculum, consideration will be given to the following policies:
- Canada’s quality assurance process, and
- Program standards developed by the Ministry of Training for Early Childhood Education programs.
A Preschool Curriculum-Based Screening for Pre-Referral Support

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Introduction
Curriculum-based approaches for educational assessment and pre-referral support are continuously gaining attention as being more meaningful to school communities, than classic psychometric approaches (e.g., Cusumano, 2007). Thus, curriculum-based screening approaches provide a common ground for both educational and instructional decisions. Although focused on identifying difficulties in pupils' functionality, the present approach is clearly influenced by the Responsiveness to Intervention (RTI) notion. Consequently, the purpose of the present study was to examine preschoolers’ participation in curriculum-related activities, in order to screen pupils who could be eligible for individualized support before diagnosis. An authentic assessment pilot tool was designed and implemented. A tool, which will describe preschoolers participation in the five main axes of Greek pre-school curriculum.

Methods
In accordance with the Greek preschool curriculum, pupil’s participation is being evaluated in five core axes, namely play, explorations, class routines, daily situations, and learning. Teachers rated contents of these axes (in total, 40 items) using a six point rubric, which highlights six levels, combining pupil performance and teacher enrollment. Subsequently, teachers judged, if pupils were to be referred a) to a pre-referral intervention program, b) to an educational diagnosis process, or c) not to be referred at all.

Our convenience sample consisted from 160 pupils (70% boys and 30% girls), with a mid range of five and six years, who attended mainstream kindergartens in East Thessaloniki region. Half of the 160 pupils were already diagnosed. From the 80 remaining pupils, 40 were classified as needing pre-referral support, and the rest 40 pupils were students with no or negligible difficulties in school functioning, according to their teachers.

After using both Exploratory and Confirmatory Factor Analyses, all five Basic Competences Axes of the Curriculum were verified (Play, Routines, Daily Life Activities, Explorations, and Organized Activities in five learning areas, namely, Language, Mathematics, Natural Sciences, Arts and Physical Education).

Furthermore, five transverse, yet theory-driven, factors were emerged and confirmed. Their items stem from different competence axes. These factors were named as follows: 1) Developing Symbols, 2) Psycho-motor Explorations, 3) Verbal Expression, 4) Social Competence, and 5) Basic Play with Peers. All factors presented high internal consistencies (Cronbach’s Alpha ranged from .92 to .97).

Results
Since there was no previous experience with the developed tool, we conducted a Hierarchical Cluster Analysis, so that is possible to acquire an insight on how pre-school teachers responded to the items of the present screening instrument. The results of this action are shown in Figure 1.

Classification And Regression Tree (CART) analysis of the data revealed that teachers’ ratings could correctly predict pupils’ group membership. Depending on the group targeted, the prediction accuracy varied from 90% to 100%. Curriculum axes and items had different statistical significance to group predictions. In this analysis, already diagnosed pupils were not included, because we did not evaluate the form and the effectiveness of the interventions that pupils received, after diagnosis.

Figure 2 shows that Social Competence (F4), Organized Activities in five learning areas (A5) and the Total Score of the 40 items (T_Sum), are able to predict low risk pupils (N=40), pupils for pre-referral support (N=23) and pupils to be directly referred for diagnosis (N=17).

Brief discussion
In spite of some sample and research design restrictions, results reflected the high capabilities of the present screening tool. The use of additional activity and participation items, may further increase its precision. Its internal and external validity should be tested too.

References
Introduction. Whereas the rationale of curriculum is grounded on an appropriate set of values which reflect general approach to education, the conceptual framework revealing the possibilities to create value-driven educational curricula is introduced.

Abstract. To date, a generally accepted definition of curriculum is lacking due to individual conceptual positions of researchers. As a result, different perspectives as well as types of curriculum are highlighted. The agreement among researchers is that the rationale of curriculum must find balance between value-driven sources concerned with learner, society, and knowledge. These sources encompass cognitive, emotional, and spiritual dimensions of learning in a broader sense. Over the past few decades, the research has tended to focus on cognitive dimension of learning reflected outcome-based approaches to curriculum. Emphasizing learning as an key item of the educational process and the interplay between teacher and learner, the necessity for both emotionally-based and spiritually-based features of learning process arises. Few researchers have reported the possibilities of the integration and development of cognitive, emotional, and spiritual dimensions of learning across curriculum, but in religious education. Several attempts have been made to apply such possibilities to secular education.

Each of dimensions pursue their own values messages that must be orchestrated across curriculum. Significant challenges arise trying to convey value messages in curriculum’s implementation through educational environments. However, little attention has been paid to that curriculum is more concerned with ‘an ideal plan’, while educational environments represents momentous reality of that plan. To answer the research question - how should the values whose education is aimed at defining the objectives of the curriculum should manifest themselves in educational environments? - the conceptual framework is introduced.

Background. Attention to the emotional and spiritual dimensions of both teaching and learning in curriculum helps to seek several qualities. First, to enable knowledge to be gained through the cognitive dimension in a meaningful way taking it to a deeper level (Booth, 2009, 2014). Second, it leads to the development of emotional intelligence and spiritual intelligence along with cognitive intelligence (Yurdakul, 2008, King, 2008). Third, it reveals the spread of value-laden messages in the curriculum through value-based ‘hidden curriculum’. While the ‘hidden curriculum’ is in process at all times (Kereti, 2009), it serves to communicate tacit messages to students about values, attitudes and principles. Due to the ‘hidden curriculum’ values impact and reinforce attitudes (Lee, 1995). This highlights that teacher must be very careful, responsible, and sensitive when trying to find the balance between his/her own, learner’s, and curriculum’s values of set (Hildebrandt, 2007, Tablet, 2014). Fourth, both the spread of value-laden messages and the ‘hidden curriculum’, which can reveal through the unexpected, unintentional interactions between teachers and learners (Kereti, 2009), encompass the careful creation of educational environment (Kereti, 2008, 2013).

The concept of an educational environment (Kereti, 2008, 2013) emerged as a counterbalance to learning environments that are based on information-technological point of view. The concepts of the learning environment of this approach are limited to the partial coverage of learning peculiarities; thus, the educational possibilities of these environments are not explored. EE is related to teaching and learning, the learning environments - only with learning (Karenskaute, 2000). According to Kereti, the concept of EE is a dynamic informational learning environment, purposefully created and impacted by educator and learning purpose, accordingly with corresponding content and educational forms, methods, ways, objects or subjects, that influence the educational information or its communication to the learner. The given definition reveals the essence of the educational environment and both highlights the parameters of its development and defines the ways to achieve it.

Research methods is based on the literature analysis. The current research paper employs the method of scientific literature review. According to Grant, Booth (2009), such method seeks to identify what has been accomplished previously, allowing for consolidation, for building on previous work, for summation, for avoiding duplication and for eliminating omissions or gaps.

Dimensions for value-driven educational environment creation:
1. Value-laden educational goal;
2. Learning capacity of the learners;
3. Educational content relevant to the value-laden educational goal;
4. Ways and means of communicating educational content;
5. Methods and means of developing educational content in the process of learners’ performance;
6. Physical environment relevant to the value-laden educational goal and conditions of its implementation as well as different items in the environment;
7. Individuals involved in the implementation of the value-laden educational goal.

Conclusions. Values are the core of the rationale of curriculum. They spread out through the process of its implementation and form the foundation of values-based curriculum. The later through integration of spiritual as well as emotional and cognitive dimensions helps to convey value-laden messages encompassing the creation of value-driven educational environments. In such environments, values clearly manifest in both educational goal and content. In order to ensure the effective implementation of the value-driven educational environment and empowering learning on the individual and collective levels, all dimensions of educational environment creation must be accomplished.

References

Effect of Entrepreneurship Pedagogy on Health Education
Gloria McNamara, PhD & Christoph Winkler, PhD

Introduction
This research study uses an educational model known as health entrepreneurship. Entrepreneurship education refers to a pedagogical process that involves the stimulation of entrepreneurial behaviors and mindsets.

Rationale
Although entrepreneurship education is recognized as important, relatively few empirical studies have been conducted regarding its impact on community college students in general and non-business majors in particular.

Purpose
This study plans to stimulate learning among health education students by utilizing an industry-engaged learning model that will facilitate knowledge acquisition and foster entrepreneurial competencies.

Methodology
This study uses a quasi-experimental design with a convenience sample (N=60). The experimental health class is exposed to entrepreneurship pedagogy (EP) and the comparison health class is not. Participants are students of diverse ethnicity from urban community college. Data continues to be collected using written surveys to examine the pre- and post-intervention impact on the dependent variables of knowledge and entrepreneurial capacity, attitudes and behaviors.

Hypothesis
It is hypothesized that students in the entrepreneurship pedagogy (EP) class will demonstrate greater gains in the dependent variables.

Preliminary Findings
Pre-test data collection thus far reveals participants have a moderate level of confidence in their ability to adequately search, plan and conduct start-up activities. Further, the same participants have rated their capacity to start up a venture more favorably than their capacity to sustain one long term. Regarding attitude, participants possess a favorable view of entrepreneurship worth, satisfaction and value. However, this is not necessarily reflected in entrepreneurial behavior. Additionally, the lack of effort, time and money shows a gap between cognition and action, which the intervention may have potential to rectify.


Coloured hearing pseudo-synesthesia as a potential lever to teach and learn languages

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Teaching and learning foreign languages is a key issue for the creation of the future society and France has lagged far behind in this field of education. Teachers are still looking for appropriate learning materials.

English and French use the same alphabet and French learners of English tend to pronounce English as an extension of French. Their phonetic repertoire must be improved since it would be a key element in learning a foreign language, but also how to read and write. Phonological awareness is a key element for 1) decoding and writing of regular words on a phonological level, 2) identification and representation of words, and 3) phonological awareness, which is necessary to improve the phonological processing of the written language.

- In the Gattegno’s approach (1978), reviewed by Young (2011), each sound is associated with a particular color, thus providing a visual representation of the phoneme that gets more concrete (materialised).
- The Bourd Hisen’s approach (1996) relies on links between sounds of speech and gestures.

Preliminary studies (Magna, 2013; Le Page, 2015) used colors to represent phonemes in phonemic awareness tasks in English as a foreign language. There was no significant difference between groups who learned with and without the use of the sound. Results indicate that the phoneme-color code used can be quickly acquired.

This led to a first open source prototype called Kaphones (Kolonko, 2013) with rules to represent the phonemes of English and French are spatially organized individually. The phonological processing of the code is conditioned to the pronunciation of each sound. Each phoneme has a color and a recorded sound.

- Creating in memory a strong relation between a sound and a color is close to synaesthesia.


coloured hearing synesthesia

Coloured hearing synesthesia (coloured hearing synesthesia) is one of the most common types of synesthesia (mentioned in the scientific literature 200 years ago). These synesthesias cause individuals to hear sounds and see colors while hearing sounds.

For example, hearing the sound of a siren could evoke the visualization of a red color in the mind. Different synesthesias can be divided into two categories: verbal and visual synesthesias. Verbal synesthesias can be a part of any language, while visual synesthesias are exclusively related to specific color associations.

The present study hypothesizes that such an association between sound and color is more easily memorized or memorized by people who are highly involved in musical education. As for specific musical training, musical training may lead to an auditory perception that is enriched by a visual perception.

To be used as a real tool to teach phonemes, the phoneme-color code should be the same for all learners, like a convention that won’t change; hence, one of the key questions among this project will be to define the appropriate phoneme-color code.

Hypothesis 1: Coloured hearing can be trained

The hypothesis is that the coloured hearing synesthesia (coloured-hearing association) can be explicitly trained. Unless Cohn et al. (2012) who created lexica, and with the four more frequent letters coloured to study colour-glyphs pseudo-synesthesia, we could create a visual code to colour the letters of the alphabet. For instance, if the letter “A” was associated with the color red (synesthesia for a phoneme). In the literature, reading studies on children with dyslexia and reading comprehension have shown that the learning of new phonemes is easier when they are related to new visual stimuli. This is why we wanted to create a new association between phonemes and colors. Coloured hearing synesthesia among adults who already know how to read in their mother language. Young learners (learning how to read and write) on the other hand, would be more likely to associate the colors with the phonemes.

Hypothesis 2: Coloured hearing can help distinguish and pronounce new phonemes

The second hypothesis is that someone who can hear new phonemes can help distinguish and pronounce new phonemes. This would be possible if speakers could relate new phonemes to new visual stimuli. Some studies have shown that phonemes can be distinguished and pronounced better if they are associated with specific sounds.

Procedure

We will create books and audiobooks specifically for this study.

We will create a list of colors that will be used to identify each phoneme.

We will then ask the learners to listen to the audiobook and to color each phoneme according to the list.

We will also ask the learners to write the phonemes they heard in the books.

Further studies

Neuroscience: check whether the association between sounds and colors is stronger in both ways: 1) easier to remember new phonemes 2) easier to remember new colors

References

**Instructed Heritage Speakers of Spanish: What Happens after Secondary School**
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**Heritage Speaker**
Although broader definitions exist, for our purposes we are defining a heritage speaker as “a person who grew up learning a heritage (minority) language and has some proficiency in it” (Benmamoun et al., 2013)

**Background**
The heritage language (HL) phenomenon has attracted the attention of researchers in a variety of disciplines.

- As explained by Montrul (2016), HL grammars in a second language (L2) environment may include first language (L1) less by immigrants who are native speakers, or what has been termed “incomplete acquisition” by those speakers exposed to two languages simultaneously since birth, but not equally, or in a large variety of contexts.

- Despite wide interest in this phenomenon, to date the research with heritage speakers has been highly compartmentalized and does not take into account the considerable variation among these speakers, in terms of input, use, and other relevant life experiences.

**What is Missing?**
- A sociolinguistic, qualitative account of specific experiences and circumstances may have a potential impact on linguistic systems—without this we risk rendering an incomplete picture of the heritage speaker.
- This study tries to bridge this divide by looking at an understudied population: "naturalistic" heritage speakers who are also "instructed" and literate in Spanish.

**The Study**
**Purpose and Research Questions**
- The purpose of this study is to understand the phenomenon as the participants experience it, through the use of phenomenological interviews and focus groups (Giorgi, 2009). It is guided by the following overarching questions:

- What "is it like?" to be a heritage speaker of Spanish who graduated from Cesar Chavez High School (CCHS)? What are the personal, social, and societal factors which constitute the phenomenon?

**Setting/Context**
- This study took place at CCHS (a pseudonym), a small urban high school with a Latino-centric curriculum aimed at promoting biliteracy and bilingualism, founded by nine bilingual high school teachers, their students, a university professor, and a group of parents.
- All students received a redesigned “Latino-centric” and liberationist core curriculum delivered through both languages by bilingual teachers.
- Spanish for Native Speakers (SNS) was required all four years; in addition, Advanced Placement Spanish language (and literature) was offered.

**Participants and Method**
- 25 Bilingual CCHS graduates ages 19-26
- Six participants arrived in the US from Mexico between the ages of 5 and 10
- Nine subjects born in the US into Spanish speaking homes
- Three arrived in the US from Mexico between the ages of 11 and 15; Seven arrived before the age of 5
- Participants were interviewed using a phenomenological approach (Giorgi, 2009), which consists of open ended questions to elucidate 1) the life histories of young adult Spanish heritage language speakers, 2) details of the phenomenon under study as experienced by the participants, and 3) reflections on the meanings of such experiences by the participants.

**Phenomenological data analysis approach.**
- Interviews were recorded and then transcribed verbatim.
- Researchers listened several times for a "sense of the whole"
- Meaning units were then determined, marking transcriptions for perceived shifts.
- The researcher transformed the data into "constituents"—researchers bracket their past knowledge to experience the phenomenon at a deeper level, termed the epoché.

**Results**
Three constituents (themes) emerged from the analysis

- **Constituent One: Relationships and Social networks.**
  - All participants maintained a consistent use of Spanish with family, although difficult with younger siblings.
  - Participants also report that attending CCHS and improving their Spanish led them to a wider circle of peers, including recent immigrants from Mexico.

- **Constituent Two: Linguistic Marketplace (Bourdieu, 1991).**
  - Being bilingual and biliterate has become important social capital for the majority of participants.
  - CCHS graduates are employed as bilingual teachers and paraprofessionals at schools, bilingual employment counselors, medical interpreters, bilingual dental assistants, bilingual peer counselors at the university, and bilingual salespeople.

- **Constituent Three: Education.**
  - Participants had a wide variety of pre CCHS educational experiences.
  - Some attended monolingual Catholic "voucher" schools where the use of Spanish was actively discouraged.
  - Others came from bilingual or monolingual public schools.
  - Some had a few years of schooling in Mexico or Puerto Rico before coming to the US.

- "Age of arrival" and "age of acquisition" are important factors but not the only ones to influence Spanish use.

- Social and ethnic identification also play a role, although there is not a uniform influence.

- Maintenance of Spanish literacy and access to print remains a challenge for some.

**Concluding Thoughts**
- Acceptance and social interactions help to shape the linguistic path of the HL speaker (Hy, 2010).
- HL “proficiency” may be non-linear. That is, heritage systems are constantly undergoing transformations by users.
- The potential role of HL literacy on these transformations needs to be investigated.
- “The philosophers have only interpreted the world in different ways; the point is to change it.” Karl Marx