

Design Thinking and its Potential to Improve Willingness to Communicate in the Classroom

by

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ABSTRACT

Students who experience low willingness to communicate (WTC), especially orally, are less likely to feel engaged and valued in the classroom. This can lead to a problematic downward spiral of participation and achievement. The literature suggests that low WTC is influenced by feelings of anxiety, or communication apprehension, as well as low self-confidence in one's communication capabilities. Teaching practices such as the design thinking model can help to create an environment conducive to improved WTC. Design thinking encourages students to use empathy to generate solutions to complex problems. Its focus on open-mindedness creates an environment in which students experience less communication apprehension. At the same time, the design thinking model offers many opportunities for students to improve linguistic competence, thereby increasing their communicative self-confidence. Ultimately, teachers who integrate elements of the design thinking model into their practice have the potential to improve the teaching and learning environment for all.

Keywords: Language learning; communication competence; design thinking; willingness to communicate.

DEDICATION

For my colleagues and friends at L2RIC and Marshall D'Avray Hall: Thank you for welcoming me into this caring, supportive environment that has allowed me to reflect and grow.

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List of Abbreviations

CA Communication apprehension

FSL French second language

IB International Baccalaureate

L1 First language

L2 Second language

PBDT Problem-based design thinking

SPCC Self-perceived communication competence

WTC Willingness to communicate

Introduction

Today's schools are attempting to adapt to a pace of global societal change that is only expected to accelerate. This dynamic outlook towards the future has inspired several educational reforms that focus on cultivating skills and habits, ultimately empowering students to adapt more quickly in uncertain territory. Among them include the progressive education model, which emphasizes transdisciplinarity, critical analysis and the development of the whole child. In recent decades, many educational institutions and programs, including those in New Brunswick, have transitioned away from a traditional learning approach in favour of a more progressive and holistic model. One example of such programs is the International Baccalaureate (IB) program, which is centred upon a learner profile including 10 holistic attributes that all IB students should strive to develop. Similarly, the New Brunswick Global Competencies, a foundational document that supports the learning approach all public schools from K-12, describes a variety of well-rounded attributes that anchor learning and student achievement.

During my first year as a teacher in New Brunswick, I taught Grade 8 math and science in a public school piloting a project called the "Centre d'Apprentissage". This project sought to incorporate several aspects of the progressive learning movement, including increased innovation and collaboration, into the classroom. One of the major changes implemented by the school was the integration of all the Grade 8 students (62 in total) into a combined class. This environment changed the traditional classroom dynamic and learning experience for everyone involved. In the province of New Brunswick, the public school system is divided into an Anglophone and a Francophone sector. Although I was working in a Francophone school, this school served a region in which less than 5%

of residents speak French at home. Many of the students were thus reluctant to express themselves in class, gripped by a combination of pre-existing linguistic insecurity of speaking or writing in French, and the additional social anxiety of confronting such a large group. Furthermore, as I only had one or two instructional hours per day with the whole group at once, the classroom environment was less intimate and conducive to relationship-building. It was thus more difficult to incorporate my students' interests into my teaching. These conditions led to a problematic lack of engagement which was demonstrated in part by low willingness to communicate. Willingness to communicate (WTC) is defined as the readiness of an individual to enter into discourse at a given time (MacIntyre et al., 1998). I recognized that this gap was creating a downward spiral in which students were less willing to communicate, leading to them feeling less and less competent in the subject matter area, which only further decreased their likelihood to engage with their peers or me as the school year went on.

Throughout the school year, I tried several different approaches to increase WTC in an effort to improve the classroom dynamic as well as learning outcomes. I found that many passive learning strategies, such as having students read a text and respond to questions, were especially unsuccessful in engaging students or inciting discussion. As a science teacher with a background in consulting engineering, I was curious to test design thinking-based lesson plans to see if they would engage my students and encourage them to develop the self-confidence to contribute. Design thinking in education entails an iterative process in which students work collaboratively to propose and refine solutions to a complex, ill-defined problem (Henriksen, Richardson, & Mehta, 2017). I found that many of the components of successful design thinking-based teaching at the middle-

school level can be leveraged to improve students' WTC, especially in the context of learning an additional language. Furthermore, the design thinking framework lends itself well to the development of the Global Competencies elaborated in the 2023-2025 holistic New Brunswick curriculum, as well as the descriptors outlined by the IB learner profile. Developing teaching practices for multilingual learners is especially relevant to the province of New Brunswick, given its complex linguistic portrait and changing demographics.

French linguistic background and current landscape of New Brunswick

New Brunswick is Canada's only officially French-English bilingual province. Its dual track public school system serves 68,128 students in the Anglophone sector and 29,135 students in the Francophone sector as of 2020 (Government of New Brunswick, 2021). All students in both systems are required to study the other official language for at least a portion of their academic career. Furthermore, within the Anglophone system, over 36% of eligible students are enrolled in French immersion, in which a majority of academic subjects are taught in French (Canadian Parents for French, 2019).

These statistics might provide a snapshot linguistic portrait of the province, but they do not explain its complex history of cultural and linguistic persecution. The territory that is now New Brunswick was inhabited by Indigenous peoples for over 12,500 years. Over time, Nations such as the Wolastoqyik, Mi'kmaq, and Passamaquoddy formed with distinct languages and cultures (Foley, 2020). During the 16th to the 18th century, colonization by the French and English, and their ensuing brutal conflicts and cultural policies, served to disrupt and assimilate these Indigenous people into western culture. This involved the eradication of Indigenous languages.

Concurrently, the ongoing disputes between colonizing countries created a power dynamic between the French and English. French-speaking settlers, who by the mid 18th century had successfully developed a thriving way of life and unique Acadian culture in the Maritimes, were subsequently subjected to attacks from the English intended to eradicate them from the territory. The English forcefully deported the Acadians in the 18th century to other parts of North America and even France, fragmenting and devastating their settlements over the course of several years. A small portion of these families managed to make their way back to New Brunswick over the following centuries, re-establishing a sizeable Acadian population concentrated in the north and east of the province (Griffiths, 1993). These conflicts and resettlements contribute to New Brunswick's complex linguistic historical landscape.

The legacy of the socio-political persecution of the French in New Brunswick has important implications for WTC in French heritage language users and learners. The disruption and displacement of French settlers to the province has resulted in the development of several distinct Acadian French language varieties. Acadian French differs from region to region, but commonly features many older French words and accents. One of the most distinct varieties, chiac, has developed in the south-east of the province where there is considerable contact and language borrowing from English. Chiac employs vocabulary and grammatical structures from both English and French (Gérin, 1983). As a result, chiac speakers often find that their language variety is quite different from that of Francophone communities in the French-majority province of Québec, the French found in popular media, and even the standard French taught in schools (Allard & Landry, 1998). Thus, many heritage French speakers in the province

report linguistic insecurity; overly negative perceptions of their own French language abilities. In fact, as many heritage French speakers increase their mastery of English over time to access job opportunities or interact in the community, they may even perceive themselves to be more capable of communicating clearly in English, leading to them using English even with other Francophones. This phenomenon effectively contributes to assimilation into the English language and further loss of community Francophone vitality (Allard & Landry, 1998). Linguistic insecurity is experienced by a larger proportion of students in Francophone minority regions (Boudreau & Dubois, 1992). This is especially concerning as there has been a general trend of anglicization across Francophone regions in the province for several decades.

Linguistic insecurity can also change the preferred language spoken at home. For example, parents of French heritage may suffer linguistic insecurity to such a degree that they are not comfortable speaking French at home. While these parents may hope that a French education will provide their children with the skills to support French as a primary language, children learning in a French academic context might find that their education does not provide them with the right skills to successfully engage in conversation in the home setting. From my observations in the classroom, an aging population and exogamy has meant that many young people today have fewer strong personal connections to individuals in their lives that speak French exclusively. For heritage language learners, developing the ability to converse with their loved ones is a main source of motivation to develop their language skills (Noels, 2013). Declining motivation in this regard can contribute to low overall WTC in French, especially for those in English-majority communities.

In the French second language (FSL) setting, WTC remains an important consideration for students and educators alike. Research into effective immersion practices suggests that integration of relevant content to language learning, as opposed to language being taught in isolation, is one of the cornerstones of effective teaching and learning (Genesee, 1994). For immersion students with beginner second language competency, their own perception of their linguistic competency has been shown to be the most reliable predictor of WTC (MacIntyre et al., 2003). Thus, early immersion teaching should focus on developing the building blocks of communication that students want and need to use, in order to help them feel more confident and capable in their L2 context. As immersion students advance in their program and presumably improve their communication competence, their level of apprehension about using the language has been shown to be more important in determining WTC (MacIntyre et al., 2003). Creating a welcoming, supportive environment where students feel free of judgement is thus another essential component of improving WTC.

Finally, it is important to consider that across both the Anglophone and Francophone systems, regardless of the program of study, classroom demographics are changing. The rate of newcomers to the province has increased dramatically in recent years, fuelled largely by permanent immigrants with neither French nor English as a mother tongue (Hamm et al., 2021). In all, at any given time, a sizeable portion of students in New Brunswick are expected to use a different language in the classroom than the one they use at home. Developing strategies to improve L2 WTC should thus be a priority for educators across the province.

It is clear that for many public school students in New Brunswick, choice of language presents challenges to communication. The interwoven history of persecution and related linguistic insecurity of heritage French speakers in the province has left indelible marks on both the French immersion program and the Francophone system. Today, in both settings, many students consider French their second or additional language. In the context of New Brunswick, broadly speaking, the influence of Anglophone media and the rise of English as a global language are factors that present further challenges to teaching and learning in French. Thus, it is reasonable to assume that there are classrooms across the province struggling with low WTC in the target language. This phenomenon has undesirable consequences, as less frequent communication has been associated with lower student engagement and lower rates of language acquisition.

This project reviewed current research on WTC in the second and additional language context. It described the elements of the design thinking framework, including several contemporary studies on the design thinking in education and its influence on interpersonal communication. My project culminated in a conference session at an IB education symposium hosted by the University of New Brunswick on March 26-27, 2024. At this session, I presented my findings and personal experiences as an educator who successfully incorporated elements of the design thinking model into my teaching. To support other educators, I described practical solutions to problems that I encountered throughout the process and provided them with a package of design thinking project ideas ready to implement in the classroom.

Willingness to communicate

Why are some students eager to speak up in class, while others would rather shrink into the background? What can educators do to ensure that all students feel that they are able to communicate freely? The concept of WTC has emerged in recent decades as an important factor in first language (L1) and L2 communication. Willingness to communicate has major implications for teaching and learning, including ramifications for student engagement and successful second language acquisition.

The concept of WTC was originally developed in the L1 context. McCroskey and Baer (1985) first described this construct after inverting work by Burgoon (1976) on unwillingness to communicate and communication avoidance. McCroskey (1992) defined WTC as the likelihood of an individual to speak out when given the opportunity. McCroskey and Baer (1985) acknowledged that factors such as time stressors, intent, or level of familiarity with the interlocutor may influence the willingness of an individual to engage in communication at a given moment. However, despite the role of these factors, they proposed that WTC is a “personality variable” (McCroskey & Baer, 1985, p. 1) that remains relatively constant across communication situations from one individual to the next. McCroskey and Baer’s WTC scale (1985), which includes references to 20 different communication contexts, was developed to measure and validate this assumption. Results from a survey of 428 college students suggested that an individual’s WTC in one context or with one receiver type was indeed highly related to their WTC in other contexts and other receivers. Essentially, an individual who was often willing to communicate during meetings could also be expected to demonstrate the same behaviour with acquaintances or friends (McCroskey & Baer, 1985).

If it is indeed true that WTC is an innate characteristic of individuals, with only a moderate level of situational variability, McCroskey and Richmond (1987) were interested in exploring the multiple hypothesized antecedents to WTC. Variables such as introversion and alienation had previously been associated with an individual's inherent predisposition towards communication (Burgoon, 1973). Subsequent research indicated that among the variables studied, (self) perceived communication competence and communication apprehension were the most strongly correlated with WTC (McCroskey & Richmond, 1987).

Self-Perceived Communication Competence

Self-perceived communication competence (SPCC) refers to an individual's perception of their own ability to pass along information (McCroskey & McCroskey, 1988). In general, SPCC is formed over time by an individual's experiences and interactions. For example, a student who enjoys public speaking and is consistently told by teachers, friends, and family that they are a "natural storyteller" may report a high level of SPCC in these communication situations. Interestingly, SPCC appears to be independent of actual communicative ability (McCroskey & McCroskey, 1988).

Communication Apprehension

McCroskey (1976) defined communication apprehension (CA) as an individual's level of fear or anxiety with regards to real or anticipated communication with others. This response is thought to have a negative effect on performance and can vary from mild forms in which an individual experiences feelings of discomfort associated with communication, to severe forms in which an individual may be completely unable to

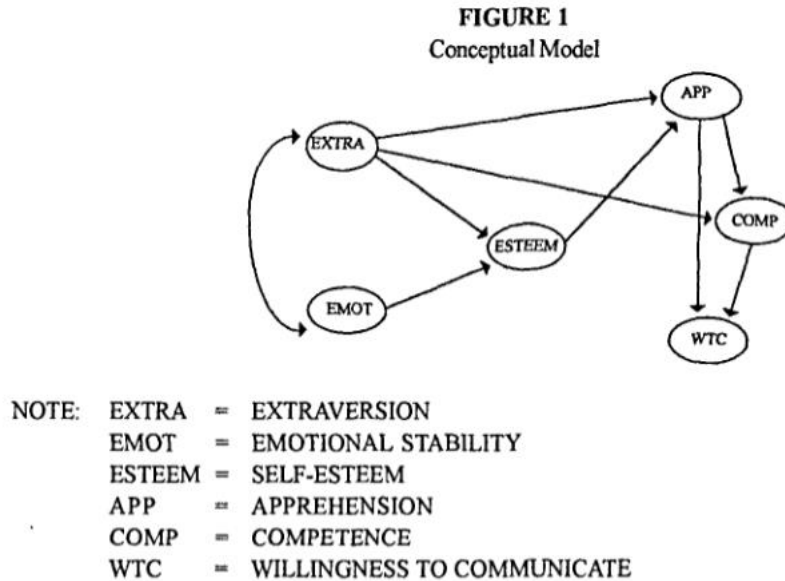
communicate. McCroskey (1997) made a distinction between trait CA, a widespread anxiety experienced across a variety of contexts, and state CA, which is situation-specific. Trait CA can be debilitating to normal processes of life such as relationship building and educational or professional experiences (Beatty et al., 2011). Individuals with trait CA attempt to avoid any form of communication if possible and suffer major anxiety-like feelings when communication is forced (Dwyer & Fus, 2002). Conversely, state CA, that is, situation-specific CA, is a normal phenomenon experienced by virtually everyone at some point in their lives. For example, many people become nervous before giving an important speech, or before performing in front of an audience full of people (McCroskey, 1977). The fear of being judged by others, underperforming, or not being understood are just some of the concerns that may contribute to an individual's CA in a given situation.

Self-perceived communication competence and communication apprehension, while distinct attributes, have both been shown to be reliable indicators of an individual's WTC in both early and more contemporary studies (Chesebro et al., 1992; Croucher, 2013). Studies of WTC amongst schoolchildren once again suggested that an individual may report differing levels of SPCC or CA depending on situational variables. These may include communication context, recipients, knowledge of the subject matter, among others (Chesebro et al., 1992). For example, a student who has previously been harshly criticized by a teacher for mumbling may report lower levels of SPCC when giving a class presentation, as their past experiences suggest to them that the teacher will not understand them, at the same time as they experience higher CA due to a fear of judgement.

McCroskey's (eg., 1992, 1990) work was foundational in defining the concept of WTC and identifying its most highly correlated personality factors. Meanwhile, MacIntyre (eg., 1997, 1998) sought to build upon this research and identify the psychological processes that determine an individual's WTC at both the trait and state level. His research resulted in a conceptual model of trait CA that illustrates the interplay between extraversion and emotional stability, and the subsequent influences of these personality traits on self-esteem, CA, and competence. His model (Figure 1) supported the idea that WTC was influenced majoritarily by CA and SPCC (MacIntyre et al., 1999).

Figure 1

MacIntyre's Model of the Causal Relationships Between Antecedents to WTC



Note. MacIntyre, Babin, & Clément (1999, p. 218).

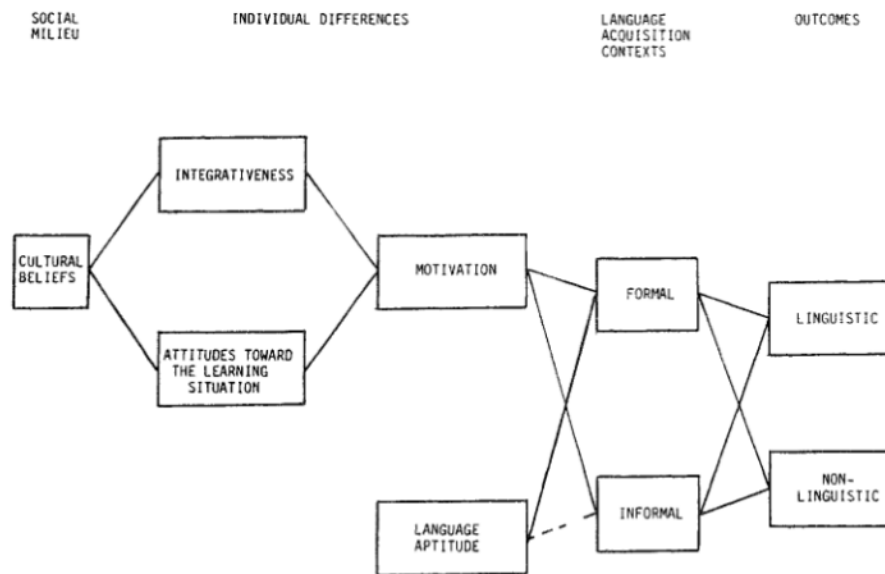
L2 Communication Motivation in the Classroom

Up until the mid 1990s, the socio-educational model of L2 acquisition developed by Gardner (1983) was one of the most widely accepted. Gardner's model proposed that an L2 learner's motivation is the product of their integrativeness, or desire to interact with members of a target language community, and their attitude towards the learning situation, including their opinion of their language teacher and course. This tripartite cluster was named the integrative motive of L2 learning, which in turn, influences the aptitude and motivation level of the student to participate in the classroom and in informal situations (Figure 2). The model also shows that experiences in both contexts

shape the learner's linguistic outcomes, meaning their language skills and knowledge, as well as their non-linguistic outcomes, such as interest in the culture.

Figure 2

Gardner's Socio-educational Model of Second Language Acquisition

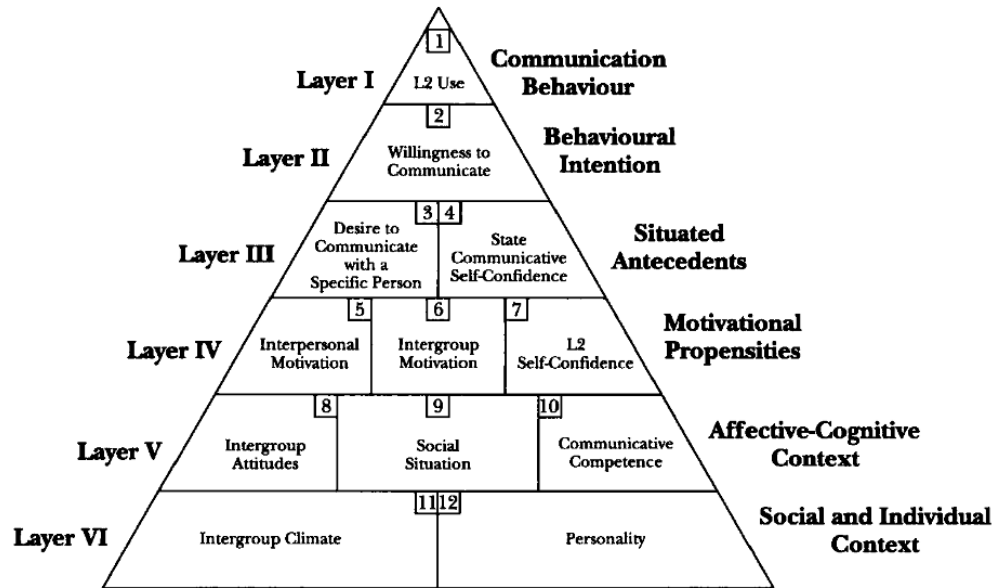


Note. Gardner (1983, p. 222).

MacIntyre (1998) continued his work on WTC by exploring its relationship with L2 acquisition. He explained that “[i]t is highly unlikely that WTC in the second language (L2) is a simple manifestation of WTC in the L1” (MacIntyre et al., 1998, p. 546). Instead, a multitude of social, psychological, and linguistic variables interact together to determine an individual's WTC in their L2. He proposed a heuristic model including six layers of factors that underlay an individual's decision to communicate in an L2 at a given moment of time (Figure 3). Broadly, the pyramid-shaped model is divided into two parts: situation-specific influences (layers I, II, & III), and enduring influences (layers IV, V, & VI).

Figure 3

Heuristic Model of Variables Influencing WTC in an L2



Note. MacIntyre, Clément, Dörnyei, & Noels (1998, p. 547).

Of the situational variables that affect SPCC and CA, the language of discourse is perhaps one of the most important (MacIntyre, 2020). This is because communicating in a different language often insinuates other major changes, such as particular social setting and the level of the individual’s language competence, which can contribute to a heightened fear response (MacIntyre et al., 1998). Again, MacIntyre (1998) acknowledged the importance of L2 confidence, “which is primarily defined by judgements of proficiency and feelings of apprehension” (p. 551), in determining L2 WTC.

L2 Self-Perceived Communication Competence

MacIntyre (1998) found that students and even teachers working in an L2 often report an extreme unwillingness to communicate that is starkly different from their position in their L1. Second language users may genuinely lack the ability to communicate in certain scenarios and may feel especially incompetent if they know they would be able to effectively communicate in their L1. Furthermore, given that SPCC is formed over time by a user's experiences, depending on the context, L2 users may have a much more limited pool of related positive experiences upon which they construct their SPCC. For this reason, individuals with sufficient communication skills to convey their ideas may still present as very unwilling to communicate, and vice versa. Notably, in other studies, high levels of L2 SPCC were found to moderate the influence of negative emotions on WTC, such as (Nadeem et al., 2023). This means that higher SPCC may encourage users to speak more often, despite experiences which may lead to negative feelings such as fear, anxiety and hopelessness. In contrast, it is known that certain communication behaviours that are often negatively received by others, such as stuttering, have been found to lower an individual's overall SPCC (Werle et al., 2021).

Specific to the L2 context, accent strength is another factor that may result in low SPCC despite a solid understanding of the language. In particular, research on accent attitudes suggests that native speakers may perceive non-native speakers with an accent to be less proficient and less intelligible (Cargile et al., 1994). Furthermore, speaking English with a perceived non-native accent has generally been shown to lead to negative judgements on social status, educational background and overall intelligence (Jenkins, 2007). A study of at-risk middle and junior high school students across the USA suggests

that “non-standard” language variations and dialects are also related to low SPCC (Cheseboro et al., 1992). The definition of “non-native accents” is contentious and socially constructed (for a discussion of this, see Ryan, 1983; Shuck, 2009). However, as Chesebro et al. (1992) explained, “[i]n almost every community, whether there is a substantial ethnic minority or not, there are numerous students who speak with an accent and/or dialect that is not “mainstream” (p. 355). Thus, the relationship between L2 SPCC and WTC is relevant to virtually all educational contexts.

L2 Communication Apprehension

Language anxiety is a relatively common experience for L2 users and learners, so much so that the term language anxiety has been used to describe the specific phenomenon of CA in an L2 (MacIntyre, 2007). Many people claim that they are not “good with languages” and report feelings of apprehension or resistance unique to the language learning experience, despite being highly motivated and quick learners in other situations (Horwitz et al., 1986.). In comparison to learning other academic subjects, language learning is unique in that it has a particular impact on an individual’s self-image; an immature grasp of the L2 can lead to feelings of inauthenticity, frustration and vulnerability when communicating with others. Horowitz et al. (1986) suggested that “[p]robably no other field of study implicates self-concept and self-expression to the degree that language study does” (p. 128). Furthermore, language learning often implies an immersion in a foreign cultural experience that includes different social norms. This environment can be destabilizing for an individual and increase feelings of uncertainty, and thus, anxiety. The effects of language anxiety can be discouraging to language learners. At moderate levels, students may shy away from contributing in class, sit in the

back or respond in a whisper to avoid being judged. In severe forms, students may completely abandon the language learning experience and abstain from any future interactions with the language (Imura, 2004). In a study of L2 WTC, MacIntyre, Noels, and Clément (1997) found that individuals with higher levels of communication apprehension tend to report lower levels of communication competence, despite no objective differences in their communication abilities.

To date, research on communication shows that SPCC and CA are also strong determinants of L2 WTC, although many people report lower WTC when using an additional language. Baker and MacIntyre (2003) suggested that students who report low SPCC and high CA often experience a downward spiral of WTC and language learning. These students, who are anxious and feel like they are not capable, are more likely to avoid opportunities to engage in communication. In doing so, these students “deprive themselves of the opportunity to improve their proficiency and experience” (Baker & MacIntyre, 2003, p. 71). Similarly, a meta-analytic review by Allen and Bourhis (2009) suggested a consistent negative relationship between communication apprehension and communication quality and quantity. Without engagement with positive communication experiences, student anxiety typically remains high while their SPCC remains low.

Numerous studies in the domain of L1 and L2 communication support the premise that high SPCC and low CA are the strongest predictors of high WTC (Burroughs et al., 2009; MacIntyre et al., 1999; Qinghe, 2024). Public schools have the potential to influence the development of these traits. Much of a person’s self-confidence in communication, along with their attitude towards learning, is cultivated over time in the classroom setting (Wigfield et al., 1991). Thus, it is the responsibility of educators,

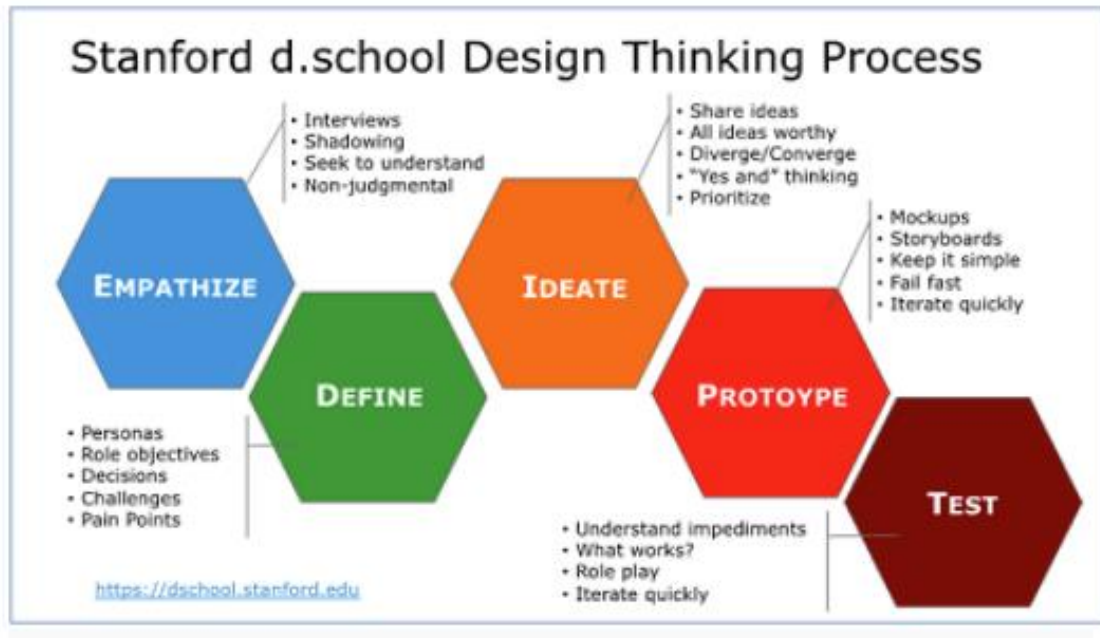
administrators, and policy makers to support the development of educational programming that is both conducive to confidence building in communication, while offering an accepting and encouraging environment. Design thinking, with its collaborative and process-based approach, is an example of one such type of programming.

Design Thinking

Design thinking is a relatively modern concept in the domain of education. The term represents a creative idea-generating process that incorporates elements of engineering, arts, and the social sciences (Buchanan, 1992). Many credit the Hasso Plattner Institute of Design, or Stanford d.school, for defining and popularizing the process. Their model (Figure 4) includes five stages; empathizing, defining, ideating, prototyping, and testing (Hasso Plattner Institute of Design).

Figure 4

The Five Elements of the Design Thinking Process as Defined by the Stanford d.school



Note: Hasso Plattner Institute of Design (2024).

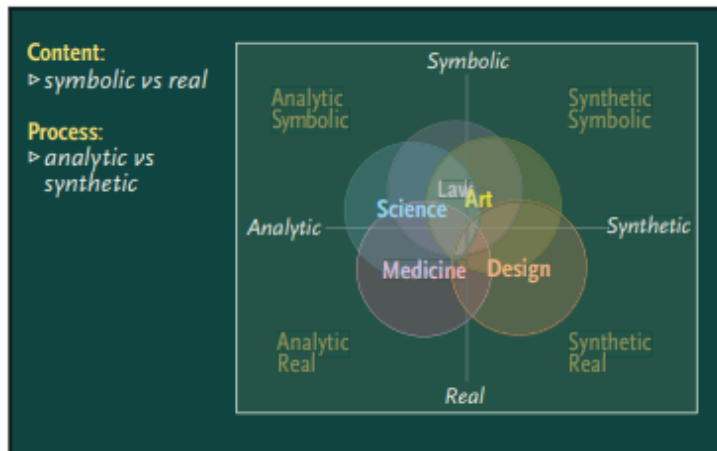
Over the years, the term has evolved to describe a problem-solving process applied by various students and professionals in many different contexts, from improving services, to urban planning, to resolving societal issues and beyond. More precisely, design thinking has been defined as an iterative creative process used to propose and test solutions to “wicked” problems, which can be described as ill-defined challenges with no set answer (Rittel & Webber, 1973). This model facilitates responding to real human and ecological needs, whether this be through technology use, product development, systems, or structures (Goldman & Zielezinski, 2022). The following exemplar scenario explores what each stage in the design thinking process could look like.

For example, hallway congestion in a public school that is over-capacity might be considered a wicked problem. There is no obvious and immediate solution to the problem, given that building an addition or reducing student numbers is not usually feasible in the short-term. Furthermore, the problem does not have one “best” solution, since there are a virtually unlimited number of approaches that could have a positive impact. Using the design thinking approach, improving the situation first involves developing an in-depth understanding of the problem and empathy for those involved. Upon speaking with teachers and students, a design team might find that the hallway congestion is particularly problematic on certain days when teachers are trying to administer tests, or that the congestion has led to other related issues, such as students being late to class because of the traffic. Once the designers have empathized with the stakeholders, they must define one aspect of the problem deemed to be the most significant. Perhaps the designers decide to define the issue primarily as a threat to a conducive learning environment because of noise pollution. From this definition, the designers will ideate, generating various solutions to the problem: sound-absorbing panels in the classrooms or halls, staggered class times, or re-organizing the layout of the school to create designated quiet zones, to name a few. During the prototyping stage, designers will create mock-ups of various solutions, such as a fire-safe sound absorbing blanket that could be hung from the walls, or a revised school schedule. Testing involves putting the solutions into the environment and evaluating their success. Since the design thinking process is iterative, these phases can be revisited and repeated until a viable solution is found (Foster, 2019).

Many consider design thinking to fall within the realm of constructivist approaches to education. According to the constructionist theory of learning, knowledge is created through interaction with the subject matter that allows the learner to create and connect new experiences to their pre-existing knowledge (Harris & Alexander, 1998). Incorporating the design thinking process into the classroom allows for students to engage with authentic tasks and real challenges that exist in our world. Design sets itself apart from other disciplines, such as science, law, or art because it lies at the intersection of synthesizing and what is tangible (Owen, 2007).

Figure 5

The Positioning of Design Thinking in Relation to Other Academic Disciplines



Note. Owen (2007, p. 18).

Design thinking emerged in education in the early 2000s (Norman, 2001). Educators who first implemented this framework into their practice began to recognize its potential to increase relevance and motivation in learning. Its emphasis on groupwork and creation of solutions of personal importance places the learner at the centre of the

experience, instead of the instructor (Norman, 2001). Working through the design thinking model has even been shown to help students handle problems in their personal lives (Razzouk & Shute, 2012). This is because elements of each of the five stages encourage the development of important competencies and skills, many of which are related to communication, motivation, and engagement.

Empathy

Empathy is the first focus of the design thinking model, as the designer must learn to communicate and appreciate the user's point of view. Empathy is a complex construct with nuanced definitions in a variety of disciplines. Generally, the term refers to the cognitive ability to understand, appreciate, and respond appropriately to the emotions of another person (Cuff et al., 2014). Whether or not empathy is teachable is a contentious topic. For example, the field of social work has included empathic responsiveness as part of its practical education since the 1960s. This has included educating and training such skills as paraphrasing within the context of dyads and triads (Kaplowitz, 1967). However, many believe that empathy is more of an innate attribute that can only be enhanced with educational interventions. Stein (as cited in Davis, 1990), a German phenomenologist, postulates that empathy cannot be caused or forced to happen. Instead, she stated that empathy is experienced when an individual has developed and practiced the expected behaviours, such as good listening skills. Regardless of one's position on the subject, practicing empathy and developing skills that increase interpersonal awareness and understanding have been shown to increase empathic responses in youth. The level of development and change in adolescent empathy has been shown to predict individual variation in social competencies in adulthood (Allemand, et al., 2014). There has been

increasing interest in recent years regarding school-based interventions to improve empathy after researchers determined a link between student deficit in empathy and aggressive behaviours in the classroom (Silke et al., 2018). While low empathy in students has been shown to correlate with victimisation and bully behaviours, high levels of empathy have been positively associated with prosocial and helping behaviours in youth and adults (Marshall et al., 2019). Thus, incorporating practices and programming in schools that promote the development of empathy is of interest to many educators.

The design thinking model always begins with empathizing with the user. This stage, as described by the Stanford d-school, requires the designer to seek understanding in a non-judgemental way. Designers may conduct interviews, develop surveys, or perform field visits to gain a more thorough perspective into the viewer's world. Early studies on this aspect of design thinking suggest that it is effective in increasing student empathy. For example, Dawbin et al. (2021) conducted a study measuring the change in empathy of Year 10 boys in Australia (aged 15-17 years) who completed a design thinking project intended to assist female victims of domestic and family violence. At the beginning of the project, students read a case study about a young mother who had received threats of physical harm and recently escaped with her two children to a women's refuge. They then completed the *Comprehensive State Empathy Scale* test. To initiate Stage 1, Empathize, students listened to presentations from several speakers, including police officers from the Domestic Violence squad and women's refuge caseworkers. The student groups were then given strategies for conducting empathy interviews to ask questions to the various presenters and used empathy maps to consolidate their findings. Over the course of the next five days, the students worked in

small groups to better understand and then develop ideas that would improve the lives of these victims. This involved iterating through Stages 2 – 5: Define, Ideate, Prototype and Testing. After completing their projects, the students read another case study about a different domestic abuse victim and completed the *Comprehensive State Empathy Scale* for a second time. Then, the student groups presented their ideas, ranging from a florist training program for therapy and financial independence, a community housing project, a camp for teenagers staying at the local women’s refuge, and apps to support youth experiencing family violence.

The results of this study suggest that the design thinking program was a successful intervention in improving the empathic state of the students. Significant increases from the pre-test scores were reported in five of the six subscales measured by the survey: empathic concern, distress, shared affect, empathic imagination and cognitive empathy. Teachers and parents also remarked how invested the students were throughout the process, with one explaining that “it was inspiring... to see how engaged the boys were and how seriously and respectfully they undertook this task. I think this will have a lifelong impact on them” (Dawbin et al., 2021, p. 450).

Furthermore, a qualitative classroom ethnographic study at a middle school in the USA examined the relationship between students’ expression of empathy during problem-based design thinking (PBDT) tasks (McCurdy, Nickels, & Bush, 2020). Students participated in four weeks of a weekly “STEM Third Space Genius Hour” in which they selected and developed their own original PBDT task to solve. In-class discussions, interviews, and artefacts were analyzed for themes or patterns after the four-week period. The authors identified a common theme of care and concern for

relationships, communities and environments that mattered to the students because of personal experience, career interest, or societal concerns. For example, one student who had previously been bullied chose to develop solutions to help others in a similar situation to seek help. Others chose to work on solutions for individuals in situations less familiar to them, such as children on the autism spectrum or malnutrition in developing countries. These students took on a spokesperson role, actively researching workable knowledge to better represent their target user. The authors concluded that “[e]mpathy was revealed as being the motor to engage students in the problem-solving task which provided the fuel to engage them in the more critical thinking and technical practices of STEM (McCurdy et al., 2020, p. 37)”.

Empathetic adolescents are better able to form and maintain relationships throughout their lives (Stern & Cassidy, 2018). Design thinking programming in schools has been shown to improve student empathy for causes that are both familiar and unfamiliar to them. In addition, empathy for the user has been shown to be a driving force that motivates the students to pursue their learning and engage in the task. Explicitly teaching communication skills, such as interviewing, storytelling, and active listening can contribute to a learning environment in which students feel more comfortable to express themselves. Furthermore, practicing these communication scenarios may help students to feel more competent in a larger variety of communication scenarios.

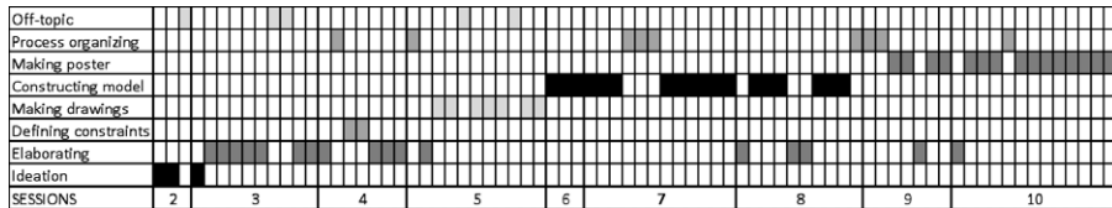
Learning to Learn

As the student moves through the define, ideate, and prototyping stages, they encounter opportunities to master different types of communication tools that allow for thoughtful planning and collaboration. Design thinking is commonly used to develop new products or other physical object or entities. In the context of the classroom, research has shown that students engaged in this type of design often prematurely jump to end-stage modelling, such as building 3-D models, when they are not taught the purpose and value of planning stages and design tools (Hope, 2005; Welch, 1998). The design thinking model differs in that it prioritizes the learning process over the end product. By dedicating time to phases that do not require a product, students learn to take the time to brainstorm, plan, sketch, and collaborate with team members.

A study of design thinking at the elementary level in Finland explored the implications of the design challenge on collaboration and communication among students (Kaiju, 2013). The researcher followed 32 students aged 10-11 years old as they participated in a lamp designing project spanning 11 sessions. The students worked in groups of two to four and were guided by an interior designer. An analysis of one particular group shows the breakdown of the productive components of each session (Figure 6). Ideating, elaborating, and sketching all represented a considerable portion of the overall process.

Figure 6

Time Dedicated by Student Group Members to Different Tasks Over the Course of 11 Design Thinking Sessions



Note. Kaiju (2013, p. 33).

The results of the Kaiju (2013) study suggest that the design thinking process, when correctly instructed, places large emphasis on the preparatory stages in which students develop many soft skills. Furthermore, while design thinking is typically presented as a 5-step model, students are often observed revisiting previous steps to clarify and re-work ideas among group members. Further analysis of the students' use of drawings, tools and dimensions of body and space throughout the sessions suggest that these aids allowed for consideration of technical features, which is not typical of elementary-aged students. In Kaiju's study, the interior designer showed how a measuring tape could be hung from the ceiling to visualize the lamp's size. The students then worked together to hang a model of the lampshade from the ceiling as one observed from afar, adjusting their sketches several times until they were satisfied. The author suggested that "[c]ompetence in designing cannot be reached through interaction that is merely verbal", but instead also depends on the use of materials, embodied communication, and interaction with group members, space, and physical models (Kaiju, 2013, p. 40). This research suggests that oral WTC is but one piece of the communication

puzzle, and that explicit instruction in tool use and modelling is effective at engaging students and encouraging communication through these other means. Furthermore, the design thinking sessions provided an opportunity for the groups to practice sharing, attentive listening and negotiating skills, all of which were deemed essential for a successful design thinking process.

Collaboration

In a separate study, Yilmaz (2021) explored the effects of a design-thinking project on the student learning experience within the context of a human communication and technology undergraduate course. Analysis of the students' self-reflection essays revealed that the design thinking framework "seemed to help students overcome the unique challenges associated with teamwork such as conflict, social loafing, coordination problems, and so on" (Yilmaz, 2021, p. 227). Once again, the students benefitted from collaborative communication tools that were explicitly modeled as part of the process, including individual brainstorming lists that were then pooled and evaluated as a group. As one student wrote,

During our ideation assignment, each group member had to write down a list of brain-stormed ideas and post each and every one of them to narrow it down. This forced us to contribute individually and then discuss ideas as a group. From our created lists, we were able to build on each other's ideas and narrow it down. Collaborating helped us a lot with being creative in our assignment. (Yilmaz, 2021, p. 227)

In contrast to other group projects, which may not include any attention to group dynamics or communication, design thinking encourages the use of tools that allow for improved collaboration and fairness.

Ideation and Open-Mindedness

Furthermore, the design thinking process cultivates open-mindedness in students. A key attribute in the IB learner profile, open-mindedness is a characteristic that encourages interpersonal communication in the classroom (Cui, 2022; International Baccalaureate, 2013). Open-mindedness has been defined as being “willing and within limits able to transcend a default cognitive standpoint in order to take up seriously the merits of a distinct cognitive standpoint” (Baer, 2011, p. 152). During the ideate stage of the design thinking model, designers are encouraged to generate as many ideas as possible and to welcome contributions from all team members (Bene & McNeilly, 2020). In contrast to convergent thinking, where group members attempt to narrow down solutions, design thinking encourages a divergent thinking model that is spontaneous and free-form (Yilmaz, 2021). While both types of thinking are needed in problem-solving, good designers consciously welcome others’ ideas (Paulus et al., 2018). Design thinking assumes that “the greater the number of ideas generated, the greater the chance of finding a good one” (Dell’Era et al., 2020, p. 330). In this way, the design thinking model offers students an opportunity to consciously practice open-mindedness. Open-minded dynamics are important to communication within groups as they have been shown to facilitate open exchange and discussion of diverse ideas and perspectives (Mitchell, Parker & Giles, 2012).

Iteration

Finally, the iterative nature of the design thinking model is also conducive to improving classroom WTC. Providing students with multiple opportunities to test and fail within the same project can foster a sense of familiarity that lowers communication apprehensiveness, and builds up SPCC over time. For example, Farouck (2016) conducted a study of second year Japanese university students enrolled in a business English communication course, a project-based learning model was tested for its impact on their WTC in English, their L2. Students were tasked with presenting a Japanese product of their choice. They were explicitly instructed on several themes, including expressing personal opinions, describing locations, and differentiating between the terms “made of”, “made from”, and “made out of”. Students then presented their draft presentations multiple times, incorporating instructor and peer evaluations at multiple occasions before giving their final presentation. The students reported an increased sense of ease with oral production throughout the process. For example, one student explained that:

I think that I’ve obtained the confidence to speak in front of other people. At first, I didn’t have the confidence at all. But as I repeated my presentation in front of many people, I got accustomed to speak in that situation. And I think that it is very good for students to obtain the confidence. (Farouck, 2016, p. 13)

By giving students time to familiarize themselves with a project and effectively become the experts in their subject in comparison to their peers and the instructor, the design thinking model allows students to feel competent and capable. The “fail fast”

approach to iteration is another component that potentially increases WTC, as this attitude lowers communication apprehension.

Conclusion

By now, the merits of constructivist approaches to education are well-known. Authentic tasks and active learning situations improve motivation and student attitudes towards learning. The design thinking model, which has more recently been adopted in the domain of education, incorporates these characteristics while also providing a framework that encourages explicit development of collaborative and communication strategies. Practicing these strategies equips students with different options to communicating, making it more likely that they will find one they are comfortable with. Furthermore, by putting students at the center of idea-generating, testing, and calibrating, they take on an empowering expert role that can also encourage them to communicate more freely. The concept of WTC in the classroom is complex, especially in the second language context. In New Brunswick, changing demographics and ongoing interest in French Immersion programming mean that L2 WTC is more important than ever. Design thinking provides insight into several mechanisms and techniques that can be leveraged to improve communication and the overall learning experience for students in a wide variety of contexts, especially in the FSL classroom. In order to share my findings with other educators, I prepared a breakout presentation for an IB teaching and learning symposium as well as a booklet of design thinking-based project ideas designed for the middle years. I will present these products in Chapter 2.

Chapter 2: Breakout Session Presentation

On March 26 and 27, 2024, the University of New Brunswick hosted an event in collaboration with the International Baccalaureate entitled “IB Days Atlantic Canada – Empowering students through an IB education: Symposium on teaching and learning.” This bilingual event brought together educators, policymakers and researchers interested in learning more about the IB. I decided to present at this symposium because I wanted to help other educators improve the learning environment in their classrooms. The IB is based upon a comprehensive learner profile which values strong communication skills, so I knew that my findings would be pertinent to the attendees of this symposium. I chose to present in French with the intention of attracting educators working in French classrooms who would likely relate to some of the issues I encountered with L2 WTC. The objective of my session was to equip other educators with the knowledge and skills to introduce design thinking-based projects into their classroom. My presentation slides are included here.



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Comment employer la pensée design pour promouvoir la communication en salle de classe

Jadine Krist
27 mars, 2024

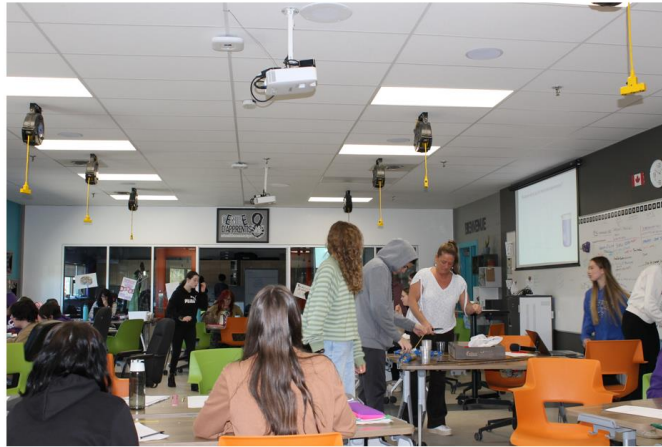
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Feuille de route

1. Mon contexte
2. Le dilemme de la communication
en salle de classe
3. La pensée design
4. Exemple d'un projet

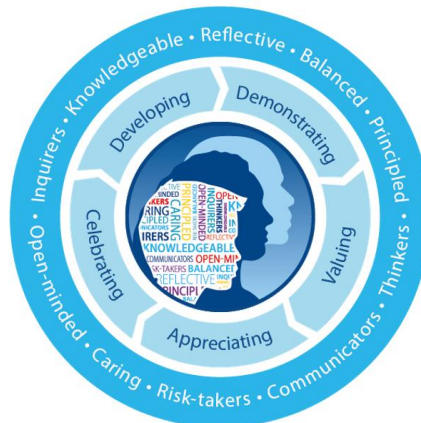


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Le profil de l'apprenant IB



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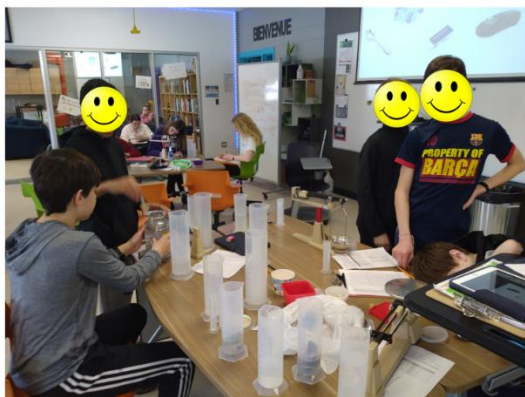


Comment engager mes
62 élèves en même
temps?

Comment répondre à
tous leurs divers
besoins?



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Le dilemme de communication en salle de classe...

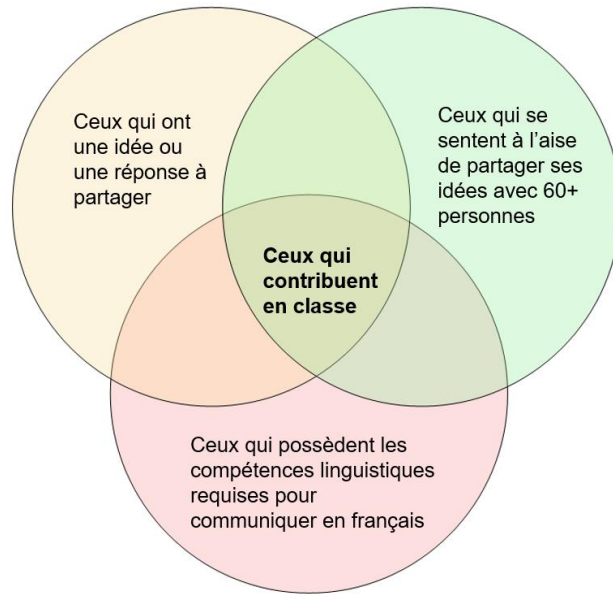
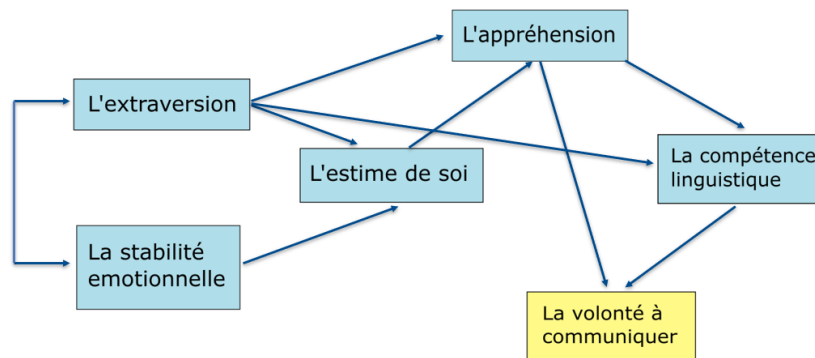
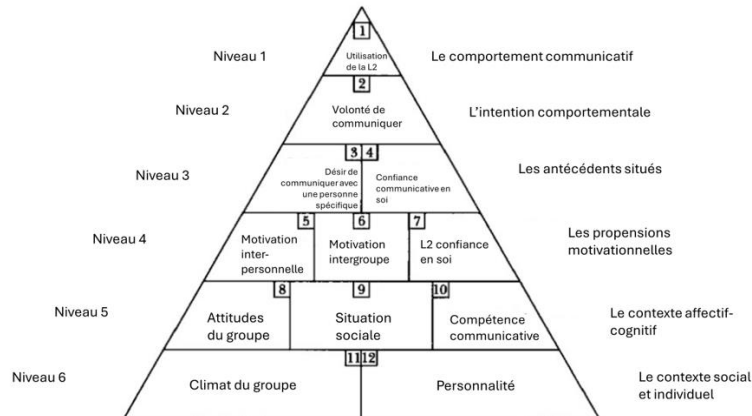


Figure 1. Le modèle socio-éducatif de l'acquisition d'une deuxième langue de Gardner.



Note: Gardner's socio-educational model of second language acquisition. Translated and adapted from "Learning another language: A true social psychological experiment", by R. C. Gardner, 1983, *Journal of Language and Social Psychology*, 4(2, 3 & 4), pp. 222. Adapted with permission.

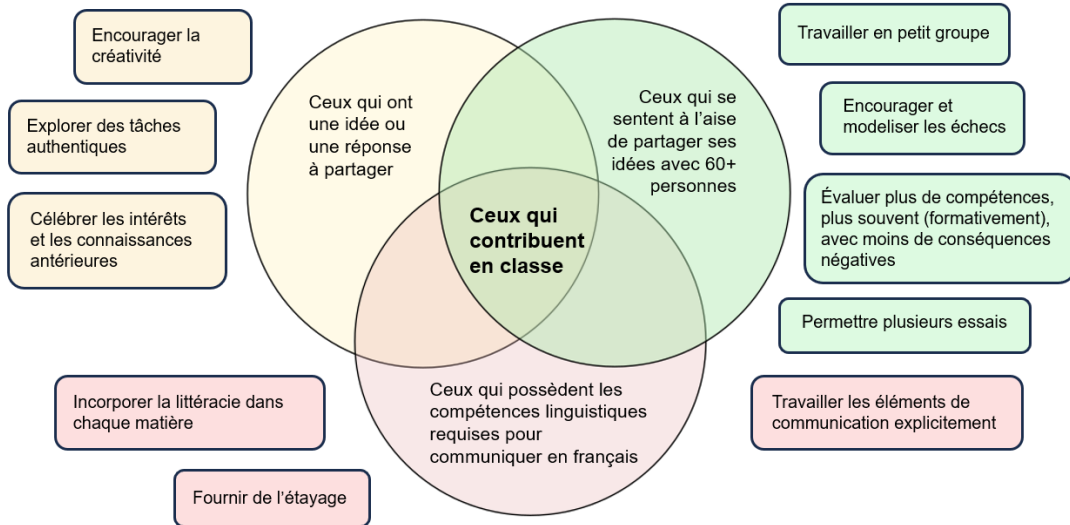
Figure 2. Modèle des variables qui affectent la volonté à communiquer dans une deuxième langue.



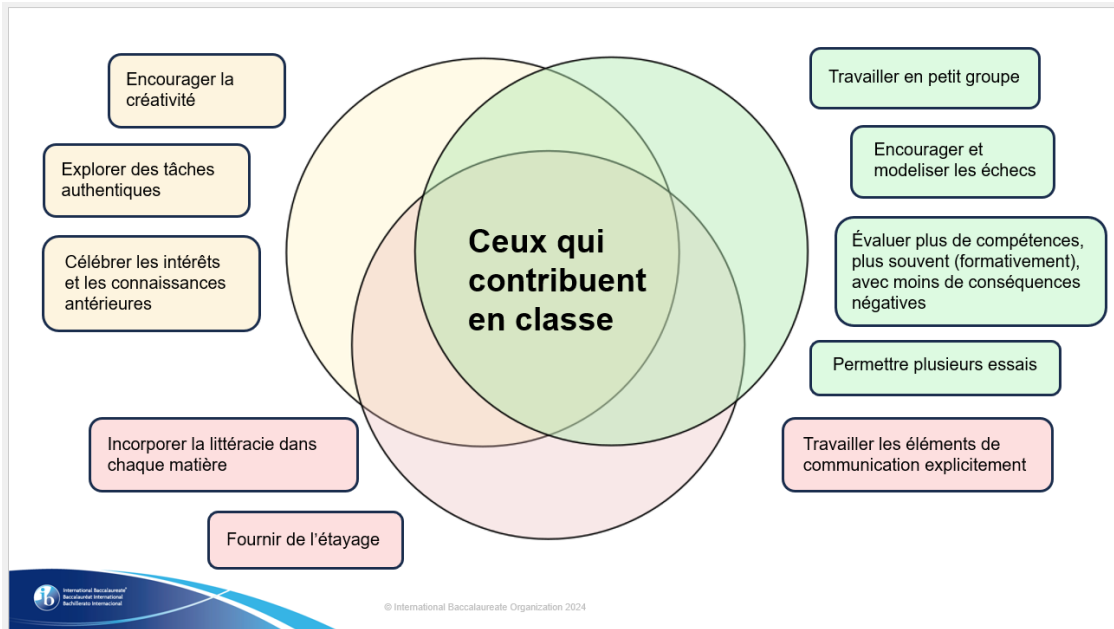
Note: Heuristic model of variables influencing WTC in an L2. Translated and adapted from "Conceptualizing willingness to communicate in a L2: A situational model of L2 confidence and affiliation," by P. D. MacIntyre, R. Clément, Z. Dörnyei, & K. A. Noels, 1998, *The Modern Language Journal*, 82(4), pp. 547



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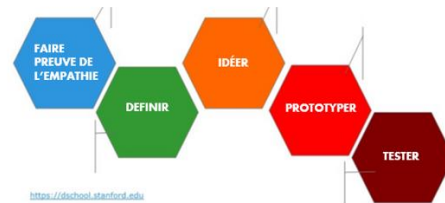


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1. Faire preuve de l'empathie

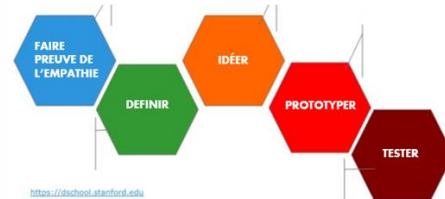
- Les concepteurs cherchent une compréhension profonde de l'expérience de quelqu'un d'autre
 - Entrevues, sondages, observations



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2. Définir

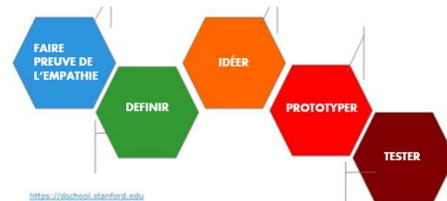
- L'aspect du problème que les concepteurs veulent cibler
- Les défis principaux
- Les considérations importantes



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3. Idéer

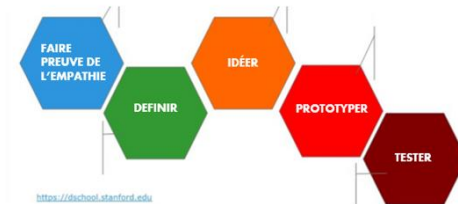
- Générer autant de solutions possibles que possible
- Être ouvert et encourager les idées et les contributions de chaque membre de l'équipe
- « Fail Fast »



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4. Prototyper

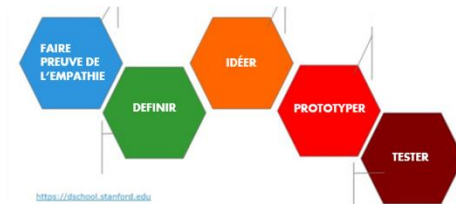
- Bâtir, créer, ou concevoir un modèle ou des modèles des idées proposées.



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5. Tester

- Déployer le prototype: le faire tester par un client potentiel, etc.



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Cibler la volonté de communiquer avec la pensée design

Baïsser l'appréhension de la communication

- Organisez les élèves en paires ou en petits groupes
- Valoriser and évaluer leurs habitudes de travail autant que le « contenu » du projet (l'ouverture à des perspectives différentes, la résilience, la curiosité)
- Incorporer/varier plusieurs modes de présentation (vidéo Youtube, podcast, article dans un magazine, carrousel)
- Offrir plusieurs occasions de présenter et modifier le projet avant la date limite (évaluation par les paires, etc.)

Augmenter la compétence communicative auto-perçue

- Encourager les élèves d'incorporer leurs propres intérêts et forces dans les solutions
- Fournir les élèves avec des exemples et des modèles pertinents
- Incorporer de l'enseignement explicite de l'écriture et de l'expression orale afin de soutenir les exigences du projet



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« Mme, qu'est-ce qu'on fait? »

« J'ai pas d'idées.... »

« J'ai déjà trouvé la meilleure solution, j'ai fini »

« Mes co-équipiers font rien! »

« Comment je suis censée évaluer tous ces divers projets? »

« Comment vais-je gérer le chaos? »

« Et si les élèves décident de ne pas travailler? »

« Je ne suis même pas une experte dans le domaine... »



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Le transfert progressif du projet « typique » à la pensée design

Projet
typique



Pensée
design

Le choix de sujet

Déterminé par l'enseignant (ex., la biodiversité, la santé mentale)

Déterminé par chaque groupe d'élèves

L'échelle

Déterminée par l'enseignant.e, très spécifique (ex. le parc par l'école, des jeunes de 10-12 ans)

Déterminé par chaque groupe d'élèves

L'horaire

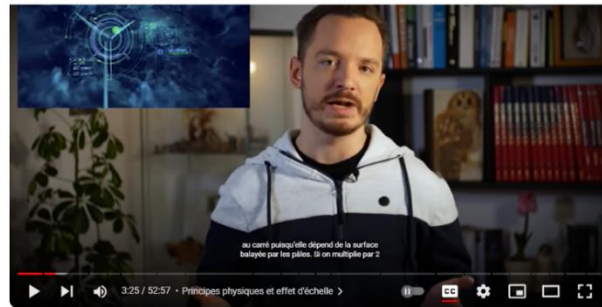
Dates limites fixes suivi par une évaluation pour chaque étape

Flexibilité totale avec une date de soumission à la toute fin, permettant l'itération d'étapes



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Projet: Éolienne flottante



Context

Climate change

United Nations

Climate change refers to long-term shifts in temperatures and weather patterns, mainly caused by human activities, especially the burning of fossil fuels.

Éolien en mer



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21 juin, 2040

Mise à jour importante concernant le développement d'une nouvelle centrale électrique

M. Holland, le ministre de ressources naturelles et développement de l'énergie, a présenté aujourd'hui la mise à jour du plan énergétique au Parlement à Fredericton.

« Nous sommes fiers d'annoncer que notre province poursuit le développement d'un parc éolien d'ici 2045 », dit-il lors d'une conférence de presse. « Il est important de reconnaître que l'énergie renouvelable nous permettra de sécuriser un avenir sain pour nous et nos enfants ».



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« Par contre, nous comprenons que notre population, qui est en plein croissance, exige une utilisation intelligente de nos espaces. C'est pour cette raison que nous planifions poursuivre la construction d'un parc éolien flottant – sur l'eau. De cette manière, on ne va pas perdre du terrain important aux structures. En même temps, on va pouvoir profiter des vents plus forts en mer. »

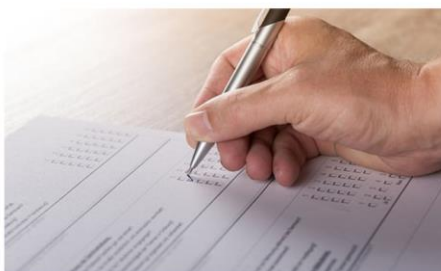


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Étape 1. Faire preuve de l'empathie.

Crée un sondage d'au moins 5 questions ouvertes pour mieux comprendre la réaction des habitants d'une ville à ce développement.

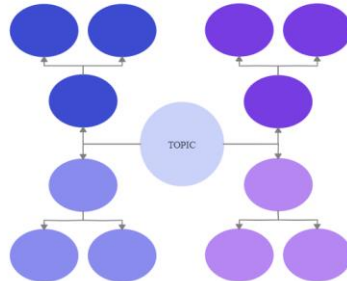
Tu vas sonder deux personnes en dehors de la salle de classe (parents, gardiens, frères, sœurs, amis, etc.) et partager tes réponses parmi les membres de ton groupe.



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Étape 2. Définir.

Rassemblez les réponses des sondages avec les membres de ton groupe dans une toile d'empathie. Identifiez des thèmes principaux que vous voyez.

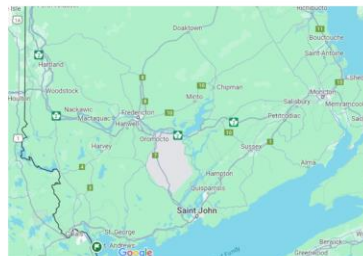


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Étape 3. Idéer

À l'aide de la toile d'empathie et des ressources suivantes, choisissez un endroit au N-B pour installer le parc éolien. Quelques considérations...

- Des vents forts
- Proximité d'un ville/village (pour des potentiels employés)
- Près d'autoroutes (livraison du matériel)
- Vos propres idées!



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Étape 4. Faire preuve de l'empathie.

Pas dans ma cour!

Afin d'éviter que les gens dans le village choisi se fâchent, il faut les aider à comprendre le projet.



Tourne une publicité qui explique pourquoi l'endroit que tu as choisi est idéal pour le parc. Explique comment fonctionne une éolienne avec une animation ou une affiche. Finalement, propose deux avantages de cette forme d'énergie et réponds à deux préoccupations possibles des citoyens.



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Étape 5. Prototyper et tester.



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	Écoute	Lecture	Production orale	Discussion orale	Écriture	
Faire preuve de l'empathie	Film	Film		Entrevues	Sondage	✓
Définir					Toile d'empathie	✓
Idéer			Publicité			✓
Prototyper/Tester					Protocole	✓
	✓	✓	✓	✓	✓	



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Merci beaucoup!

**N'oubliez pas d'ajouter votre nom
sur la liste pour les ressources
pédagogiques**

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References

- Buchanan, R. (1992). Wicked problems in design thinking. *Design Issues*, 8(2), 5-21.
- Gardner, R. C. (1983). Learning another language: A true social psychological experiment. *Journal of Language and Social Psychology*, 4(2, 3 & 4), 219-239.
- MacIntyre, P. D., Babin, P. A., & Clément, R. (1999). Willingness to communicate: Antecedents & consequences. *Communication Quarterly*, 47(2), 215-229.



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My presentation provided an explanation of the problem of L2 WTC and proposed design thinking inspired projects as one possible solution. I hoped that at the end of the presentation, the attendees had a better understanding of the mechanisms behind this type of pedagogy and were curious about trying it out for themselves. In addition to the presentation itself, I also produced a booklet of design thinking resources to share with attendees. I wanted to provide educators with some concrete examples of projects that incorporated elements of design thinking to varying degrees. The booklet of resources transitions gradually from traditional, teacher-led projects to student-led design thinking-based projects. I hope that this will help educators to introduce design thinking into their classrooms in a constructive and productive manner. This booklet is included in chapter 3.

Chapter 3 : Teaching Resources for Design Thinking-Based Projects

I created this booklet of 7 design thinking-based projects with the middle school teacher in mind. As such, the projects are multidisciplinary, relating to communication skills in French as well as themes in at least one other subject area. For example, the project “Allons à l’école” explores the issue of transportation, encouraging students to study social studies topics including demographics, modes of transport, and the impacts of transport on human and environmental health. I wanted to provide not only resources that are ready to use, but also a guide that shows educators how to gradually transition from traditional to completely design thinking-based projects. Thus, the activities are organized from most traditional to more design-thinking oriented, incorporating the explicit instruction of communication skills such as interviewing, concept mapping, and seeking feedback from stakeholders along the way. The attendees of my breakout session presentation were forwarded a digital copy of this booklet to use and adapt freely to their needs.

Promouvoir la communication en salle de classe avec la pensée design

Une ressource pédagogique développée par Jadine Krist

Ce paquet de ressources décrit 7 projets différents inspirés par la pensée design. Ils sont organisés en ordre, du plus « traditionnel » jusqu'au plus flexible. Ils sont appropriés pour la 8^e et la 9^e année immersion, et des groupes de 2-5 élèves. Sentez-vous à l'aise de les partager, les adapter, et les utiliser librement !

Pour toute question, veuillez contacter jadinekrist@gmail.com .

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..a dentophobie (sciences humaines, sciences).....	11
De la ferme à la table (sciences).....	13

Concours de design : Le bloc appartement

Matières ciblées : Les mathématiques (les rapports), le français

Mise en contexte :

Tu travailles comme architecte municipale. La ville a récemment proposé le développement d'un bloc appartement de six 4 ½ identiques pour étudiants. Le terrain réservé pour le bâtiment, situé entre un collège et une réserve naturelle, mesure 10 m x 12 m.

Phase 1 : Faire preuve de l'empathie.

Avec un partenaire, réfléchissez et partagez vos idées d'un appartement idéal. Quelles chambres utiliseriez-vous, et quand? Quels sont les meubles dont vous avez besoin? Créez une liste des meubles « essentiels » pour votre vie quotidienne comme étudiants. Vous avez besoin d'au moins 10 items différents. Utilisez un dictionnaire au besoin.

Phase 2 : Définir.

Avec une recherche Internet, identifiez les mesures des meubles sur votre liste.

Recherchez les distances minimales recommandées entre les meubles et le mur, et pour les corridors, les escaliers et les portes. Recherchez l'épaisseur des murs intérieurs et extérieurs.

Phase 3 : Idéer

À l'aide du papier quadrillé, dessinez un plan d'étage qui compte toutes les chambres et les meubles que vous avez identifiés. Faites sûr que le plan compte un corridor et un escalier pour se rendre au lobby! Le plan d'étage complet doit mesurer 10 m x 12 m ou moins. Écrivez les mesures et calculez l'aire de chaque pièce.

*Cette étape marcherait bien avec l'enseignement explicite des conversions de mesures et de rapports avec du papier quadrillé.

Phase 4 : Prototyper

Dépendamment des ressources disponibles, créez un modèle 3-D de votre appartement avec un logiciel comme planner5d.com, ou avec du papier et du carton.

Écrivez une proposition de votre plan d'étage qui souligne les faits saillants et les avantages de votre design. Vous allez présenter la proposition devant un comité de juges, alors utilisez un langage persuasif !

*Cette étape marcherait bien avec l'enseignement explicite des adjectifs et adverbes.

Phase 5 : Tester

À tour de rôle, chaque groupe présentera sa proposition et son modèle à l'orale. Tous les élèves dans notre classe auront l'occasion de poser des questions après chaque proposition. Vous allez évaluer chaque plan d'étage et voter pour 3 de vos plans préférés (tu ne peux pas voter pour toi-même!). Les trois groupes avec le plus de points recevront une petite récompense! Faites attention, car les plans qui ne suivent pas les consignes ou qui ne montrent pas les calculs seront disqualifiés.

Projet : L'éolienne flottante

Matières ciblées : Les sciences, le français

Mise en contexte :

C'est l'an 2040. Le ministre de ressources naturelles et développement de l'énergie a présenté aujourd'hui la mise à jour du plan énergétique au Parlement à Fredericton.

« Nous sommes fiers d'annoncer que notre province poursuit le développement d'un parc éolien d'ici 2045 », dit-il lors d'une conférence de presse. « Il est important de reconnaître que l'énergie renouvelable nous permettra de sécuriser un avenir sain pour nous et nos enfants. Par contre, nous comprenons que notre population, qui est en plein croissance, exige une utilisation intelligente de nos espaces. C'est pour cette raison que nous panifions poursuivre la construction d'un parc éolien flottant – sur l'eau. De cette manière, on ne va pas perdre du terrain important aux structures. En même temps, on va pouvoir profiter des vents plus forts en mer ».

Tu travaille en équipe en tant qu'ingénieur. Ensemble, vous allez faire avancer le projet étape par étape, y compris la recherche et la planification.

Phase 1 : Faire preuve de l'empathie.

Visualisez la vidéo suivante pour mieux comprendre le concept d'un parc éolien flottant.

<https://www.youtube.com/watch?v=xbdUlfYCRwc&t=1s>

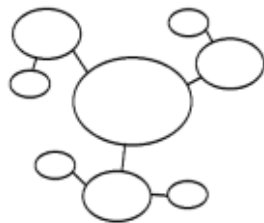
Puis, créez un sondage d'au moins 5 questions ouvertes pour mieux comprendre la réaction des habitants d'une ville à ce développement. Mettez-vous à leur place – qu'est-ce qui serait important à savoir à propos du projet? L'apparence, le bruit, etc.?

Tu vas sonder deux personnes en dehors de la salle de classe (parents, gardiens, frères, sœurs, amis, etc.) et partager tes réponses parmi les membres de ton groupe.

*Cette étape marcherait bien avec l'enseignement explicite de questionnement; qu'est-ce qui est une question ouverte vs. question fermée, quel choix de mots suscitera une réponse profonde, etc.

Phase 2 : Définir.

Rassemblez les réponses des sondages avec les membres de votre groupe dans une toile d'empathie. Identifiez des thèmes principaux que vous voyez.



*Cette étape marcherait bien avec l'enseignement explicite d'organisation d'idées avec un organisateur graphique.

Phase 3 : Idéer

Partie A.

À l'aide de la toile d'empathie et windy.com et Google Maps, choisissez un endroit au N-B pour installer le parc éolien. Quelques considérations...

- Des vents forts
- Proximité d'un ville/village (pour des potentiels employés)
- Près d'autoroutes (livraison du matériel)
- Vos propres idées!

Partie B.

Pas dans ma cour!

Afin d'éviter que les gens dans le village choisi se fâchent, il faut les aider à comprendre le projet.



Tourne une publicité qui explique pourquoi l'endroit que tu as choisi est idéal pour le parc. Explique comment fonctionne une éolienne avec une animation ou une affiche. Finalement, propose deux avantages de cette forme d'énergie et réponds à deux préoccupations possibles des citoyens.

Phase 4 : Prototyper et tester

Avec le matériel fourni (des bouteilles, des cannettes, des pailles, de la styromousse, du carton et des feuilles de papier), concevez et construisez un modèle d'une éolienne flottante. Durant la phase de construction, venez le tester avant le ventilateur dans le bassin d'eau.

Projet : Bienvenue chez vous

Matières ciblées : Les sciences humaines, le français

Mise en contexte :

Le Nouveau-Brunswick a accueilli plus d'immigrants au cours des deux dernières années que jamais auparavant. Ces immigrants-là arrivent avec de divers besoins. Chercher des emplois, trouver une place dans les écoles, trouver un logement... Ce n'est pas un parcours facile, surtout pour ceux et celles qui ont aussi besoin d'apprendre l'anglais ou le français peu après leur arrivée.

En équipe, vous allez rechercher et mieux comprendre les expériences des immigrants à la province. Après avoir acquis une meilleure compréhension des enjeux auxquels ils font face, vous allez développer et prototyper une solution qui servira à soutenir une douce transition.

Phase 1 : Faire preuve de l'empathie.

Option #1. Individuellement, développe 4-5 questions ouvertes pour interviewer un élève ou un membre de la communauté qui a immigré à la province (récemment ou pas). Tu cherches à mieux comprendre son expérience, y compris les émotions, les attentes, et les enjeux auxquels il fait face.

Option #2. Écoute le reportage « Six mois pour apprendre le français » par Radio Canada. Lien : <https://www.youtube.com/watch?v=bKHKnRnL2m8&t=29s>

Choisi un personnage à suivre. Écris un compte-rendu de ses expériences au Québec durant le reportage. Quels sont les hauts et les bas que l'équipe a décidé de montrer? Comment aurais-tu réagi si tu étais à sa place?

Phase 2 : Définir.

Vous travaillerez en groupes de 2-5 personnes. Partagez vos observations et vos notes. Ensemble, discutez les enjeux et les défis que vos invités avaient partagés. Considérez les contraintes du projet, dont l'accès aux ressources et le temps. Définissez un enjeu à travailler.

Phase 3 : Idéer

Comme groupe, proposez des solutions possibles. Quels sont les contacts dans la communauté qui pourraient s'intéresser à vos idées? Contactez-les aussitôt que possible pour leur expliquer le projet. Ils seront importants pour la dernière phase, « tester », où nous les inviterons donner de la rétroaction pour votre groupe !

Phase 4 : Prototyper

Travaillez un modèle et une description de la solution. Dépendamment de ce que vous proposez, ceci pourrait s'agir d'un horaire d'activités au centre communautaire, une application de rencontres pour amis ou pour perfectionner la langue, ou une série de vidéos sur Youtube qui montrent comment naviguer la ville, par exemple- les options sont illimitées !

Phase 5 : Tester

Pour cette phase, on invitera les parents, les membres de la communauté et surtout les organisations ou les individus identifiés lors de la phase « idéer » pour un partage de vos prototypes. Le symposium se fera par carrousel, ou le monde sera libre à circuler parmi vos stations.

Projet : Une tempête s'en vient

Matières ciblées : Les sciences humaines, les sciences, le français

Mise en contexte :

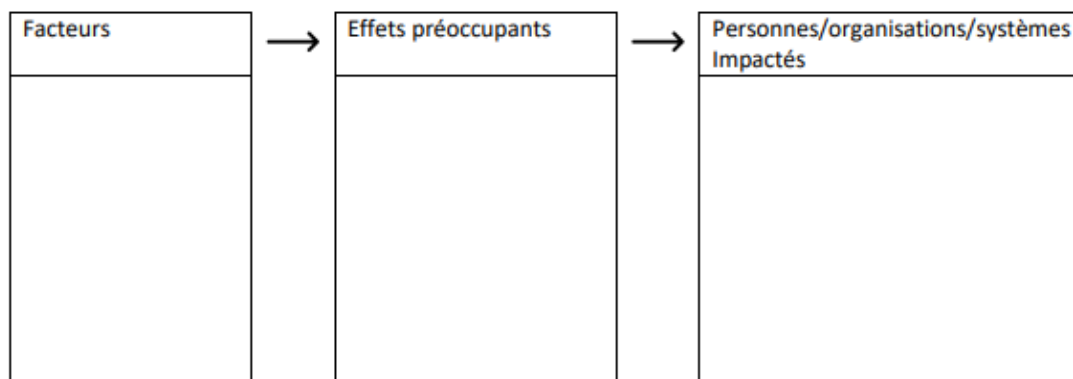
Les changements climatiques qui développent sur la planète créent des conditions météorologiques plus extrêmes et violentes. Ces changements ont un impact important sur la santé et sécurité des tous les êtres vivants. Rechercher ces problèmes, c'est le premier pas vers la préparation.

Phase 1 : Faire preuve de l'empathie.

Choisi une section du document intitulé « Les aléas affectés par les changements climatiques : effets sur la santé, vulnérabilités et mesures d'adaptation : Synthèse des connaissances » publié par l'Institut national de santé publique du Québec. Par exemple, section 7.2, « Les effets de la pollution de l'air ambiant sur la santé ».

<https://www.inspq.qc.ca/sites/default/files/publications/2771-aleas-changements-climatiques-effets-sante-vulnerabilite-adaptation.pdf>

Comme groupe, lisez la section et résumez les effets principaux dans la deuxième boîte de l'organisateur graphique montré ci-dessous.



Analysez la situation et discutez-en. Quels sont les facteurs qui contribuent à ces effets? Considérez les facteurs mentionnés dans le rapport ainsi que d'autres possibilités. Par exemple, l'asthme peut être affecté par la pollution de l'air ambiant produite par les véhicules, mais aussi par le pollen, la température, la proximité aux espaces verts vs. les centre urbains, etc. Remplissez la première boîte avec vos idées et votre recherche.

Considérez les impacts que ces effets préoccupants auront sur les gens, les institutions, les systèmes, etc. Essayer de penser aux « effets de vagues ». Par exemple, si les femmes enceintes sont affectées, est-ce que ceci aura un impact sur les réseaux de santé? Est-ce que ceci affecter leur santé mentale et leur capacité de soigner leurs enfants plus tard?

Phase 2 : Définir.

Réfléchissez sur les « pistes » des causes et des effets que vous voyez dans l'organisateur graphique. Choisissez une piste que vous aimerez travailler.

Phase 3 : Idéer

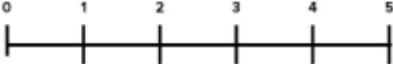


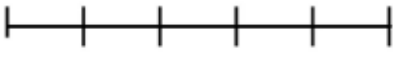
Pensez aux solutions possibles qui pourraient aider à réduire ou sensibiliser les gens aux facteurs, ou qui pourraient répondre ou soulager les impacts sur les personnes. Essayez de cibler un aspect du problème qui est spécifique et faisable étant donné les contraintes du projet.

Phase 4 : Prototyper

Développez un modèle ou une maquette de votre solution, ainsi qu'un produit qui explique l'enjeu, comme un reportage, un article, ou une affiche.

Phase 5 : Tester

Votre groupe sera jumelé avec un autre groupe pour présenter et donner de la rétroaction sur vos solutions. Tout le monde remplira le formulaire suivant.

Je comprends bien l'enjeu, y compris les facteurs qui contribuent aux conséquences négatives sur une population.	
Je vois comment la solution proposée aura un impact positif sur un aspect de l'enjeu.	
La solution tient compte de toutes les parties prenantes identifiées lors de l'enquête.	
La solution semble réaliste. L'équipe est consciente des obstacles, telles que le financement et la résistance sociale, et propose des options pour les approcher.	
Quelques questions que j'avais pour l'équipe sont...	

Après un échange de rétroaction, vous allez revisiter et faire des ajustements avant une présentation finale devant la classe.

Projet : Allons à l'école

Matières ciblées : Les sciences humaines, le français

Mise en contexte :

Beaucoup d'élèves au Canada passent un temps considérable à voyager à l'école. Ce trajet peut se faire par autobus, par voiture, ou à pied ou à vélo. Le choix de mode de transport, ainsi que la durée et le choix de route, entraîne des conséquences sur les élèves, leurs familles, et toute la communauté! Par exemple, un mode de transport sédentaire est connu pour ses effets négatifs sur la santé mentale et physique des élèves. Comment peut-on changer notre façon d'y aller pour le bon?

Phase 1 : Faire preuve de l'empathie.

Comme groupe, choisissez une autre classe dans l'école à étudier. Vous allez développer et mener un sondage qui vous aidera à comprendre les expériences du trajet entre l'école et la maison. Quels moyens de transport sont utilisés? Comment est-ce que le transport affecte l'humeur et la santé physique des élèves? Quels sont les frustrations liées aux certains moyens de transport? Avec vos questions, vous cherchez à comprendre un aspect difficile de l'expérience que vous seriez capable d'améliorer.

Phase 2 : Définir.

Consolidez les réponses des sondages. Vous pouvez choisir d'employer un organisateur graphique pour vous aider. Comme groupe, définissez quelques problématiques qui sortent du lot. Choisissez-en un que vous voulez travailler.

Phase 3 : Idéer

Proposez autant de solutions possibles que vous pouvez. Dépendamment du problème, ceci pourrait être un produit, une nouvelle route, un nouveau véhicule ou une adaptation pour un véhicule existant, par exemple.

Phase 4 : Prototyper

Créez un modèle ou une maquette de votre solution. Ensuite, développez un produit qui explique comment fonctionne la solution. Vous aurez le choix de préparer une publicité ou une affiche pour expliquer votre processus. Gardez en tête l'âge des enfants que vous avez sondé, et concevez le produit avec un langage qui leur convient.

Phase 5 : Tester

Les solutions seront présentées lors d'un symposium à la cafétéria. Les autres classes seront invitées à faire le tour.

Projet : La dentophobie

Matières ciblées : Les sciences humaines, les sciences, le français

À peu près de 15% de la population souffrent de l'anxiété dentaire ; ça veut dire, la peur d'aller voir le dentiste. La recherche suggère que les portraits négatifs du cabinet dentaire dans les médias ainsi que les expériences traumatisantes en sont des causes majeures. Cette situation pose de problèmes pour les patients comme les dentistes, surtout quand la phobie devient si importante que les patients évitent le traitement pendant des longs bouts de temps. La santé dentaire fait partie intégrale du bien-être. Qu'est-ce qu'on peut faire pour minimiser les effets de l'anxiété dentaire et soigner les gens qui en souffrent?

Phase 1 : Faire preuve de l'empathie.

En tant que groupe, ciblez un groupe d'âge; les enfants (4-12), les adolescents (13-18), les adultes (19-65), ou les personnes âgées (65+). Chaque membre de ton groupe va interviewer quelqu'un dans ce groupe d'âge pour mieux comprendre ses expériences jusqu'à présent, ses impressions, et les sources des inquiétudes reliées au dentiste. Vous allez créer une liste d'au moins 8 questions pour tout le monde à poser pendant vos entrevues.

Phase 2 : Définir.

Discutez les réponses de vos entrevues avec votre groupe. Est-ce qu'il y a des thèmes qui ressortent? À l'aide d'un organigramme, définissez les « pistes » variés d'événements et des pensées qui mènent aux sentiments d'angoisse ou de l'inconfort.



Phase 3 : Idéer

Basé sur les thèmes illustrés dans l'organigramme, proposez des solutions possibles qui pourraient aider à réduire l'anxiété pour certains patients. Soyez créatif ! Vous pourriez faire un podcast relaxant, écrire une histoire pour enfants qui expliquent les procédures, développer un jouet « fidget », etc. Il n'y a pas de mauvaises suggestions.

Phase 4 : Prototyper

Parmi vos suggestions, choisissez-en une que vous pouvez réaliser avec le matériel et avec les outils qui vous sont disponible.

Phase 5 : Tester

Consultez au moins une fois avec un des participants au sondage. Vous allez lui présenter votre prototype et expliquer son fonctionnement. Avec le tableau ci-dessous, expliquer les résultats de la consultation.

Rétroaction reçu	Changements/améliorations possibles	Produit final

Vous présenterez vos produits finalisés en classe. Vous aurez le choix de le présenter « en direct », ou avec une vidéo.

Projet : De la ferme à la table

Matières ciblées : Les sciences, le français

De nos jours, beaucoup d'ingrédients qui constituent notre alimentation viennent de loin. Pensez aux bananes ou au chocolat, par exemple. Le plus loin que ces produits-là voyagent, le plus grand qui est leur empreinte carbone. C'est-à-dire, le plus que les camions, les navires, et les avions doivent travailler pour transporter ces biens, le plus que leurs émissions contribuent aux changements climatiques.

Et si on poussait plus chez nous? Le jardinage est une solution prometteuse qui offre aux gens un moyen de fournir leurs propres besoins tout en encourageant des interactions positives avec l'environnement. Votre défi? Sensibiliser le monde aux bienfaits du jardinage, et les équiper avec les connaissances et les outils requis pour s'y lancer!

Phase 1 : Faire preuve de l'empathie.

Créez un sondage destiné aux parents, gardiens, ou aux propriétaires d'une entreprise (n'importe qui qui achète de la nourriture régulièrement). Vous allez écrire au moins 5 questions ouvertes qui vous permettront de mieux comprendre leurs habitudes alimentaires et leurs opinions sur le jardinage. Qu'est-ce qui les empêche de l'essayer?

Notez leurs réponses sur papier, ou enregistrez les discussions pour l'analyse plus tard. Posez des questions additionnelles quand vous avez besoin de plus de détails.

Phase 2 : Définir.

Partager vos réponses avec les membres de votre équipe. Avec l'aide d'une table, classez les réponses que vous avez reçu par thème. Discutez ces thèmes; est-ce qu'il y en a qui semblent être plus important que d'autres?

Avec les pages web <http://planthardiness.gc.ca/index.pl?m=11&lang=fr>, <http://planthardiness.gc.ca/index.pl?lang=fr>, et <https://www.plantes.ca/entretien/planter-plantes.html>, explorez votre zone de rusticité locale. Quelles fruits et légumes sont natives à votre zone? Lesquelles feraient un bon point focal de votre projet? Qu'est-ce qui empêche le monde de pousser ces plantes-là?

* Cette étape marcherait bien avec de l'enseignement explicite des zones de rusticité, les besoins différents des plantes, et le cycle de vie d'un fruit ou d'une légume.

Phase 3 : Idéer

Basé sur votre compréhension des limitations ou barrières à l'entrée du jardinage, proposez des solutions possibles au problème. Ceci pourrait s'agir d'un produit, un cours, un club, un service, etc. Essayez de générer autant de solutions qui possible !

Revisitez votre table et évaluez les solutions possibles. Lesquelles répondent mieux aux besoins de votre clientèle ? Choisissez-en une qui serait réalisable comme prototype pour ce projet.

Phase 4 : Prototyper

Créez un modèle ou une maquette de votre solution. Ensuite, développez un produit qui explique comment fonctionne la solution (une affiche, un vidéo, etc.).

Phase 5 : Tester

Nous allons organiser une exposition de solutions et inviter les parents, les gardiens, et d'autres membres de la communauté. Cette exposition vous donnera l'occasion de démontrer, expliquer et/ou partager vos solutions avec les autres.

Chapter 4 : Reflection

My breakout session at the IB Days Atlantic Canada Conference was attended by over 15 teachers, professors, and administrators from across the Atlantic provinces. My presentation recounted my journey as an early-career teacher who used elements of design thinking in activities and projects to improve willingness to communicate in my Grade 8 classroom. I also discussed my literature review on second language WTC to explain how design thinking can create a more encouraging environment for language learners. By giving concrete examples of activities with varying degrees of structure, I emphasized that students can only achieve complete autonomy in design thinking project management after building up skills and experience over time. It was encouraging for me to hear that some of the teachers had been using solution-oriented projects in their classroom for a long time. They shared their positive opinion about this type of pedagogy, with one teacher saying “it’s very rare to see [the students] not engaged” during these types of tasks.

Most of the attendees were involved in teaching IB, and thus had a clear appreciation for inquiry in the classroom. However, several teachers voiced their concern over the demanding workload of IB courses at the secondary level, suggesting that the pace, content, and evaluation requirements of the program made it very difficult to offer these students the time required to fully participate in design thinking challenges. I sympathized with this reality as a former IB diploma student. Within the confines of the diploma program, there is a mandatory multidisciplinary activity called the Group 4 project, in which students from different science disciplines collaborate on a multidisciplinary challenge. Since this project typically takes several days, I suggested

that this might be the best place to introduce the design thinking framework during the diploma years. I also emphasized that the middle years offer an excellent opportunity to embrace design thinking, due to the increased flexibility of the program. The competencies cultivated through design thinking, including increased confidence and better communication skills, are beneficial to students in all aspects of their lives and thus worth developing at all stages of their academic career.

After the session, I engaged in a discussion with a vice principal at an IB high school in New Brunswick and a professor of education from UNB. The vice principal spoke to the merits of the Centre d'Apprendre, the pilot project that I worked in during my first year of teaching. He talked about its implementation at his school, and how it dramatically changed the learning environment in a way that is much more inclusive and enjoyable for students. The professor from UNB and myself expressed our concerns that for some students, such as those who had limited or interrupted schooling, the Centre d'Apprendre failed to provide the structure and explicit instruction required in order for students to progress. The professor explained that making learning enjoyable was often not synonymous with learning that served the students intellectual growth. This conversation reminded me strongly of the conflicting opinions among staff at my school regarding our implementation of the Centre d'Apprendre. Some thoroughly enjoyed the environment and believed that it offered a much-needed change to teaching practices. I found that this was true for some students, but that overall, the Centre d'Apprendre created some significant challenges that we were not equipped to handle, such as the issue of WTC that I discussed in this project. I feel that it is more important than ever to conduct sound research within our classrooms to best understand how to improve the

educational experience for both students and teachers. As the pace of change in the domain of education continues to increase, so does our need to understand how these changes are affecting learning.

The teaching profession in Canada has experienced sweeping changes over the past several years that have called many traditional pedagogical practices into question. The global pandemic, increased dependence on technology, and increased immigration have changed the way we need to teach and learn in virtually every classroom across the country. My experience as an early career teacher working in a pilot project magnified these challenges and propelled me to seek out solutions. By completing my Master's report on this topic, I was able to better understand how design thinking projects offers one pathway of positive change in teaching practices. I feel that many practitioners would benefit from understanding the mechanisms of WTC as well as the potential benefits of design thinking. By diffusing my experience and findings to colleagues and fellow educators, as well as providing concrete teaching materials, I hope that I have equipped others to consider implementing this type of pedagogy into their classroom. Further research and collaboration are needed for educators in New Brunswick and across the country to best respond to the challenges of education today.

References

- Allard, R., & Landry, R. (1998). French in New Brunswick. In J. Edwards (Ed.), *Language in Canada* (pp. 200-223). Cambridge University Press.
- Allen, M., & Bourhis, J. (2009). The relationship of communication apprehension to communication behaviour: A meta-analysis. *Communication Quarterly*, 44, 214-266. <https://doi.org/10.1080/01463379609370011>
- Allemand, M., Steiger, A. E. & Fend, H. A. (2015). Empathy development in adolescence predicts social competencies in adulthood. *Journal of Personality*, 83(2), 229-241.
- Baker, S. C., & MacIntyre, P. D. (2003). The role of gender and immersion in communication and second language orientations. *Language Learning*, 53, 65-96. <https://doi.org/10.1111/0023-8333.00224>
- Baer, J. (2011). *The inquiring mind: On intellectual virtues and virtue epistemology*. Oxford University Press.
- Beatty, M. J., Heisel, A. D., Lewis, R. J., Pence, M. E., Reinhart, A., & Tian, Y. (2011). Communication apprehension and resting alpha range asymmetry in the anterior cortex. *Communication Education*, 60(4), 441-460.
- Bene, R., & McNeilly, E. (2020). Getting radical: Using design thinking to foster collaboration. *Papers on Postsecondary Learning and Teaching*, 4, 50-57.
- Buchanan, R. (1992). Wicked problems in design thinking. *Design Issues*, 8(2), 5-21.
- Burroughs, N. F., McCroskey, V. M., & McCroskey, J. C. (2009). Relationships of self-perceived communication competence and communication apprehension with willingness to communicate: A comparison with first and second languages in Micronesia. <https://doi.org/10.1080/08824090309388821>
- Canadian Parents for French. (2019). *French as a second language enrolment statistics*. <https://cpf.ca/en/files/FSLEnrolement-Stats-2017-2018.pdf>
- Cargile, A. C., Giles, H., Ryan, E. B., & Bradac, J. J. (1994). Language attitudes as a social process: A conceptual model and new directions. *Language & Communication*, 14, 211- 236.
- Chesebro, J. W., McCroskey, J. C., Atwater, D. F., Bahrenfuss, R. M., Cawelti G., Gaudino, J. L., & Hodges, H. (1992). Communication apprehension and self-perceived communication competence of at-risk students. *Communication Education*, 41, 345-360.
- Croucher, S. M. (2013). Communication apprehension, self-perceived communication competence, and willingness to communicate: A French analysis. *Journal of*

- International and Intercultural Communication*, 6(4), 298-316.
<https://doi.org/10.1080/17513057.2013.769615>
- Cuff, B. M. P., Brown, S. J., Taylor, L., & Howat, D. J. (2014). Empathy: A review of the concept. *Emotion Review*, 8(2), 144-153.
<https://doi.org/10.1177/1754073914558466>
- Cui, Z. (2022). The impact of EFL teachers' open-mindedness and immediacy on their social intelligence: A theoretical review. *Frontiers in Psychology*, 13, 1-5.
<https://doi.org/10.3389/fpsyg.2022.872250>
- Davis, C. (1990). What is empathy, and can empathy be taught? *Physical Therapy*, 70(11), 707-711. <https://doi.org/10.1093/ptj/70.11.707>
- Dawbin, B., Sherwen, M., Dean, S., Donnelly, S., & Cant, R. (2021). Building empathy through a design thinking project: A case study with middle secondary schoolboys. *Issues in Educational Research*, 21(2), 440-457.
- Dell'Era, C., Magistretti, S., Cautela, C., Verganti, R., & Zurlo, F. (2020). Four kinds of design thinking: From ideating to making, engaging, and criticizing. *Creativity and Innovation Management* 29(2), 324-244.
- Dwyer, K. K., & Fus, D. A. (2002). Perceptions of communication competence, self-efficacy, and trait communication apprehension: Is there an impact on basic course success? *Communication Research Reports*, 19(1), 29-37.
- Farouck, I. (2016). A project-based language learning model for improving the willingness to communicate of EFL students. *Systemics, Cybernetics, and Informatics*, 4(2), 11-18.
- Foley, T. (2020). Building better together: Exploring Indigenous economic development in New Brunswick report. *Journal of Aboriginal Economic Development*, 12(1), 111-138.
- Foster, M. (2019). Design thinking: A creative approach to problem solving. *Management Teaching Review*, 6(2), 108-189.
<https://doi.org/10.1177/2379298119871468>
- Gardner, R. C. (1983). Learning another language: A true social psychological experiment. *Journal of Language and Social Psychology*, 4(2, 3 & 4), 219-239.
- Genesee, F. (1994). Integration language and content: Lessons from immersion. *National Center for Research on Cultural Diversity and Second Language Learning Educational Practice Report: 11*.
- Gérin, P. M. (1983). La création d'un troisième code comme mode d'adaptation à une situation où deux langues sont en contact : le chiac. Papers from the Annual Meetings of the Atlantic Provinces Linguistic Association (PAMAPLA) Actes

- des colloques annuels de l'Association de linguistique des province Atlantiques (ACAALPA), 7, 31–38.
- Goldman, S., & Zielezinski, M. B. (2022). Design thinking for every classroom. *Taylor & Francis*.
- Government of New Brunswick. (2021). Summary statistics: School year 2020 – 2021. *Policy & Planning Division, Department of Education and Early Childhood Development*.
- Griffiths, N. (1993). Acadian identity: The creation and re-creation of community. *Dalhousie Review*, 73(3), 325-249.
- Hamm, L. D., Bragdon, M., McLoughlin, J., Massfeller, H., & Hamm, L. A. (2021). Diversity, growth, and understanding: School responses to immigration in rural New Brunswick. *Canadian Journal of Educational Administration and Policy / Revue Canadienne en administration et politique de l'éducation*, 197, 2-27. <https://doi.org/10.7202/1083330ar>
- Harris, K. H., & Alexander, P. A. (1998). Integrated, constructivist education: Challenge and reality. *Educational Psychology Review*, 10, 115-127.
- Henriksen, D., Richardson, C., & Mehta, R. (2017). Design thinking: A creative approach to educational problems of practice. *Thinking Skills and Creativity*, 26, 140-153. <https://doi.org/10.1016/j.tsc.2017.10.001>
- Hasso Plattner Institute of Design at Stanford University. (2024, 02, 01). *Get Started With Design*. Stanford D School. <https://dschool.stanford.edu/resources/get-started-with-design>
- Hope, G. (2000). Beyond draw one and make it. *The Journal of Design and Technology Education*, 6(3), 197-201.
- Horwitz, E. K., Horwitz, M. B., & Cope, J. (1986). Foreign language classroom anxiety. *The Modern Language Journal*, 70(2), 125-132.
- Imura, T. (2004). The effect of anxiety on oral communication skills. In B. Bartlett, F. Bryer, & D. Roebuck (Eds.), *Education: Weaving Research into Practice: Volume 2* (pp. 174-86). Griffith University, School of Cognition, Language and Special Education.
- International Baccalaureate. (2013). *IB learner profile* [Pamphlet]. International Baccalaureate Organization.
- Jenkins, J. (2007). English as a lingua franca: Attitude and identity. *Oxford Applied Linguistics*.
- Kaiju, K. (2013). Design thinking in elementary students' collaborative lamp designing process. *The Journal of Design and Technology Education*, 18(1), 30-43.

- Kaplowitz, D. (1967). Teaching empathic responsiveness in the supervisory process of psychotherapy. *Journal of Psychotherapy*, 4, 774-781.
- MacIntyre, P. D. (2007). Willingness to communicate in the second language: Understanding the decision to speak as a volitional process. *The Modern Language Journal*, 91, 564-576.
- MacIntyre, P. D. (2020). Expanding the theoretical base of the dynamics of willingness to communicate. *Studies in Second Language Learning and Teaching*, 10(1), 111-131.
- MacIntyre, P. D., Babin, P. A., & Clément, R. (1999). Willingness to communicate: Antecedents & consequences. *Communication Quarterly*, 47(2), 215-229.
- MacIntyre, P. D., Baker, S. C., Clément, R., & Donovan, L. (2003). Sex and age effects on willingness to communicate, anxiety, perceived competence, and L2 motivation among junior high school French immersion students. *Language Learning* 53(S1), 137-166.
- MacIntyre, P. D., Clément, R., Dörnyei, Z., & Noels, K. A. (1998). Conceptualizing willingness to communicate in a L2: A situational model of L2 confidence and affiliation. *The Modern Language Journal*, 82(4), 545-562.
- MacIntyre, P. D., Noels, K. A., & Clément, R. (1997). Biases in self-ratings of second language proficiency: The role of language anxiety. *Language Learning*, 47(2), 265-287.
- Marshall, S. L., Ciarrochi, J., Parker, P. D., & Sahdra, B. K. (2019). Is self-compassion selfish? The development of self compassion, empathy, and prosocial behaviour in adolescence. *Journal of Research on Adolescence*, 30(s2), 472-484.
- McCroskey, J. C. (1976). The problems of communication apprehension in the classroom. *The Florida Speech Communication Journal*, 4, 1-12.
- McCroskey, J. C. (1977). Oral communication apprehension: A summary of recent theory and research. *Human Communication Research*, 4(1), 78-96.
- McCroskey, J. C. (1992). Reliability and validity of the willingness to communicate scale. *Communication Quarterly*, 40(1), 16-25.
- McCroskey J. C., & Baer, J. E. (1985). Willingness to communicate: The construct and its measurement. *Journal of Applied Communication Research*, 13, 265-278.
- McCroskey J. C., & McCroskey, L. L. (1988). Self-report as an approach to measuring communication competence. *Communication Research Reports*, 5(2), 108-113.
- McCroskey, J. C., & Richmond, V. P. (1987). Willingness to communicate. In J. C. McCroskey, & J. A. Daly (Eds.), *Personality and Interpersonal Communication* (pp. 129-156). SAGE Publications.

- McCroskey, J. C., & Richmond, V. P. (1990). Willingness to communicate: A cognitive view. *Journal of Social Behavior and Personality*, 5, 19-37.
- McCurdy, R. P., Nickels, M. L., & Bush, S. B. (2020). Problem-based design thinking tasks: Engaging student empathy in STEM. *Electronic Journal for Research in Science & Mathematics Education*, 24(2), 22-55.
- Mitchell, R., Parker, V., & Giles, M. (2012). Open-mindedness in diverse team performance: investigating a three-way interaction. *The International Journal of Human Resource Management*, 23(17), 3652-3672.
- Nadeem, M. U. Adnan M., & Zabrodskaia, A. (2023). The role of positive and negative emotions in shaping willingness to communicate in a second language: Self-perceived communicated competence as a moderator. *Education Sciences*, 12(8), 823. <https://doi.org/10.3390/educsci13080823>
- Noels, K. A. (2013). Self, identity and motivation in the development and maintenance of German as a heritage language. In K. Arnett & C. Mady (Eds.), *Minority population in Canadian second language edition* (pp. 71-86). Multilingual Matters.
- Norman, J. (2001). Design as a framework for innovative thinking and learning: how can design thinking reform education? In E. W. Norman & P. H. Roberts, (Eds.), *Design and technology educational research and curriculum development: the emerging international research agenda* (pp. 90-99). Loughborough University.
- Owen, C. (2007). Design thinking: Notes on its nature and use. *Design Research Quarterly*, 2(1), 16-27.
- Paulus, P. B., Coursey, L. E., & Kenworthy, J. B. (2018). Divergent and convergent collaborative creativity. In I. Lebuda, & V. P. Glaveanu (Eds.), *Palgrave Handbook of social creativity* (pp. 245-262). Springer International Publishing.
- Qinghe, Z. (2024). Relationships among willingness to communicate, self-perceived communication competence and communication anxiety. *Global Academic Journal of Linguistics and Literature*, 6(2), 69-77. 10.36348/gajll.2024.v06i02.005
- Razzouk, R., & Shute, V. (2012). What is design thinking and why is it important? *Review of Educational Research*, 82(3), 330-348. <https://doi.org/10.3102/0034654312457429>
- Richmond, P., McCroskey, J. C., & McCroskey, L. (1989). An investigation of self-perceived communication competence and personality orientations. *Communication Research Reports*, 6(1), 28-36.

- Rittel, H. W. J., & Webber, M. M. (1973). Dilemmas in a general theory of planning. *Policy Sciences*, 4, 155-169.
- Ryan, E. R. (1983). Social psychological mechanisms underlying native speaker evaluations of non-native speech. *Studies in Second Language Acquisition*, 5(2), 148-159. <https://doi.org/10.1017/S0272263100004824>
- Silke, C., Brady, B., Boylan, C., & Dolan, P. (2018). Factors influencing the development of empathy and pro-social behaviour among adolescents: A systematic review. *Children and Youth Services Review*, 94, 421-436.
- Shuck, G. (2009). Racializing the nonnative English speaker. *Journal of Language, Identity & Education*, 5(4), 259-276. https://doi.org/10.1207/s15327701jlie0504_1
- Stern, J., & Cassidy, J. (2018). Empathy from infancy to adolescence: An attachment perspective on the development of individual difference. *Developmental Review*, 47, 1-22. <https://doi.org/10.1016/j.dr.2017.09.002>
- Welch, M. (1998). Students' use of three-dimensional modeling while designing and making a solution to a technical problem. *International Journal of Technology and Design Education*, 8, 241-260.
- Werle, D., Winters, K. L., & Byrd, C. T. (2021). Preliminary study of self-perceived communication competence amongst adults who do and do not stutter. *Journal of Fluency Disorders*, 70. <https://doi.org/10.1016/j.jfludis.2021.105848>
- Wigfield, A., Eccles, J. S., Mac Iver, D., Reuman, D. A., & Midgley, C. (1991). Transitions during early adolescence: Changes in children's domain-specific self-perceptions and general self-esteem across the transition to junior high school. *Developmental Psychology*, 27(4), 552-565. <https://doi.org/10.1037/0012-1649.27.4.552>
- Yilmaz, G. (2021). Revitalizing the communication classroom: A case of design thinking. *Communication Teacher*, 36(3), 216-233.

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