International Journal for Talent Development and Creativity

Thinking Preference Awareness, Leadership Skills and Learning Behaviour

Christine Boyko-Head

Citer cet article

Résumé de l'article

Prior to Covid-19, studies identified a gap between the skills employers needed and the skills graduates had (IBM, 2012, 2016, WEF2016b). Still impacted by the pandemic, graduating classes of the future may not be any different. This paper shares findings from an Applied Research in Innovation and Education (ARIE) pilot project conducted between 2016-2017 at Mohawk College, Ontario Canada with 117 students enrolled in a 14week, mandatory Communications course. Specifically, the pilot project explored perceptions of leadership, employability skills and attributes in post-secondary students and how they perceived and assessed their leadership skills and developmental needs for future employment. The study also examined how learner awareness of their own and others thinking preferences when problem-solving impacted their academic behaviours and development goals. The aim was to determine the impact thinking preference awareness in learners might have on their communication, collaboration, and development of personal and professional learning targets. Using a mixed-methods, transformative-emancipatory critical approach, the research highlights the classroom as a living laboratory rich in emergent research questions and revealed additional areas of research regarding thinking preference theory and language, self-differentiated learning and inclusive, learner-focused curriculum design.

Thinking Preference Awareness, Leadership Skills and Learning Behaviour

Christine Boyko-Head

Mohawk College of Applied Arts and Technology, Hamilton, Canada

Abstract

Prior to Covid-19, studies identified a gap between the skills employers needed and the skills graduates had (IBM, 2012, 2016, WEF2016b). Still impacted by the pandemic, graduating classes of the future may not be any different. This paper shares findings from an Applied Research in Innovation and Education (ARIE) pilot project conducted between 2016-2017 at Mohawk College, Ontario Canada with 117 students enrolled in a 14week, mandatory Communications course. Specifically, the pilot project explored perceptions of leadership, employability skills and attributes in post-secondary students and how they perceived and assessed their leadership skills and developmental needs for future employment. The study also examined how learner awareness of their own and others thinking preferences when problem-solving impacted their academic behaviours and development goals. The aim was to determine the impact thinking preference awareness in learners might have on their communication, collaboration, and development of personal and professional learning targets. Using a mixed-methods, transformative-emancipatory critical approach, the research highlights the classroom as a living laboratory rich in emergent research questions and revealed additional areas of research regarding thinking preference theory and language, self-differentiated learning and inclusive, learner-focused curriculum design.

Introduction

Today's culturally, linguistically and academically diverse learners require experiences that build on learner autonomy, content relevance, a sense of mastery, and a positive sense of community (Burns, 2016; Drapeau, 2014; Freeman, Anderman & Jensen, 2007; Gregory & Kaufeldt, 2015; Hammond, 2015; Yuhas, 2016; Dweck, 2016; Hammond, 2015; Pink, 2009). Yet, the challenge of creating dynamic learning experiences is very real. Daniel Rigney (2010) disparagingly notes that "the cognitively rich will only get academically richer while the cognitively poor will get academically poorer, as small differences in learning abilities such as information processing are allowed to grow into large gaps" (Hammond, 2015, p124). While he is referring specifically to the achievement and opportunity gap facing racialized children in the United States, at the post-secondary level, these gaps, regardless of race, are not magically erased. In fact, they are compounded by large class sizes, passive learning strategies, an under-utilization of formative assessment *as* learning, and an over-reliance on summative assessments of learning.

Further, experimentation into alternative delivery models, such as pre-Covid, online learning and hybrid or blended courses, that are financially efficient, yet pedagogically unsupported, can increase learning gaps. Thus, the educational challenge remains one of creating an educational ecosystem where learning is a dynamic action occurring in *all* learners rather than a passive transference touching only a few.

Fundamental to student success is engagement, collaboration and self-awareness (OECD, 2014). Likewise, the World Economic Forum (WEF) (2016) lists critical thinking, communication, collaboration and creativity as essential skills for mitigating Adamson's (2012) volatile, uncertain, complex, ambiguous (VUCA) employment landscape. *C21: Canada* (2012) identifies that "highly

creative and innovative people are the drivers of the 21st-century" (p13), and that this 21st-century educational imperative recognizes that post-secondary institutions need to educate learners for a future that has not yet been imagined. According to the Programme for International Student Assessment (PISA), as quoted by the OECD (2011), competition among countries now focuses on human capital and a knowledge economy. Graduates need to display leadership skills even in entry level positions. A 2012 IBM study identifies a threatening skill gap between what employers need and graduates have. When these exigent economic and social contexts are combined with a disempowered and disenfranchised learner population, the situation inspires the question of how might learners perceive and assess their own leadership skills and developmental needs for future employment? This question aligns with my own queries into thinking preferences' impact on learner behaviour and developmental indices. Specifically, I wondered how might learners' awareness of their own and others thinking preferences enhance self-directed personal and professional development goals?

Employability skills

Partnership for 21st Century Skills (2017) identifies critical thinking, creativity, communication and collaboration as system-wide learning outcomes. All four skills can be developed; but, critical thinking and creativity foreground a minimizing of the familiar and a maximizing of the diverse that enable and reinforce the attributes that employers are looking for in graduates and leaders (WEF, 2016b; IBM, 2016). This growth-rich learning environment reflects the diversity in classroom demographics and invites us to ask how might we leverage diversity in order to provide richer learning opportunities that simulate industry's needs?

According to Yorks and Kasl (2002), familiar habits of mind and habits of being are challenged when a group of learners have more diverse perspectives and experiences. They advocate that the possibility for growth and transformation is directly and positively related to the presence of diversity within the classroom. However, the paradox of diversity suggests that cognitive reflection only works when a group is homogenous and shares a sense of knowing through cognitive patterns based on "common experiential grounding" (Yorks & Kasl, p186). While diversity has a great learning potential, according to Yorks and Kasl (2002), it also has a negative shadow: "the more diverse the learners,

the less likely it is that they will be able to create an empathetic field that enables them to understand the other's point of view, thus blocking their capacity to lead each other toward growth and transformation" (p186). To counter this, they suggest that a whole-body affect be implemented by educators through the consistent application of strategies that provide reflective conduits into the " 'felt knowing' of the self and others" (p187). They caution that many of these pathways are arts-based or innovative techniques not valued as part of traditional educational practice.

In this case, the diversity of learners does not encourage a diversity of instruction; the familiar is privileged over creative strategies that stretch the definition of education. As a result, cognitive, social and emotional learning opportunities are being overlooked in some, if not all, learners. Likewise, since problem-solving requires risk-taking and iteration, a risk-averse educational milieu short-changes learners on creative, critical thinking practice and development. Indeed, reliance on summative testing privileges perfection over iteration. Thus, the failure in promoting critical and creative thinking leads me to ask, again: might an awareness of thinking preferences help learners' self-select the personal and professional competencies needed for their future success?

Thinking preference theory

Before diving into the research let's review the Creative Problem-Solving (CPS) model and its four stages of thinking. Depending on the task, problem-solving requires a clarifying of the problem, ideating solutions to the problem, developing a workable solution, and implementing the developed solution in the real world. Thinking preferences (TP) highlight the individual's cognitive predilections and bias for specific stages of CPS when solving simple to complex tasks. It notes that differences in problem-solving stem from different mental processes rather than different personal

features (Puccio, Miller, Acar, 2018; Puccio & Acar, 2015). Seeing thinking preferences as an inclination, an energized state and a default choice, educators can reverse fixed mindsets that are based on a prioritizing of certain abilities and a privileging of certain personalities and behaviours. Everyone can learn beyond their preference because preference does not equal ability (FourSight, 2014). Yet, while preference may not be linked to ability, abilities are linked to preferences. Areas of deficit can be overcome through education in and practice of preference-specific tools and strategies. It is this final point – the ability to teach proficiency in CPS – despite our individualized proclivities – that makes thinking preference awareness an exciting contribution to differentiated instruction and individualized learning goals. Furthermore, TP's clarity, universality, and judgement-neutral positionality and potentiality makes it adaptable to various educational applications.

During an International Centre for Innovation in Education (ICIE) presentation in Paris (2018), I discussed the potential in providing educators and students with a common, judgement -neutral language in which to describe learning experiences and group interactions. The descriptors associated with each TP phase has the potential to shift teacher bias and its "deficit-focused language to asset-based discourse" (Hammond, 2015, p154). A common example would be the assumption by educators that students who are not 'actively participating' – indicated by verbal inactivity – are disengaged, uninterested, complacent, lazy or 'slow'. Covid-19's online learning only accentuated this assumption. But educators have always been poor judges of what constitutes learner engagement, (Hammond, 2015), especially since they often observe their classrooms through a biased lens (Gurak-Ozdemir, 2019). So, rather than default to deficit-laden language that shows a bias toward certain learning behaviour, educators could use the judgement-neutral language of thinking preferences that presents non-verbal student behaviour as reflective, introspective, methodical, cautious, rather than disengaged. Describing classroom behaviour with TP language avoids teacher bias' and the assumptions around the appropriate semiotics of learning by explaining the behaviour through the empathetic lens of the particular learner's thinking preference profile as opposed to the preferences of 'louder', supposed ideal, students. This shift leads to a shift in perspective was based on my assertion that an awareness and application of TP and CPS may have the very real potential to transform the classroom into a safe, reflective, inclusive, empathetic ecosystem for all learners.

Area of focus

The 2016-17 project explored how we might create a positive learning environment that encourages learner autonomy and responsibility in all students as they develop 21st Century competencies. Significantly, the pilot explored how increased self-awareness regarding one's TP and CPS process might contribute to better communication, collaboration and the development of empathetic leadership perspectives in students. I also wanted to see if TP awareness might help learners interact with each other from a more empowered, empathetic and effective position. The research explored potential correlations between thinking preferences, learning behaviours, and perceptions of leadership skills. Quantitative and qualitative evidence showed that TP awareness enhanced learners' inter- and intra-personal communication, empathetic collaboration, and self-directed, personal and professional development.

Method

This pilot used a mixed methods approach combining quantitative assessments and surveys with qualitative observations, discussions and reflections. It was philosophically framed through a critical social science lens informed by transformative-emancipatory, critical pedagogy that is action-oriented. This pedagogical approach makes power structures transparent in order to empower learners as it invites them to become co-researchers, co-creators, co-activists by inviting them to "examine critically their beliefs, values, and knowledge with the goal of developing a reflective knowledge base, an appreciation for multiple perspectives, and a sense of critical consciousness and agency" (Ukpokodu, 2009). Inspired by Freire's *Pedagogy of the Oppressed,* the pilot aimed to advance approaches to teaching and learning and to empower participants to transform themselves by providing them "with a resource that will help them understand and change their world" (Neuman,

2000). This transformative imperative is also what makes it an emancipatory experience freeing learners from an institutionalized structure that sees deficits rather than strengths.

The project involved 117 Mohawk College students. 83.5% were between the age of 19-27. It was conducted between September of 2016 - April, 2017, covering two college semesters. In phase one, quantitative data collection included a pre-assessment online survey linked to the FourSight TP online assessment. The pre-assessment used a five-level Likert scale. The leadership section included the following labels: 1 = not at all important, 3= somewhat important, 5 = very important. The learning behaviour profile used a five-level Likert scale with the same labels as above, as well as 1= strongly disagree, 3= neither agree nor disagree, 5= strongly agree, and 1= a lot of discomfort, 3= some discomfort, 5= no discomfort at all. Some questions required a yes/no response with open commentary. All participants were invited to a follow-up Thinking Preference workshop. The workshop followed a constructivist approach to delivering TP theory and a threefold follow-up data-gathering procedure comprising of 1) an individual, arts-based activity, 2) a collaborative, arts-based task, and 3) a whole-group debrief of each event. The impact and transferability of TP language to students' learning contexts was measured through reflective writings done by participants (N=66) in a Communications class eight weeks later.

General findings

The pre-assessment survey involved 117 Mohawk College students across four schools: Applied Health, Engineering and Skilled Trades, Community, Justice and Liberal Studies, Business, Media and Entertainment. Students were in semesters one to five (Figure 1).
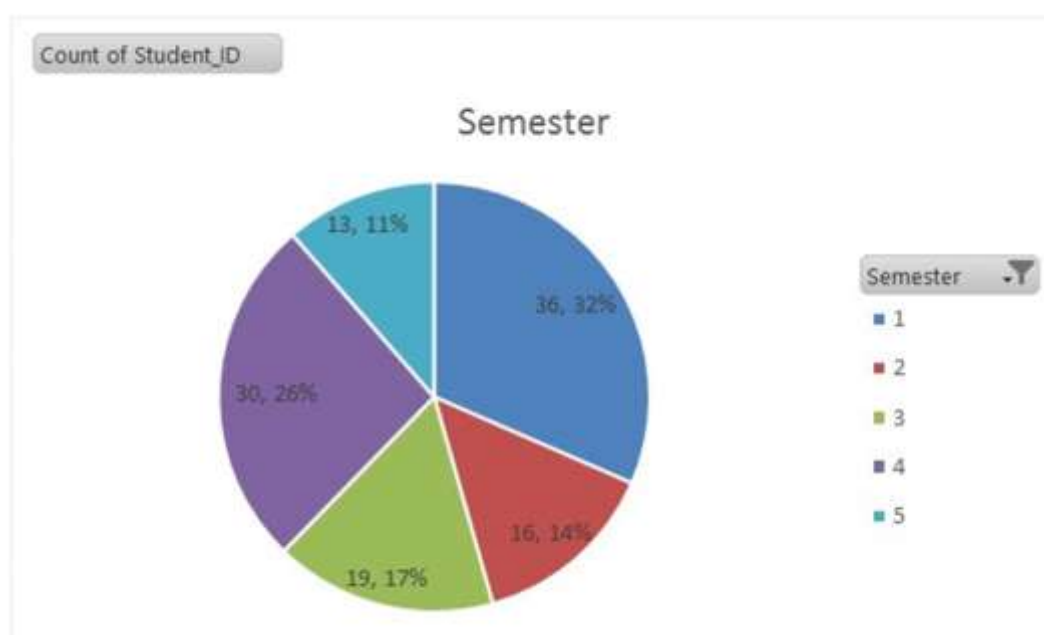
Figure 1: Participants semester of study.

Depending on their program of study, most participants spent 12-16 hours in class (46.5%), 26.7 % spent over 17 hours in class, and 22% spent 7-11 hours in class.

FourSight TP terminology around leadership attributes were used in the survey. Responses regarding attributes that leaders need mirrored research by Puccio & Acar (2015) with 50% selecting the ideating cluster (Figure 2). However, responses regarding attributes leaders do not need countered Puccio & Acar (2015) with 61% selecting the implementing cluster as unnecessary (Figure 2).

Leader needs

A: focused, methodical, skilled analyzer, orderly, organized, serious, skilled at research	32	27.1%
B: imaginative, social, adventurous, independent, adaptable, flexible, big picture thinker	59	50.0%
C: reflective, careful, patient, skilled at details, skilled planner, perfectionist, cautious	19	16.1%
D: persistent, decisive, assertive, action-oriented, trial and error	8	6.8%
Total	118	

Leader doesn't need

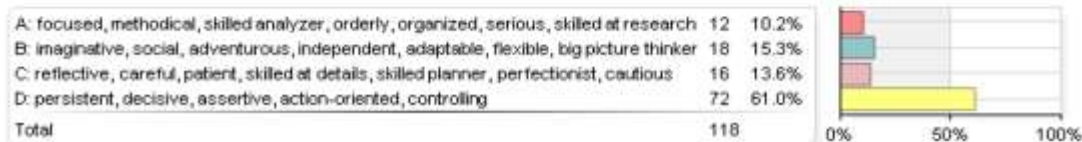|		
A: focused, methodical, skilled analyzer, orderly, organized, serious, skilled at research	12	10.2%
B: imaginative, social, adventurous, independent, adaptable, flexible, big picture thinker	18	15.3%
C: reflective, careful, patient, skilled at details, skilled planner, perfectionist, cautious	16	13.6%
D: persistent, decisive, assertive, action-oriented, controlling	72	61.0%
Total	118	

Figure 2: Qualities leaders need and don't need.

Regarding the development of a quality leader, participants ranked personality (89.9%) as being most important followed by work experience (78%), life experience (77%) and then educational experience (66%) (Figure 3).

The importance of work experience on leaderhsip development aligned with the high value students placed on field placements and co-op opportunities (83%). Personality, work and life experience ranked higher than education as factors contributing to the development of good leaders. This should pose a concern for educators and adminstrators and highlight the need to transform "the old industrial-era engine of schooling" (Reville, 2016, p126) and move toward a model more relevant to current contexts and needs. The result also suggests the necessity for more student autonomy, content relevance and mastery of competencies, and reinforces the argument by educational scholars for problem-based enquiry, experiential learning, Capstone projects and education-industry partnerships that amplify these essentials.

Development of good leader

1. Life experience

1=Not at all important	1	0.9%
2	2	1.7%
3=Somewhat important	23	19.7%
4	35	29.9%
5=Very important	56	47.9%
Total	117	

2. Work / Professional experience

1=Not at all important	1	0.8%
2	4	3.4%
3=Somewhat important	21	17.8%
4	53	44.9%
5=Very important	39	33.1%
Total	118	

3. Educational experience

1=Not at all important	3	2.5%
2	4	3.4%
3=Somewhat important	33	28.0%
4	43	36.4%
5=Very important	35	29.7%
Total	118	

4. Personality

1=Not at all important	0	0.0%
2	2	1.7%
3=Somewhat important	11	9.4%
4	35	29.9%
5=Very important	69	59.0%
Total	117	

5. Family

1=Not at all important	19	16.1%
2	17	14.4%
3=Somewhat important	29	24.6%
4	26	22.0%
5=Very important	27	22.9%
Total	118	

6. Luck

1=Not at all important	38	32.2%
2	36	30.5%
3=Somewhat important	29	24.6%
4	6	5.1%
5=Very important	9	7.6%
Total	118	

7. Financial security

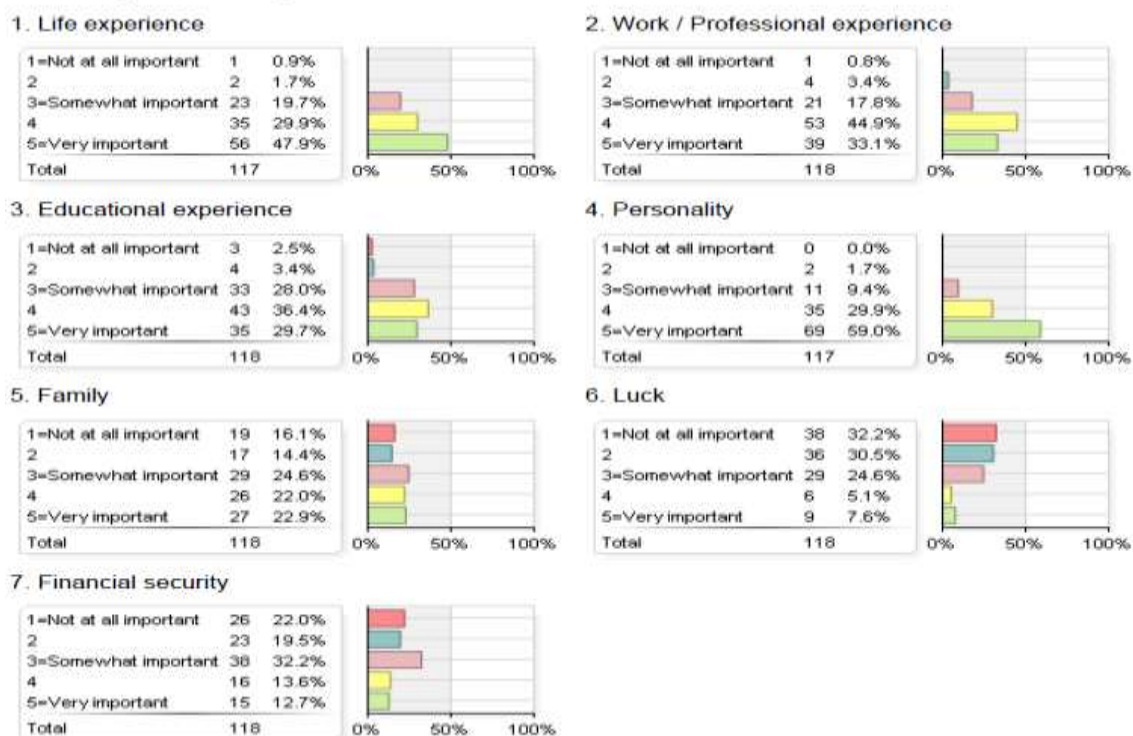|		
1=Not at all important	26	22.0%
2	23	19.5%
3=Somewhat important	38	32.2%
4	16	13.6%
5=Very important	15	12.7%
Total	118	

Figure 3: Factors contributing to the development of a good leader.

Participants indicated that competent and skilled leaders needed to be excellent communicators (72%), followed by excellent collaborators and continuous learners (61%). Critical and creative thinking skills were viewed as strongly needed by only 50% of participants. Considering the research ranking critical thinking and creativity as essential employability skills (WEF, 2016; OECD, 2011; Partnership for 21st Century Skills, 2017), participants' perception of these skills, as well as the low number of ideators in the study, indicates a serious disconnect between the skills industry needs and the skills students *think* they need in order to be employable.

Further, how might the current educational milieu's discomfort with, and subsequent resistance to, teaching and assessing creativity and critical thinking contribute to this disconnect? These are questions that need further consideration and may inspire professional development regarding how to develop, integrate and assess critical and creative thinking across the curriculum.

Participants signified that student-instructor interaction (84%), mentoring (83%) and peer collaboration (82%) were more significant to their development than individual achievement (74%). This suggests that participants value relationships in the learning process. This may influence how we move forward in our technologically-enhanced delivery models and encourage curriculum development to integrate online, community-building processes with content.

Most participants study for an exam or major test 3-5 days before (40.5%), followed by 1-2 days (39.7%), and only 2.6% study less than one day before an exam or major test. However, only 14.7% study more than 5 days before a summative evaluation. Thus, students favour cramming, despite research (Kim, 2017) showing the importance of incremental study habits to long-term memory. However, 24.8% of participants spend more than five days when working on an essay or major project. This may indicate that project-based learning encourages study habits that are more conducive to knowledge retention. Comparing these responses to the work done on working memory, retention and intervention (Fenesi et al., 2014) would be beneficial, especially since responses to the survey questions regarding assessment provided intriguing information about what assessment types did and did not increase stress, anxiety and discomfort in learners.

The pre-survey indicated that many common learning strategies, such as summative assessments, were sources of stress for learners. 70% of those learners surveyed were more stressed over pop quizzes than a final exam (1-3 = 43%), while 57% were anxious about doing group projects. Announcing a group presentation increased the discomfort to 59%, and 61% were more uncomfortable when having to do the presentation alone compared to working with a partner (1-3 = 43.1%). Also, 64.1% indicated they were uncomfortable presenting first, and 59.8% when presenting last, indicating that presenting, overall, caused stress. This reflects the finding by the National Institute of Mental Health stating that 73% of people fear public speaking more than they fear death (2017). Only 37% (1-3) experienced discomfort when asked to write a reflection, and 63% (1-3) felt discomfort when asked to write a 1500-word essay.

These findings suggest that further research into how learning strategies contribute to student stress might examine differences in comfort level between assessment *for* learning, *as* learning and *of* learning. Since presentations seem to be uncomfortable learning practices, a more incremental, cross-curricular, cross thinking preferences approach to presentation skills may be a beneficial, safe way of learning these vital 21st Century skills.

Thinking preference findings

Although FourSight Thinking Preference profiles can identify hybrid styles, participants were categorized into the five main profile types in order to avoid diluting the data. The *n* was reduced to 94 since 23 participants completing the pre-assessment did not complete the FourSight assessment. Figure 4 illustrates the number of TP profiles of all participants with Figure 5 showing the profiles according to academic area.

Participants by Profiles

- Clarifier
- Ideator
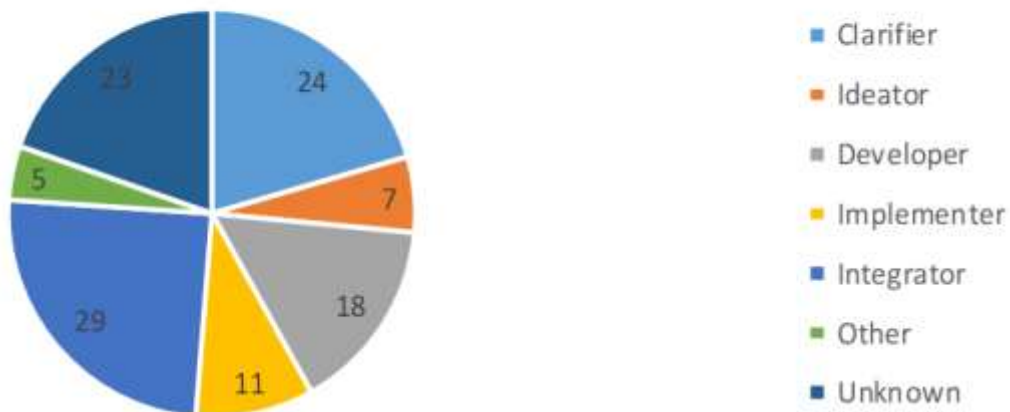- Developer
- Implementer
- Integrator
- Other
- Unknown

Figure 4: Total participants TP profile.

In the study, clarifiers recorded no discomfort working alone and would rather struggle through a problem than work with others. They also preferred to leave a problem they didn't understand for another time. They requested instructor assistance more than did students with any other profile, corresponding to TP research stating clarifiers are the students who ask the most questions (Thurber, 2014). Clarifiers indicated a lot of discomfort in doing group and individual presentations, especially when going first. Only integrators showed a higher level of discomfort when asked to present first. When given three weeks to perform a task, clarifiers showed no discomfort, even when the task was a final exam. This may relate to clarifiers being focused, orderly, organized and deliberate, making methodical studying their optimum learning strategy (FourSight, 2014). In contrast, a pop quiz, characterized as spontaneous and ambiguous, produced a lot of discomfort in clarifiers compared to students with other profiles. Autonomy in assignments was somewhat important to clarifiers, possibly reflecting their preference for explicit instructions rather than vague, open-ended, self-paced tasks.
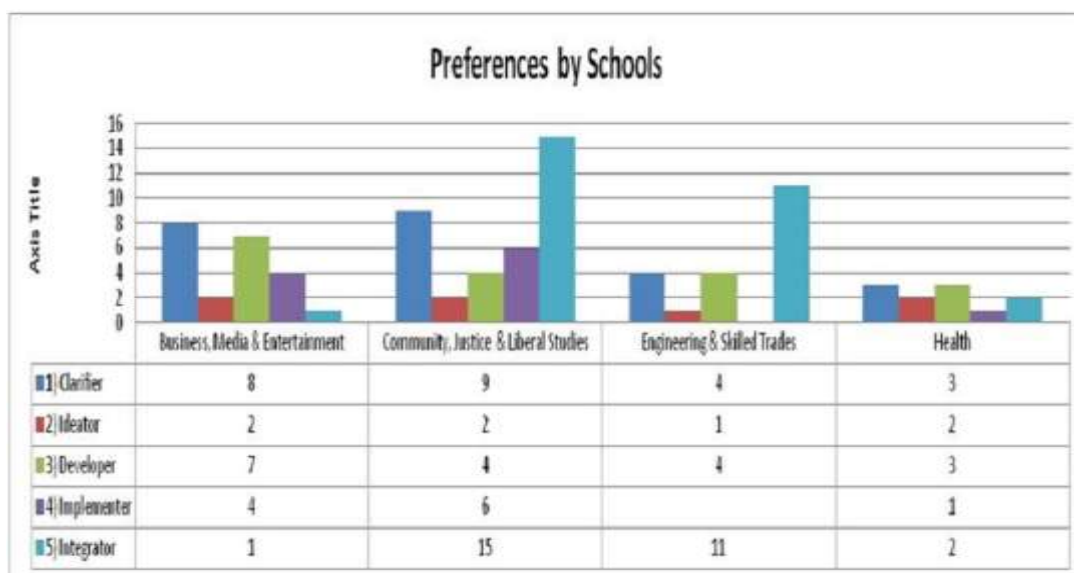

	Business, Media & Entertainment	Community, Justice & Liberal Studies	Engineering & Skilled Trades	Health
1) Clarifier	8	9	4	3
2) Ideator	2	2	1	2
3) Developer	7	4	4	3
4) Implementer	4	6		1
5) Integrator	1	15	11	2

Figure 5: Thinking preferences according to academic schools.

Unlike clarifiers, the ideators ranked collaboration and group work as very important to their learning. Similarly, ideators indicated no discomfort in working with a partner, alone, or doing a group project, reinforcing the profile's flexibility and adaptability. While all profiles were

uncomfortable with pop quizzes, ideators and implementers showed less discomfort than the more detail-oriented profiles. The small number of ideators in this study contradicts thinking preference research (Puccio & Acar, 2015) and may be indicative of education's risk-adverse culture (Eng, 2017; Dweck, 2016; Pink, 2009).

Clearly, more research in this area is required and could indicate that educational practices might be working counter to some learners' innate motivation and energy. If this were the case, prolonged involvement in a learning setting antithetical to one's TP could increase learner stress and anxiety. This suggests a possible analogy between research on TP and occupation fit (Puccio et al., 2018), as well as more recent research into TP and mental health (Puccio et al., 2018).

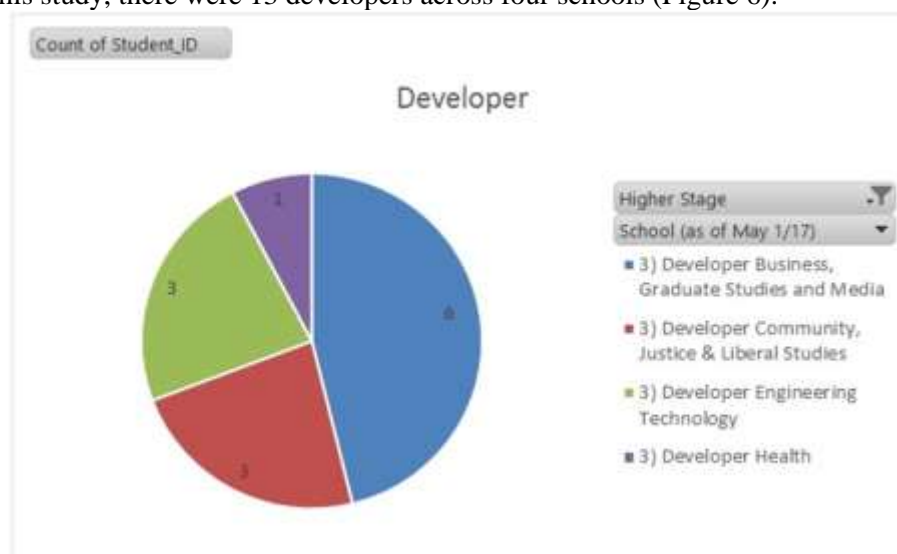In this study, there were 13 developers across four schools (Figure 6).

Figure 6: Number of developers across schools.

They showed no discomfort working alone, with a partner, in a group, or on an individual presentation and showed no discomfort presenting first, or last. This apparent confidence in sharing work may relate to the profile's focus on accuracy and reliability. Their meticulousness is indicated by the variety of strategies they use when studying such as colour coding, reading their notes, using practice quizzes, studying with others, asking the instructor for help and searching the internet – a go-to option for all profiles. Essay writing and having to do a task in five minutes created the greatest discomfort and may reinforce developers' perfectionist tendencies through systemic analysis. While developers may generate precise work regarding format and style with few, if any, careless errors, their thoroughness may increase their anxiety if time were a factor in the task.

In this study, developers, clarifiers and integrators displayed similar results regarding important academic elements. Students with three of these preferences showed career specific content, individual achievement, field placement and co-op to be important to their learning. Unlike clarifiers and integrators, developers also valued autonomy in assignments and due dates possibly because they are adept at creating lists and timelines (Thurber, 2014).

Implementers related closely to the findings of ideators in this study. Since they are action-oriented, they did not see student-instructor interaction as very important to the learning process. Relationships take time; maybe they would rather realize their ideas than talk about them. Similarly, implementers felt less discomfort over pop quizzes than exams, and matched the discomfort level over writing essays expressed by clarifiers.

According to the research, developers are rare in corporate profiles while ideators are abundant (Thurber, 2014; Puccio, Miller & Acar, 2018). This study indicates the opposite and poses an interesting challenge regarding the impact education's highly coded, hierarchal and role-

entrenched environment has on learner identity and behaviour. The low number of ideators and high number of developers may signify that the institution of education has a conforming influence on learners and that the over-emphasis on high-stakes, standardized evaluations shapes some learners' thinking patterns in a way that runs counter to their natural preferences. Education's role-defined, unnatural environment might coerce some learners into displacing their natural preferences for a provisional preference that is more appropriate to the context and expectations of being a learner. While people can't always act within their preferences, prolonged deferral of their energizing thinking tendencies, as experienced over the timeframe of obtaining a degree, may contribute to increased mental health issues among learners. Again, more research is required in this area.

The unexpected

The slippery and subjective nature of language was foregrounded in this study. When self-assessing their leadership traits using TP terminology, participants gave affirmative responses (over 50%) to all attributes except the word "controlling". Only 28.6% thought they were controlling and 38% thought they needed to develop this attribute. In questions where participants had to assess the value of controlling to current and future skills, they gave this attribute the lowest score of all descriptors. Similarly, the term "independent" received the highest score for skills participants currently had (96%) and the second highest, next to controlling, as an attribute they do not need developing. Yet, independence was part of the ideator cluster. This suggests the "cool factor" – as defined in marketing geared toward youth consumers – may have influenced responses with culturally-specific connotations playing a role in accurate self-assessment.

The ever-changing nature of language may require a re-examination of the FourSight measure of creative thinking preferences and its privileging of the word over other literacies, such as the visual and spatial, especially when assessing diverse generations, ethnicities and non-linguistic audiences. By ignoring language's malleability, the FourSight measure privileges linguistic intelligence and may miss opportunities for inclusivity of non-linguistic, yet valid, measures, such as a kinaesthetic or visual demonstration of preferences.

Reflective enquiry toward empathy

The project showed TP as a valuable framework for reflection leading to autonomous learning and skill development. The following excerpt is a reflection written by a healthcare student before learning thinking preferences:

One challenge our group faced was initially getting started. We had a very slow start, which was in part due to *members not taking time* to meet to discuss the overall project. Another issue we faced was one individual not being present for group meetings, which we felt was *unfair* that *this person did not participate equally* with the *rest of us*. In the future, it would be best to set-up group expectations early on in project collaboration so that all group members are aware of *their responsibilities* and what the *repercussions are if they fail to do so* [*my italics*] (2013).

The italicised discourse reflects a fracture between group members and suggests future punitive action. In contrast, the next excerpt illustrates a reflection written through the lens of TP:

Thinking preferences really foretold the way *our group* functioned. . . *our group* was made up of two developers, which really brought out structure, organization and planning. . . The two ideators were the ones who took on the creative ideas. . . For my next collaborative assignment, *I will try to learn* a little more from the way *my other group members* prefer to think by *expanding my ideas from a different angle [my italics]* (2017).

The emotional and interpretative maturity shown here highlights the value of TP's precise, asset-focused language describing behaviour: "Learning about the types of people you are working

with. . . can be a great asset in strengthening the team and ensuring that you are not *butting* heads. By knowing your team, you can maximize on everyone's strengths to create an equilibrium" (2016). Another student example typifies the autonomous learning that thinking preferences encouraged in students:

- Knowing the type of problem solver, I am will allow me to identify what role I can partake in the group. This information has also allowed me to identify the areas I need to work on so I can improve on my interactions with other types of problem solvers in the future (2016).

- Employing a thinking preference framework in the classroom encourages a social-emotional intelligence that appreciates, rather than fears, heterogeneity, and in our ever diverse and globalized world, this is a 21st Century skill worth acquiring (Boyko-Head, 2018).

Conclusion

This project investigated the impact learner awareness of cognitive bias and strengths can play in the development of intra-personal skills leading toward autonomous and responsible learning behaviour. In addition, the project highlighted the value that awareness had in the development of inter-personal skills enhancing a sense of community through empathetic communication and equitable collaboration. The project used the FourSight Creative Thinking Preferences assessment tool as an evidence-based means of identifying, personalizing and applying TP language and theory within the classroom. Results indicated that thinking preferences became a flexible, reflective framework for all learners, regardless of their program of study. By utilizing a common language and interpretation of experience, participants demonstrated an empathetic perspective regarding those experiences and accepted differences, difficulties, and failures as steps, rather than obstacles, toward learning autonomy and personal and professional development.

The project's workshops demonstrated that an awareness of TP helped learners collaborate with others because they communicated better through a shared, value-neutral language depicting process tasks. Thus, the pilot study demonstrated that Thinking Preference awareness in education helps develop creative, democratic and empathetic learning spaces (Boyko-Head, 2018). Along with its enhanced communication, collaboration and conflict-avoidance, TP also accommodates a maximizing of the diverse as manifested in the very nature of the 21st Century post-secondary classroom. According to M.J. Allen, "learning is viewed as a cognitive and social process in which students construct meaning through reflection and through their interaction with faculty, fellow students and others" (2003, p3). The workshops highlighted the diverse ways that learning takes place within learners, helping them to develop empathetic, empowering learning experiences.

Central to this project's transformative emancipatory approach was learners' reflective ability in seeing educational interactions through a TP lens. This makes the post-secondary classroom an innovative playground for perspective-shifting and role-playing where all become curriculum co-creators and leaders. The pilot also showed how Yorks and Kasl's (2012) "paradox of diversity" can be overcome through TP's value-neutral framework. Likewise, the study revealed TP's empowering potential. By increasing learners' cognitive awareness, TP provided development strategies to improve leadership competencies, and to build the capacity identified by the World Economic Forum (2016) and Organization of Economic Cooperation and Development (2011). The impact of TP on learners' progress toward personal and professional mastery, autonomous learning strategies and empathetic perspectives is encouraging for future research and classroom application.

References

Adamson, C. (2012). Learning in a VUCA world. Online Education Berlin News Portal, Nov 13. Allen, M.J. (2003). *Assessing academic programs in higher education.* Wiley.

Boyko-Head, C. (2018). "Designing empowered students: Creativity tools in the post-secondary classroom". *Paris Symposium Presentation*, International Centre of Innovation in Education

Burns, (2016). Using math menus: Giving students a menu of activities to choose from helps differentiate instruction and engage all learners. *Educational Leadership, 74*(2), p40-44.

C21 Canada. (2012). *Shifting minds: A 21st century vision of public education for Canada.* Retrieved from: http://www.c21canada.org/wp-content/uploads/2012/11/Shifting-MindsRevised.pdf

Canadian Alliance of Student Associations, (2018). Breaking down barriers: Mental health and Canadian post-secondary students. CASA.

Drapeau, P. (2014). *Sparking student creativity: Practical ways to promote innovative thinking and problem solving.* Association of Supervision and Curriculum Development

Dweck, C. (2016). *Mindset: The new psychology of success.* Ballantine Books.

Eng, N. (2017). *Teaching College: The ultimate guide to lecturing, presenting, and engaging students.* Norman Eng, Ed.D.

FourSight LLC. (2014). *FourSight thinking profile: Interpretative guide.* (2014). FourSight LLC.

Freeman, T., Anderman, L., & Jensen, J. (2007). Sense of belonging in college freshman at the classroom and campus levels *The Journal of Experimental Education, 75*(3), 203-220

Gregory, G. & Kaufeldt, M. (2015). *The motivated brain: Improving student attention, engagement and perseverance.* ASCD.

Gurak-Ozdemir, S., Acar, S., Puccio, G., & Wright, C. (2019): Why Do teachers connect better with some students than others? Exploring the influence of teachers' creative-thinking preferences, *Gifted and Talented International*, doi:10.1080/15332276.2019.1684221

Hammond, Z. (2015). *Culturally responsive teaching and the brain: Promoting authentic engagement and rigor among culturally and linguistically diverse students.* Corwin.

IBM Global Business Services (2012). Connected generation: Perspectives from tomorrow's leaders in a digital world. IBM Institute for Business Value.

IBM (2010). *Capitalizing on complexity: Insights from the global chief executive officer (CEO) study.* IBM United Kingdom Limited.

Fenesi, B., Sana, F., Kim, J. Shore, D. (2014). Reconceptualizing working memory in Educational Research. *Educational Psychology Review*. DOI:10.1007/s10648-014-9286-y

Mourshed, M., Chijioke, C., & Barber, M. (2010). *How the world's most improved school systems keep getting better.* McKinsey & Company. Retrieved from: http://www.mckinsey.com/client_service/social_sector/latest_thinking/worlds_most_improved_\schoos

National Institute of Mental Health. (2017). Public speaking anxiety and fear of brain freezes. Retrieved: https://nationalsocialanxietycenter.com/2017/02/20/public-speaking-and-fear-of-brain-freezes/

Neuman, W.L. (2009). *Social research methods: Qualitative and quantitative approaches. (4th edition.).* Allyn and Bacon.

Organization of Economic Cooperation and Development (2011). *Lessons from PISA for the United States: Strong performers and successful reformers in education.* OECD Publishing. Retrieved from: http://dx.doi.org/10.1787/9789264096660-en

Organization of Economic and Cooperative Development (2014). Student engagement at school a sense of belonging and participation results from PISA 2000. OECD,

Pink, D. (2009). *Drive: The surprising truth about what motivates us.* Riverhead Books.

Puccio, G, & Icar, S. (2015). Creativity will stop you from being promoted, right? Wrong! A comparison of creative thinking preferences across organizational levels. *Business creativity and the creative economy, 1*(1), 4-12.

Puccio, G. J., Miller, B., & Acar, S. (2018). Differences in creative problem-solving preferences across occupations. *The Journal of Creative Behavior*. Advance online publication. doi: 10.1002/jocb.241

Puccio, G.J., Szalay, P., Acar, S., Boyer, A. (2019). Understanding the intersection between well-being and creative process: An exploratory study of creative-thinking preferences and aspects of mental health. *International Journal of Creativity and Problem Solving*., *29*(2). 5-15.

Reville, P. (2016). The journey toward equity and excellence: Massachusetts. *Excellence through equity: Five principles of courageous leadership to guide achievement for every student*. In A. Blankenstein & P. Noguera (eds). Assocation of Supervision and Curriculum Development.

Thurber, S. (2014, February). *Thinking Preferences Chart*. Unpublished internal document.

Tucker, C. (2013). Five musts for mastery: The wise use of technology engages students in rigorous and meaningful learning. *Educational Leadership*, *71*(4), 57-60.

Ukpokodu, O. (2009) The practice of Transformative Pedagogy. *Journal on Excellence in College Teaching, 20*(2) 43-67.

World Economic Forum, (2016). *Future of jobs report: Employment skills and work force strategy for the Fourth Industrial Revolution.* Geneva: World Economic Forum.

World Economic Forum, (2016b). *New vision for education: Fostering social and emotional learning through technology.* Geneva: World Economic Forum.

Yorks, L. & Kasl E. (2002). Toward a theory and practice for whole-person learning: Reconceptualising experience and the role of affect. *Adult Education Quarterly,* Vol. 52 No. 3, 176-192.

Yuhas, D. (2014). So you want to be a genius. *Scientific American Mind,* Winter, No. 19.

About the Author

Dr. Christine Boyko-Head, is an artist-educator specializing in innovative curriculum development, arts-based integration, creativity and personal development through the arts. She earned her Ph.D. in English Literature from McMaster University. She is a certified Foursight Thinking Preference and Design Thinking facilitator and a Values Institute intercultural competency auditor. She founded a theatre company creating social justice plays for young audiences, helped start a national magazine for/by young people, converted her Ph.D. dissertation into a historical fiction and fund raised $!.3m for her community. Her interests swirl around minimizing the familiar in order to maximize the diverse. She has published, taught and presented nationally and internationally with a focus on developing equitable, empathetic collaborative experiences. Her new venture, Kaleidoscope Learning Solutions, amplifies creativity as a way to help educators think differently, learn flexibly and live creativity. She teaches at Mohawk College and lives on the shores of Lake Erie in Southern Ontario, Canada.

Address

Dr. Christine Boyko-Head;
McKeil School of Business, Communications, Creative Industries and Liberal Studies;
Mohawk College of Applied Arts and Technology;
135 Fennell Ave W.;
Hamilton, ON Canada L9C 0E5.

e-Mail: Christine.boyko-head@mohawkcollege.ca

Website: www.kaleidoscope-ls.com