การศึกษาสมรรถนะการอยู่ในสังคมโลก-การวิเคราะห์ระบบผู้นำทางการศึกษา ในเมืองอัลเบอร์ตา ประเทศแคนาดา
Global Competence Matters-An Analysis of System Education Leaders in Alberta, Canada

Roger Nippard[1]* ปรัชนันท์ เจริญอาภรณ์วัฒนา[1] และ ระพิน ชูชื่น[2]
Roger Nippard[1]* Paratchanun Charoenarpornwattana[1] and Rapin Chuchuen[2]
[1]คณะศึกษาศาสตร์ มหาวิทยาลัยบูรพา
[2]โรงเรียนสาธิตพิบูลบำเพ็ญ มหาวิทยาลัยบูรพา
[1]Faculty of Education, Burapha University
[2]Piboonbumpen Demonstration School, Burapha University
*Corresponding Author, E-mail: roger.nippard@gmail.com

Article Info
- Received: March 1, 2022
- Revised: July 4, 2022
- Accepted: July 5, 2022
- Available Online: August 30, 2022

บทคัดย่อ

งานวิจัยนี้มีวัตถุประสงค์เพื่อทดสอบความสัมพันธ์ระหว่างระดับสมรรถนะการอยู่ในสังคมโลกของระบบผู้นำทางการศึกษาในเมืองอัลเบอร์ตา ประเทศแคนาดาจำนวน 42 คน และการนำหลักสูตรสมรรถนะการอยู่ในสังคมโลกของนักเรียนมาใช้ งานวิจัยนี้เป็นส่วนหนึ่งของการใช้กระบวนทัศน์การวิจัยแบบปฏิบัตินิยม โดยใช้การออกแบบการวิจัยแบบผสมผสาน ผู้วิจัยได้นำเสนอรายงานในส่วนของการวิจัยเชิงปริมาณและใช้แบบประเมินสมรรถนะการอยู่ในสังคมโลกมาเป็นแบบประเมินเปรียบเทียบค่าคะแนนของผู้นำทางการศึกษาจำนวน 13 คนจาก 2 ระบบที่ใช้หลักสูตรสมรรถนะการอยู่ในสังคมโลกของนักเรียน โดยเปรียบเทียบกับค่าคะแนนของผู้นำทางการศึกษาจำนวน 29 คนที่ถูกกำหนดเป็นกลุ่มควบคุม การวิเคราะห์ข้อมูลโดยใช้ตัวแปรอิสระทางด้านประชากรศาสตร์จำนวน 8 ตัวแปร โดยใช้การวิเคราะห์สถิติแบบ Welch t-test ผลการวิจัยพบว่า ไม่มีความแตกต่างอย่างมีนัยยะสำคัญทางสถิติ อย่างไรก็ตามพบว่าผู้ให้ข้อมูลส่วนใหญ่เป็นเพศชาย สัญชาติแคนาดา เชื้อชาติยุโรป พูดได้หลายภาษา ระดับการศึกษาปริญญาเอก มีประสบการณ์น้อยกว่า 2-3 ปี มีการเดินทางข้ามประเทศและมีปฏิสัมพันธ์ในระดับนานาชาติอยู่บ่อยครั้ง นอกจากนี้ผลการวิจัยยังพบว่า ระดับคะแนนในภาพรวมของระบบผู้นำทางการศึกษาจาก 2 ระบบโรงเรียนที่ใช้หลักสูตรสมรรถนะการอยู่ในสังคมโลกไม่มีความแตกต่างอย่างมีนัยยะสำคัญทางสถิติ แต่พบว่าระดับคะแนนภาพรวมของระบบผู้นำทางการศึกษามีค่าสูงกว่ากลุ่มควบคุมในด้านระดับความพร้อมภายนอก ขณะที่ผลการวิจัยสนับสนุนให้มีการนำปัจจัยภายนอกเช่นความรู้ทางด้านวัฒนธรรม ทักษะด้านมนุษยสัมพันธ์ และทัศนคติ มาใช้ในการสร้างประสบการณ์สำคัญสำหรับการพัฒนาสมรรถนะการอยู่ในสังคมโลก

คำสำคัญ: แบบประเมินสมรรถนะการอยู่ในสังคมโลก, ระดับการศึกษาระดับ K-12, ระบบผู้นำทางการศึกษา, สมรรถนะการอยู่ในสังคมโลก

Abstract

In this study, the overall research objective was to examine the relationship between the global competence aptitude levels of Alberta system education leaders (N = 42) and their implementation of student global competence programming. Employing a pragmatic paradigm, and mixed- methods research design this paper reports on the quantitative study portion. Using the standardized Global Competence Aptitude Assessment, the scores of educational leaders (N = 13) from two systems with student global competence program implementation as a strategic priority were compared to the scores of educational leaders (N = 29) who served as a control group. An independent statistician completed the data analysis, based on eight demographic variables, using Welch's t-test. The overall results showed no statistically significant differences. However, there was a positive association for participants who were male, possessed Canadian citizenship, were of European ethnic heritage, spoke multiple languages, held doctoral degrees, had fewer years of work experience, travelled more extensively internationally, and interacted more frequently interculturally. The most compelling finding was that whereas the overall GC levels of the system education leaders from the two school systems with GC programming as a strategic priority were not statistically significantly different from one another, the overall GC levels of the system education leaders from these two school systems were both higher than those of the control group. These differences were statistically significant and were most evident on the external readiness scale. The study findings support that external factors such as broad cultural knowledge and interpersonal skills and attitudes acquired through increased intercultural experiences play a critical role in GC development.

Keywords: Global Competence, Global Competence Aptitude Assessment, K-12 Education, System Education Leader

Introduction

Historically, Canadian K-12 school classrooms were strikingly culturally homogeneous, with students and staff being primarily of European heritage from Britain and France. Growth in global migration has contributed to increased cultural diversity, with Canada's population growing by 1.8 million, or at a rate of 5.2%, between 2016 and 2021, with 80% of the growth attributable to immigration (Statistics Canada, 2021). In the 2018 administration of the Programme for International Student Assessment (PISA), Canada had the highest proportion of immigrant students (35%) amongst all participating countries, with the province of Alberta (36%) slightly higher (Council of Ministers of Education Canada [CMEC], 2021).

Globalization is a second powerful force contributing to more culturally diverse classrooms. Friedman (2005) spoke of globalization using the metaphor of a "flat world." Goods, services, money, and information now routinely flow freely across national borders with human activities no longer constrained by geopolitical boundaries, a process described as "the death of distance" (Zhao, 2010). With more people able to participate in economic, cultural, and political activities on a global scale, "there is no place on the map that is not affected in some way by events in another location and the ebb and flow of decision-making influences outcomes... for all societies that share this planet" (Greunke, 2010).

Classrooms are also more connected digitally as technology facilitates almost instantaneous interpersonal and intercultural interactions worldwide. In January 2022, the monthly users of Facebook totaled over 2.91 billion, with 340 million in India leading the way, and there were over 2.562 billion YouTube and 1.0 billion TikTok users (Statista, 2022). Political discourse, deliberations, and intercultural encounters are increasingly taking place through virtual meetings, digital social networks, forums, blogs, e-petitions, and email.

As communities and classrooms become microcosms of a more globalized society, the ability to communicate, collaborate, and resolve complex problems with people from diverse cultural backgrounds has become increasingly important (Organisation for Economic Cooperation and Development [OECD], 2018). As more cultural minorities have enrolled in schools and responding to global challenges (e.g., climate change, pandemics, natural disasters, poverty) has increased in importance the American National Education Association (2010) referred to global competence as a "21st century imperative." The Association called for all K-12 schools to better prepare students to understand and address global issues, and for educators to reexamine their teaching strategies and curriculum so all students could thrive in a global and interdependent society. In 2010, CMEC identified student GC as a national priority (CMEC, 2018) and tasked those in positions of educational leadership with implementing programming that fosters student GC development.

In the Canadian province of Alberta, school system leadership is a unique role with a different focus and responsibility complementary to the teaching profession. In 2020-21there were 76 public, separate, francophone and charter school systems each led by a superintendent and senior leadership team. Each is required to become a member of the College of Alberta

School Superintendents (CASS), and in August 2021 CASS, in legislation, was recognized as a professional regulatory organization and the title "system education leader" (SEL) was exclusively set aside for its members. The CASS Act (2021) states, "No person, or group of persons, shall use the words system education leader alone, or in combination with other words, unless that person is a member of the college."

Research Objective

The objective of this study was to examine the relationships between the GC aptitude, professional leadership quality standard, and administrative practices of Alberta SELs as they related to the implementation of student GC programming. The specific research questions explored whether there were any significant GC differences in the SEL population (a) based on eight demographic variables and (b) between SELs from two school systems with student GC as a strategic priority, Small Metro School System (SMSS; a pseudonym) and Pathways School System (PSS; a pseudonym), and an Alberta Control Group (ACG).

The two specific research questions were as follows:

1. Does the aptitude level of Alberta K-12 SELs, as measured by the Global Competence Aptitude Assessment (GCAA), differ statistically based on the demographic variables of gender, citizenship, ethnic heritage, language(s) spoken, level of formal education, years of teaching experience, international travel duration, or daily intercultural interaction?

2. Is there a statistically significant difference between the overall GC levels, as measured by the GCAA, of SELs in SMSS and PSS; PSS and ACG; and SMSS and ACG?

Literature Review

Emerging constructs such as GC that have a significant collective effect require common ideas and language to determine relationships and impacts and to garner attention from policymakers and academic leaders. In one of the earliest attempts to arrive at a definition, Lambert (1996) defined a globally competent person as "one who has knowledge of current events, empathizes with and has a positive attitude towards others that are culturally different and a level of foreign language competence and task performance." Wilson and Daltron (1997) noted that GC required core knowledge of language, world issues, history, and cultural traditions, as well as the perceptual knowledge that an open, creative mind affords. Olsen and Kroeger (2001) similarly noted that GC prerequisites involved comprehending substantive knowledge-based concepts (e.g., global dynamics, transnational change, human choices) in conjunction with emotionally based concepts, including perceptual understanding and intercultural communication skills. Initial GC research focused on the postsecondary sector. The American Council on Intercultural and International Education (1996, November 15-17) defined a globally competent learner as: "One who is able to understand the interconnectedness of peoples and systems, to have a general knowledge of the world and world events, to accept and cope with the existence of different cultural values and attitudes, and to celebrate the richness and benefits of this diversity".

Strategies and initiatives recommended for colleges and universities included garnering the support of the education leadership team and governors, the incorporation of global education into mission statements, revision of accreditation standards, development of research-based global education programs and provision of financial resources to support global training opportunities American Council on Intercultural and International Education (1996, November 15-17).

Swiss Consulting Group (2002, p. 4) defined GC as "the capacity of an individual, or team, to parachute into any country and get the job done while respecting cultural pathways." Their report defined a required skill set for both individual and organizational GC with recommended institutional strategies that included an "intercultural faculty, effective two-way (faculty and leadership) communication, diverse leadership, systemic best practice, and a truly global strategy design process" (Swiss Consulting Group, 2002). Stearns (2008) suggested additional strategic elements that included branch campuses around the world, a centralized government agency to oversee global education programming, creation of new specialty globally focused courses, more inclusive participation in programs, and expanding the number of countries sending international students into college programs.

Hunter (2004) convened a Delphi panel composed of human resource managers of transnational corporations and international postsecondary educators in the first attempt to reach a broad stakeholder consensus definition. Ultimately the definition arrived at was "having an open mind while actively seeking to understand cultural norms and expectations of others, and leveraging this gained knowledge to interact, communicate, and work effectively outside one's environment" (Hunter, 2004). In 2009, Hunter developed the GCAA as a standardized instrument to measure GC. The updated instrument definition is "having flexible, respectful attitudes, including self-perspective, and applying knowledge of the historical, geographic, and societal factors that influence cultures in order to effectively interact and build relationships with people around the world" (Global Competence Associates, n.d.-a).

Hunter, White, and Godbey (2006), Shams and George (2006), Reimers (2010), and Naffziger, Montagno, and Montag-Smit (2015) have identified the importance of an interdisciplinary approach and a range of culturally relevant knowledge, skills, attitudes, and values (KSAVs). In their view, globally competent individuals need to be open-minded and possess a positive attitude toward cultural differences and an internal framework of global values to engage these differences. Skills such as being able to think, understand, and speak in a foreign language; having strong communications skills; being technologically proficient; and being able to collaborate and think critically have emerged as GC subsets. De Sousa Santos (2007) identified the importance of recognizing knowledge from outside the western world in creating a better world and solving problems that threaten well-being and life on this planet. Similarly, Mignolo (2011) argued that this diversity of knowledge, in the form of a global knowledge repository, supported by those who are able to think with critical global-mindedness, will produce individuals capable of the responses required for both human and planetary well-being. More recently,

taking action to problem-solve in order to address global challenges has gained prominence in GC definitions (Asia Society & OECD, 2018; CMEC, 2018; Mansilla & Jackson, 2011).

Educators across the world are reframing their understanding of economics, communication, security, cultural identity, citizenship, and the environment as part of a global movement to position GC at the centre of K-12 education (Asia Society & OECD, 2018; Ontario Ministry of Education, 2017; Finnish National Board of Education, 2015; Alberta Education, 2011; Mansilla & Jackson, 2011; Singapore Ministry of Education, 2010; Ananiadou & Claro, 2009). CMEC (2016) adopted the Pan-Canadian Systems Level Framework on Global Competencies that endorsed six global competencies for all students: critical thinking and problem-solving; innovation, creativity, and entrepreneurship; learning to learn/self-awareness; collaboration; communication, and global citizenship; and sustainability. PISA, in 2018, also incorporated GC into its tri-annual testing cycle of 15-year-olds, and one of its directors noted, "If we don't get global competence right, we are building our education systems on sand" (Schleicher, as cited in AFS Global Competence, 2018). PISA also developed the Global Competence Assessment Framework to assist national school systems in using different types of assessment to reflect on the effectiveness of their GC initiatives and teaching practices (OECD, 2017).

The GCAA Model

As shown in Figure 1, the GCAA model consists of eight dimensions: four that comprise Internal Readiness (IR) and four that comprise External Readiness (ER). IR is at the model core and relates to the "personal characteristics (self-awareness and attitudes) necessary to become globally competent" (Global Competence Associates, n.d.-b). IR includes the four dimensions of self-awareness, risk-taking, open-mindedness, and attentiveness to diversity. The ER dimensions (historical perspective, global awareness, intercultural capability, and collaboration across cultures) are on the outer two rims and relate to the "cultural knowledge and interpersonal skills acquired through education or life experiences" (Global Competence Associates, n.d.-b).

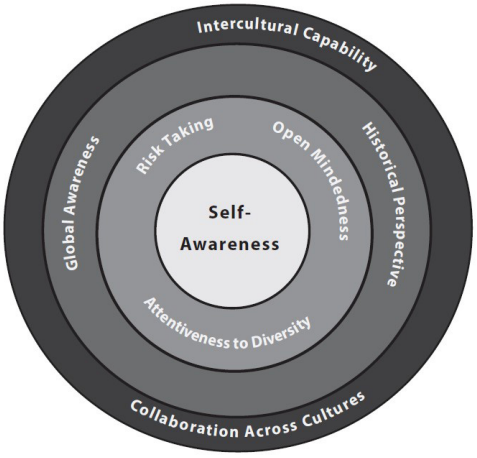

Figure 1 Global Competence Aptitude Assessment Model
Note. Adapted from Global Competence Model, by Global Competence Associates, n.d.-b.

Research Hypotheses

On the first research question, we hypothesized that there would be no statistically significant differences across any of the eight instrument demographic variables. For the second research question, we hypothesized that there would be no statistically significant differences in the overall SEL GC scale scores, or on the eight instrument dimension scale scores comprising IR (personal), or ER (environmental), as shown in Figure 1.

Research Methodology

This study employed a pragmatic paradigm (Creswell, 2009), mixed-methods research design where the complementary quantitative and qualitative methodologies can yield findings that neither can find alone (Polit & Beck, 2012) and it is "familiar to most researchers and can result in well validated and substantiated findings" (Creswell, 2009). Fidel (2008) noted that a mixed-methods design is beneficial for exploring complex, multifaceted phenomena and particularly suited for the behavioural sciences and evolving social realities. A concurrent parallel research strategy was used, and this article presents the findings from the quantitative portion of the study derived from the GC aptitude data collected.

Population And Sample

The overall population studied was Alberta SELs, and as of August 2021, there were 387 CASS members (Cortes, August 25, 2021). The sample population was selected using different sampling methods. First, we used purposive sampling to identify SELs from school systems with GC as an explicit strategic priority. SMSS and PSS met this specific criterion, and both had engaged in formal GC research using the student version of the GCAA to gather baseline data to inform GC programming (Dressler & Shultz, 2021). All 13 SELs in SMSS and PSS agreed to participate. Next, we used a random sampling method to select 29 SELs who formed the control group from the remainder of the SEL population (Table 1).

Table 1 Study Population and Sample Overview

SELs	Population	Sample number	Sample (%)
ACG	374	29	8
PSS	6	6	100
SMSS	7	7	100
Total	387	42	11

Quantitative Data Collection Instrument and Analysis

The data were collected using the GCAA. This 109-question standardized instrument has been tested in a wide range of research studies in 115 countries, on six continents, to over 15,500 business professionals, students, and educators (Global Competence Associates, n.d.-a). The principal investigator personally contacted each SEL to discuss participation. Those who

provided verbal confirmation received an information package that included an information sheet that described the study, the consent statement for the participants, and the agreement for participation in research as required by the Burapha University Research Ethics Board. Forty-four SELs returned a signed agreement and received a secure, personalized numerical passcode to access the online instrument, with 42, or 95%, completing the assessment. To ensure anonymity and confidentiality, individual identifiers were removed, and the researcher received an encrypted email and passcode to access the statistical group reports. An independent statistician completed the analysis using Welch's t-test to determine if any of the GC aptitude differences in the population sample were statistically significant (p-value < .05) based on gender, citizenship, ethnicity, language(s) spoken, level of formal education, years of work experience, international travel duration, or time spent daily interacting interculturally. A similar analysis was conducted to determine if there were any statistically significant differences between SELs in SMSS and PSS when compared to the ACG on the eight dimensions of the GCAA model associated with the IR and ER scales (see Figure 1).

Research Findings

Research Question 1: GCAA Demographic Variable Findings

Our hypothesis that there would be no statistically significant differences on any of the instrument demographic variables was supported. Table 2 shows the variable descriptive statistics.

Table 2 GCAA Descriptive Statistics by Demographic Variables

Variable		n	$\bar{X}$	S.D.	SEM*
Gender	M	26	77.70	7.39	1.45
	F	16	73.80	8.79	2.20
Citizenship	Canadian only	38	76.84	6.95	1.13
	Dual	4	70.32	5.30	2.65
Ethnic heritage	Euro-Caucasian	37	77.03	6.85	1.13
	Other	5	70.24	5.82	2.60
Languages	Unilingual	27	75.20	7.39	1.42
	Multilingual	15	78.04	8.31	2.15
Formal education	Master's	37	75.75	7.34	1.21
	Doctorate	5	79.67	2.12	0.95
Work experience	< 30 years	15	78.15	6.87	1.77
	> 30 years	27	75.15	8.76	1.69
International travel	< 3 months	19	75.70	9.18	1.54
	> 3 months	23	76.65	7.37	2.11
Daily intercultural interaction	< 1 hour	26	75.70	8.19	1.61
	> 1 hour	16	77.50	8.12	2.03

*SEM = Standard Error of the Mean

Using Welch's t-test, there were no statistically significant differences based on five of the demographic variables, and three could not be reported (see Table 3).

Table 3 t-test Results for Demographic Variables

Variable	t	df	p	$\overline{X}$	SEM
Gender	1.77	31	.09	3.9	2.52
Citizenship	—	—	—	—	—
Ethnic heritage	—	—	—	—	—
Language(s) spoken	1.27	30	.21	2.84	2.49
Formal education	—	—	—	—	—
Work experience	-1.44	36	.16	3.00	2.62
International travel duration	.43	35	.67	1.05	2.55
Daily cultural interaction	.90	29	.37	1.80	2.59

Note. For the demographic variables of citizenship, ethnic heritage, and level of formal education, the variable internal distribution of scores resulted in small sample sizes, and no statement was possible on whether any statistically significant differences existed.

Variable 1: Gender

Twenty-six SELs identified as male and 16 as female. Males had a slightly higher overall mean score with a lower standard deviation ($\overline{X}$ = 77.70, S.D. = 7.39) than females ($\overline{X}$ = 73.80, S.D. = 8.79; see Table 2). There was no statistically significant difference in GCAA scores based on gender: T(1.77, 2.0). The p-value is .087, and this value is greater than .05 (see Table 3).

Variable 2: Citizenship

Thirty-eight SELs identified Canada as their only country of citizenship, and four held both Canadian and secondary citizenship-two from Lebanon and two from the United States. Those with sole Canadian citizenship had a higher overall mean score with a higher standard deviation ($\overline{X}$ = 76.84, S.D. = 6.95) than those with dual citizenship ($\overline{X}$ = 70.32, S.D. = 5.30; see Table 2). As all participants possessed Canadian citizenship, no statement regarding statistical differences was possible.

Variable 3: Ethnic Heritage

Thirty-seven SELs identified as Caucasian/White European, three as Arab, and two as First Nations/Indigenous. Those of Euro-Caucasian ethnic heritage had a higher overall mean score with a higher standard deviation ($\overline{X}$ = 77.03, S.D. = 6.85) than those with other ethnicities. ($\overline{X}$ = 70.24, S.D. = 5.82; see Table 2). Given the small sample sizes for those not of Euro-Caucasian ethnic heritage, no statement on whether any statistical differences existed was possible.

Variable 4: Language(s) Spoken

Twenty-seven SELs spoke one language capably and 15 spoke two or more capably. Unilingual SELs had a lower overall mean score with a larger standard deviation ($\overline{X}$ = 75.34, S.D. = 8.31) than multilingual SELs ($\overline{X}$ = 78.33, S.D. = 7.72; see Table 2). There was no statistically significant difference in GCAA scores based on language(s) spoken: T(1.27, 2.0); p-value .21 (see Table 3).

Variable 5: Level of Formal Education

Thirty-seven SELs had a master's degree and five had master's and doctoral degrees. Those with a doctoral level had a higher overall mean score with a lower standard deviation ($\overline{X}$ = 79.67, S.D. = 2.12) than those with a master's level ($\overline{X}$ = 75.75, S.D. = 7.34; see Table 2). Given the small sample size for those with doctoral degrees, no statement was possible on whether any statistical difference existed.

Variable 6: Years of Work Experience

Fifteen SELs had under 30 years of experience, and 27 had more than 30. Those with under 30 years of experience had a higher mean score with a lower standard deviation ($\overline{X}$ = 78.15, S.D. = 6.87) than those with over 30 years of experience ($\overline{X}$ = 75.15, S.D. = 8.76; see Table 2). There was no statistically significant difference in GCAA scores based on the years of work experience: T(-1.44, 2.0); p-value .16 (see Table 3).

Variable 7: International Travel Duration

Twenty-three SELs had taken international trips of longer than 3 months and 19 had taken trips of less than 3 months. Those with more time spent travelling internationally had a higher mean score with a smaller standard deviation ($\overline{X}$ = 76.65, S.D. = 7.37) than those who had spent less time abroad ($\overline{X}$ = 75.70, S.D. = 9.18; see Table 2). There was no statistically significant difference in GCAA scores based on the levels of international travel duration: T(0.43, 2.0); p-value .67 (see Table 3).

Variable 8: Daily Intercultural Interaction

Sixteen SELs interacted interculturally for over 1 hour daily and 26 interacted interculturally for under 1 hour daily. Those spending more time had a higher mean score with a lower standard deviation ($\overline{X}$ = 77.50, S.D. = 8.12) than those spending less time ($\overline{X}$ = 75.70, S.D. = 8.19; see Table 2). There was no statistically significant difference in GCAA scores based on the levels of daily intercultural interaction: T(0.90, 2.0); p-value .37 (see Table 3).

In summary, while the hypothesis of no significant differences based on demographic variables was supported, there was a positive association between the GC of SELs who were male (+3.9), held a sole Canadian citizenship (+6.5), were of European ethnicity (+6.8), spoke more than one language capably (+2.8), had a doctoral level of formal education (+3.9), had less than 30 years of work experience (+3.0), took trips abroad longer than 3 months in duration (+.95), and interacted interculturally for more than 1 hour per day (+1.8).

Research Question 2: School System Comparisons

Our hypothesis that there would not be any statistically significant differences between the two school system leadership teams with GC programming as a strategic priority and the control group was not supported. Whereas the overall GC scores of the SELs from SMSS and PSS were not statistically significantly different from one another, when compared to the ACG control group, both sets of scores were higher, and the differences were statistically significant. The differences were most evident on the ER scale.

GCAA Scores: SMSS and PSS

SMSS SELs had a slightly lower GCAA overall mean score with a slightly higher standard deviation ($\overline{X}$ = 80.61; S.D. = 6.06) as compared to PSS SELs ($\overline{X}$ = 80.99; S.D. = 5.69); a slightly lower mean score with a higher standard deviation on the IR scale ($\overline{X}$ = 79.80; S.D. = 6.61) as compared to PSS SELs ($\overline{X}$ = 81.55, S.D. = 4.62); and on the ER scale a slightly higher mean score and lower standard deviation ($\overline{X}$ = 81.59; S.D. = 5.50) as compared to PSS SELs ($\overline{X}$ = 80.40; S.D. = 6.76). The three largest dimension differences were all on the ER scale (see Table 4).

Table 4 GCAA Descriptive Statistics for SMSS and PSS

Variable	SMSS		PSS		SEM
	$\overline{X}$	S.D.	$\overline{X}$	S.D.	
Internal readiness	79.80	6.61	81.55	4.62	-1.75
Self-awareness	84.11	2.52	82.05	2.91	2.06
Risk-taking	78.93	8.09	81.17	5.28	-2.24
Open-mindedness	79.64	9.57	81.42	8.21	-1.77
Attentiveness to diversity	77.40	9.97	81.67	5.98	-4.27
External readiness	81.59	5.50	80.40	6.76	1.19
Historical perspective	73.34	18.86	73.70	17.24	-0.36
Global awareness	79.54	21.02	88.25	6.97	-8.71
Intercultural capability	84.29	14.91	77.83	13.91	6.45
Collaboration across cultures	87.66	5.24	81.83	11.50	5.82

There was no statistically significant difference in the SMSS and PSS SELs' overall scores: GCAA scores, T(-.15, 2.2), p-value .883; IR scores, T(-0.56, 2.2), p-value .587; and ER scores T(0.34, 2.2), p-value .739. All p-values are > .05 (see Table 5).

Table 5 t-test Results for SMSS and PSS

Variable	Overall score		Internal readiness		External readiness	
	SMSS	PSS	SMSS	PSS	SMSS	PSS
$\bar{X}$	80.61	80.99	79.8	81.55	81.59	80.40
Variance	25.15	15.38	43.65	21.39	30.27	45.73
Observations	7	6	7	6	7	6
df	11		11		10	
p-value	.883		.587		.739	

GCAA Descriptive Statistics: PSS and ACG

PSS SELs had a higher overall GCAA mean score with a lower standard deviation ($\bar{X}$ = 80.99; S.D. = 5.69) than ACG SELs (74.17; S.D. = 8.31); a higher mean score with a lower standard deviation on the IR scale ($\bar{X}$ = 81.55; S.D. = 4.62) as compared to ACG SELs ($\bar{X}$ = 77.13; S.D. = 6.27); and on the ER scale a higher mean score with a lower standard deviation ($\bar{X}$ = 80.40; S.D. = 6.76) as compared to ACG SELs ($\bar{X}$ = 71.72; S.D. = 10.35; see Table 6).

Table 6 GCAA Scores PSS and ACG

Variable	PSS		ACG		SEM
	$\bar{X}$	S.D.	$\bar{X}$	S.D.	
Internal readiness	81.55	4.62	77.13	6.27	4.42
Self-awareness	82.05	2.91	79.25	6.40	2.80
Risk-taking	81.17	5.28	74.78	9.01	6.39
Open-mindedness	81.42	8.21	77.60	9.51	3.81
Attentiveness to diversity	81.67	5.98	77.13	9.94	4.53
External readiness	80.40	6.76	71.72	10.35	8.68
Historical perspective	73.70	17.24	63.30	24.25	10.40
Global awareness	88.25	6.97	68.84	17.96	19.41
Intercultural capability	77.83	13.91	68.84	11.94	8.99
Collaboration across cultures	81.83	11.50	83.61	10.75	-1.78

There was a statistically significant difference between the PSS and ACG SELs' overall GC aptitude scores (T[-3.29, 2.2], p-value .006) and ER scores (T[-2.58, 2.2], p-value .026), but not their IR scores (T[-1.99. 2.2], p-value .078). The largest differences were on the global awareness and historical perspective dimensions (see Table 7).

Table 7 t-test Results PSS and ACG

Variable	Overall score		Internal readiness		External readiness	
	ACG	PSS	ACG	PSS	ACG	PSS
$\bar{X}$	74.17	80.99	77.13	81.55	71.72	80.40
Variance	50.17	15.38	39.35	21.39	56.26	45.73
Observations	29	6	29	6	29	6
df	13		9		18	
p-value	015		359		.003	

GCAA Descriptive Statistics: SMSS and ACG

SMSS SELs had a higher overall GCAA mean score and lower standard deviation ($\bar{X}$ = 80.61; S.D. = 6.06) as compared to ACG SELs ($\bar{X}$ = 74.17; S.D. = 8.31); a higher mean score, with a lower standard deviation, on the IR scale ($\bar{X}$ = 79.80, S.D. = 6.61) as compared to ACG SELs ($\bar{X}$ = 77.13; S.D. = 6.27); and on the ER scale a higher mean score with a lower standard deviation ($\bar{X}$ = 81.59; S.D. = 5.50) as compared to ACG SELs ($\bar{X}$ = 71.72; S.D. = 10.35; see Table 8).

Table 8 GCAA Scores: SMSS and ACG

Variable	SMSS		ACG		SEM
	$\bar{X}$	S.D.	$\bar{X}$	S.D.	
Internal readiness	79.80	6.61	77.13	6.27	2.67
Self-awareness	84.11	2.52	79.25	6.40	4.87
Risk-taking	78.93	8.09	74.78	9.01	4.15
Open-mindedness	79.64	9.57	77.60	9.51	2.04
Attentiveness to diversity	77.40	9.97	77.13	9.94	0.27
External readiness	81.59	5.50	71.72	10.35	9.86
Historical perspective	73.34	18.86	63.30	24.25	10.05
Global awareness	79.54	21.02	68.84	17.96	10.70
Intercultural capability	84.29	14.91	68.84	11.94	15.44
Collaboration across cultures	87.66	5.24	83.61	10.75	4.05

There was a statistically significant difference between the SMSS and ACG SELs' overall GC aptitude scores (T[-2.79, 2.2], p-value .015) and ER scores (T[-3.48, 2.1], p-value .003), but not their IR scores (T[-0.96, 2.3], p-value .359). The largest differences were on the intercultural capability, global awareness, and historical perspective dimensions (see Table 9).

Table 9 t-test Results SMSS and ACG

Variable	Overall score		Internal readiness		External readiness	
	ACG	PSS	ACG	PSS	ACG	PSS
$\bar{x}$	74.17	80.61	77.13	79.8	71.72	81.59
Variance	50.17	25.15	39.35	43.65	56.26	30.27
Observations	29	7	29	7	29	7
df	13		9		18	
p-value	.015		.359		.003	

Discussion

GCAA Scores and Demographic Variables

There was a positive association (+3.9) between gender (male), and differences were most evident on the ER scale, particularly the global awareness (+14.45) and historical perspective (+13.36) dimensions. Global awareness on the GCAA refers to "visible aspects including knowledge of major cultures around the world" (Global Competence Associates, n.d.-b), and historical perspective refers to "hidden aspects that inform values and beliefs" (Global Competence Associates, n.d.-b). On the IR scale, the largest gender difference was on the self-awareness dimension, where females had a higher (+1.73) score. The GCAA defines self-awareness as "the ability to know yourself and how you fit into your own culture, including personal preference gaps compared with norms and mores" (Global Competence Associates, n.d.-b).

The gender distribution of scores suggests that these differences can be attributed primarily to life and work experiences and not the personal characteristics and attitudes of the participants. Stankovska, Dimitrovski, Memedi, and Ibraimi (2019) also found that females scored higher on self-awareness but generally had higher levels of GC. In comparing the PISA test results, Schleicher (2020) notes that girls had a higher awareness of global issues, more positive attitudes towards immigrants, a greater ability to understand different cultural perspectives, and greater agency regarding global issues. The Canadian PISA assessment results also showed that 85% of Canadian girls, achieved at or above the baseline GC level as compared to 76% for boys (CMEC, 2021). Dressler and Schultz (2021) also found no statistically significant gender differences in either student, teacher, or administrator GCAA scores.

All SELs were Alberta practitioners holding Canadian citizenship. The position also requires a minimum of a "master's degree from a university in Alberta or a university of an equivalent standard" (Government of Alberta, 2018). Consequently, there was no ability to comment on statistical differences on these variables due to the small sample sizes. The small sample size for non-Caucasian/White European ethnic heritage highlights a constraint. Despite years of increasing cultural diversity in the larger population, there is still a gap in mirroring the representation of ethnic heritages within Alberta educational leadership positions. Swiss

Consulting Group (2002) found that diversity within a leadership team and an intercultural faculty are essential factors in the development of GC. The National Education Association (2010) identified an appreciation for the opportunity to learn and work with people from diverse backgrounds as an important component of GC programming. Trimble and Chin (2019) found that growing diversity within organizations required culturally diverse leadership styles and a deep understanding of how effective leadership is exercised.

There was a negative association between being unilingual and GC. Speaking one language was the greatest negative predictor of IR (-3.69), and with a negative ER difference (-2.28) had the most significant combined negative impact across both scales. For multilingual SELs, the most significant IR and ER differences were on the attentiveness to the diversity dimension (+8.5) and intercultural capability dimension (+ 4.82), respectively. Meng, Zhu, and Cao (2017) found that additional language proficiency was a significant predictor of GC, contributed to greater attentiveness to diversity, and fostered a better understanding of the beliefs, customs, and behaviours in cultures using that language. Schleicher (2020) noted that "the association between speaking two or more languages and student GC attitudes was positive in almost all countries on the PISA assessment". Chang (2002) similarly found that those speaking more than one language had higher GCAA scores; that the difference was not statistically significant; and additional languages spoken was also a significant predictor of the IR attentiveness to diversity dimension score.

There was a positive association between GC and less work experience. In practice, SELs generally have held several administrative leadership positions at all school levels and tend to have significant work experience. The effect of length of work experience was most evident on the ER historical perspective (+7.03) and global awareness (+6.73) dimensions. This finding suggests that those with less work experience had more familiarity with events that have shaped values, beliefs, and behaviours and a greater breadth of understanding about geography, languages, religions, and other cultures. This finding also suggests that work experience factors, such as the nature, context, and variety of work experiences, play a more significant role than the length of experience in GC development. Chang (2002) found that employees with 10 or more years of experience had a higher, but not a statistically significant difference, in GCAA scores, with the difference also most evident on the ER scale.

There was a positive association between GC and international travel duration on both the IR (+1.41) and ER (+.47) scales, with the effect most evident on the IR risk-taking (+4.06) and open-mindedness (+3.87) dimensions. The GCAA defines risk-taking as "maintaining a willingness to extend beyond your cultural framework by trying new experiences" (Global Competence Associates, n.d.-b). Those travelling abroad for trips of a longer duration appear to be more willing to try unfamiliar things, more tolerant of risk, and more willing to make and learn from mistakes. The GCAA conceptual model defines open-mindedness as "having a curiosity to learn about things holistically before arriving at a conclusion" (Global Competence Associates, n.d.-b). When processing new information, those spending more time abroad may be more willing to

reconsider already informed attitudes and opinions. Schenker (2019) used the GCAA as a pre-and post-test to examine the effect of an 8-week intensive German summer study abroad program on college student GC and found that IR scores were higher with more significant gains across all four dimensions. The difference in open-mindedness was also significant. Greunke (2010) found that the overall mean scores for postsecondary students who participated in a study abroad program, as compared to those who had only the university experience, were significantly higher across both the IR and ER scales.

There was a positive association between GC development and increased daily intercultural interaction across the IR (+3.03) and ER (+1.46) scales. The effect was most evident on the IR attentiveness to diversity dimension (+6.81) and the ER intercultural capability dimension (+3.81). This finding suggests that time spent in authentic engagement with others from different cultures provides greater insight, understanding, and sensitivity towards others who are different and increases the ability to interact effectively. This finding also suggests that providing opportunities to promote cultural diversity in classrooms and seamless integration of opportunities for daily intercultural interaction is an essential factor in GC development. This finding is consistent with Chang (2002), who found that daily intercultural interaction was a significant predictor of the IR attentiveness to diversity dimension score.

GCAA Scores and School System Leadership Groups

SMSS and PSS

There was no statistically significant difference between the overall, IR, or ER composite scores of the SELs in SMSS and PSS. PSS leaders scored slightly higher overall (80.99 vs 80.61) and higher on the IR scale (81.55 vs 79.80), whereas SMSS leaders scored higher on the ER scale (81.59 vs 80.40). The three most significant score variances were all on the ER scale. PSS SELs scored higher (+8.71) on the global awareness dimension. However, SMSS SELs scored higher (+6.45) on the intercultural capability and collaboration across cultures (+5.82) dimensions. Collaboration across cultures on the GCAA refers to the "ability to work effectively in diverse teams" (Global Competence Associates, n.d.-b).

The driver for cultural diversity in SMSS was immigration. In the pre–COVID-19 2019–2020 school year, SMSS had 867 students coded as English Language Learners (ELLs), no coded First Nations Metis Inuit (FNMI) students, and no international students registered (Tampa [a pseudonym], 2021, 18 June), which provided a cultural structural diversity index of .25. With cultural diversity driven entirely by resident students from recent immigrant families, SMSS had a GC "at home" strategy.

In comparison, PSS had a blended "at home and abroad" GC strategy. In the pre–COVID-19 2019–2020 school year, PSS had 884 ELLs, 357 FNMI students, and 166 international students (Cosmo, June 15, 2021). This composition provided a structural diversity index of .17. The Indigenous and more recent immigrant populations combined with the sixth-largest international student program in Alberta provided a broad spectrum of cultural diversity within classrooms that historically had been relatively homogenous.

The dimension variances suggest that cultural diversity can have a differential effect on GC aptitude and program implementation. In SMSS, working with a large resident recent immigrant student population and their families (many of whom have lived only in Canada) had the most significant positive impact on the intercultural capability dimension, followed by the collaboration across cultures dimension. In PSS, working across a broader spectrum of cultural diversity with Indigenous, ELL, and foreign international students from over 30 different countries contributed to higher scores on the global awareness dimension. Meng, Zhu, & Cao (2017) found that Chinese international students' contact with their host students significantly enhanced their global skills, enabling them to succeed in intercultural contexts and improved their global attitudes and willingness to embrace cultural diversity.

SMSS and ACG; PSS and ACG

SELs from SMSS and PSS had significantly higher GC aptitude scores than SELs in the ACG. The pattern was the same as both the overall and ER scores were statistically significantly higher, whereas the IR scale differences were not statistically significant. This finding suggests that the SEL group differences were primarily related to their educational and life experiences instead of personal characteristics (self-perspective and attitudes). The highest combined mean SMSS and PSS score (84.97) and ACG highest score (83.61) and slightest difference (1.36) were on the collaboration across cultures ER dimension. The three most significant differences were all on the other ER dimensions, and all were statistically significant. When comparing PSS and ACG SELs (see Table 6), PSS had higher scores on global awareness (+19.41), historical perspective (+10.40), and intercultural capability (+8.99). When comparing SMSS and ACG SELs (see Table 8), SMSS had higher scores on intercultural capability (+15.44), global awareness (+10.70), and historical perspective (+10.05). This finding suggests that, in general, Alberta SELs had a high aptitude for building diverse teams, were respectful of cultural contexts and worked collaboratively and effectively with team members from varying cultural backgrounds and perspectives.

Recommendations for Further Study

This study is potentially the first in examining the quantitative relationship between system K-12 educational leadership and GC program implementation. The findings suggest that system leadership administrative practices matter, and establishing a strategic direction that specifically articulates and conceptualizes the school system's vision and mission as preparing students to be globally competent is beneficial in the implementation of GC programming. Although there are constraints associated with using a standardized instrument such as cost and reliance on third parties, the increased reliability and validity in the generalization of results suggest that further studies using the GCAA, particularly at the K-12 level, would be of value. The nature of the association between the independent variables provided areas of consideration in implementing GC programming, and additional K-12 studies using the instrument would be helpful.

Although this study sample represented 11% of the overall Alberta SEL population, and 100% of SELs in the two school systems with GC as a strategic priority, the small sample sizes restricted the quantitative analysis to basic descriptive statistics. Additional studies where the GCAA quantitative data could be further analyzed using more advanced descriptive statistics, including MANOVA and hierarchical multiple regression models, would be helpful to confirm, contrast, or expand upon the findings.

The original research methodology had an Alberta accredited school in Asia as part of the sample population. However, challenges related to staffing and programming during the COVID-19 pandemic resulted in their withdrawal from participation. Consequently, the final sample population was exclusively from Alberta, and further GC research should include those in positions of system educational leadership in other countries to mitigate Western biases. The GCAA instrument itself is North American, and care must be taken in extrapolating the results across cultural contexts.

There is a need for further research on specific additional administrative practices of SELs that contribute to GC programming. Our study findings suggest that having a strategic direction that specifically articulates the school system's mission and vision to prepare students to be globally competent is one administrative practice contributing to more globally competent students, schools, and school systems. Further studies to examine administrative practice variables and the relationships between them would be helpful for comparative and GC program implementation purposes.

Finally, test instruments that measure the full spectrum of the theoretical framework elements of global competencies (especially attitudes, values, and behaviours/actions) are not readily available. There is a need for future studies to assist in the identification of metrics for teacher K-12 formative and summative assessments that measure the full spectrum of GC KSAVs. Identifying similar metrics for developing and implementing GC strategic plans would also be beneficial.

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