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Impact of Demographic Backgrounds by Humanities and Social Sciences Students on Their Psychological of Emotional Intelligence Skill: Structural Equation Multiple Cause and Multiple Indicator (SEM-MIMIC) Model

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Abstract

Background and Aims: Although the educational framework aims to develop employability skills, there is concern among establishments regarding educational policies and accredited bodies. However, it is not widely known that students in humanities and social sciences perceive general emotional intelligence skills. Part of the motivation to learn such skills stems from Work-Integrated Learning (WIL) programs and students' backgrounds. The development of these skills in higher education institutions often occurs through specific initiatives only, without a well-structured curriculum design framework. The conflict over the differences and interpretation of general skills across disciplines makes designing a framework more challenging. This study aims to 1) perform exploratory factor analysis and confirmatory factor analysis of emotional intelligence skills for students in Work-Integrated Learning (WIL) programs within the humanities and social sciences, and 2) To examine a structural equation of multiple causes and multiple indicator (SEM-MIMIC) model of emotional intelligence skills for students in WIL programs within the same fields using techniques that test the congruence between variables and confirm the relationship between individual variables and their respective components.

Methodology: This cross-sectional research and stratified random sampling and online questionnaire were conducted among 780 third and fourth-year humanities and social sciences WIL program students from eight universities in Thailand. The online survey consisted mainly of items that asked students to rate their level of self-efficacy in 28 general emotional intelligence skills. Exploratory and Confirmatory Factor analyses and SEM-MIMIC models were performed to examine the psychometric properties of the instrument to its evidence of reliability and validity.

Results: Structural validity checks of the tool through exploratory and confirmatory factor analysis revealed that humanities and social sciences students returning from WIL programs of more than 16 weeks or one academic semester of the workplace have components of emotional intelligence skills, namely 1) emotional awareness, 2) emotional management, and 3) effective relationship management. Analysis using the Structural Equation Multiple Cause and Multiple Indicator (SEM-MIMIC) model showed that demographic variables such as gender, year level, cumulative grade point average, and major affect the development of emotional intelligence skills in humanities and social sciences students. The model's consistency with empirical data is demonstrated by the following values: (x^2 = 832.892, df = 353, p = 0.000, x^2/ df = 2.360, CFI = 0.945, TLI = 0.924, RMSEA = 0.058, SRMR = 0.040).

Conclusion: The analysis by the SEM-MIMIC model allows researchers to precisely understand how demographic backgrounds can impact emotional intelligence skills and that the measurement of these skills in humanities and social sciences students who have completed more than 16 weeks or one academic semester of workplace experience is beneficial for promoting WIL programs in these faculties. These programs can foster engagement with establishments, and career development advisors, and assist students in developing emotional intelligence skills for future livelihood and career advancement.

Keywords: Exploratory Factor Analysis; Confirmatory Factor Analysis; Sem-mimic Model; Emotional Intelligence Skills; Humanities and Social Sciences

Introduction

Contemporary education is increasingly perceived as a substantial investment by both parents and students. Tomlinson (2016), observed this trend in regions like Australia and the Americas, where parents and students actively seek educational programs that are relevant to an evolving global context. Darling (2015), emphasized the importance of career creation and accessibility for students during their studies. Dean et al (2020), noted the significant impact of this on the structural management systems of Thai higher education institutions, which are compelled to compete and push for educational strategies that enhance soft skills and employment readiness, as highlighted by (Tudor, 2018). The varying tuition fees Baran (2019), and the establishment of networks between educational institutions and businesses Goulart (2022), are pivotal goals for students pursuing undergraduate degrees and entering the job

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market, as asserted (Venkatraman, 2018). Despite the decreasing number of students due to demographic shifts and reduced government funding for universities higher education institutions might increasingly shift their focus toward career-oriented curricula (García, 2021).

Work-integrated learning (WIL) programs have opened opportunities for higher education institutions to offer value and optimal choices to parents and students, ensuring satisfactory returns on their educational investments (Harris, 2017). Previous educational programs in Thai higher education did not emphasize or collaborate in career creation for students Razali (2017), a gap that WIL curricula have successfully bridged, guiding students into professions during their studies (McGunagle, 2020). The success of WIL programs in continents like Australia, Europe, and America is noted by (Matherly, C., & Tillman, M. (2019). Concurrently, the Thai government has exerted pressure on higher education institutions to focus more on academics, research, innovation, and promoting career-oriented curricula Nguyen et al (2023), aiming to attract students to WIL programs that facilitate professional identity development Jackson (2019), knowledge of workplace structures and soft skills, and suitability for employment (Silva, 2018). WIL students are crucial for the labor market in the public sector, businesses, industry, and non-profit organizations (Schermelleh, 2003).

Collaboration and network-building between higher education institutions and business entities enhance the efficacy of Work-Integrated Learning (WIL) programs in developing employable skills and increasing their desirability in the job market, as Clarke (2018), points out. This has led to a proliferation of WIL courses within Thai higher education, offering a diverse range of options, (Jewpanya, 2023). Bora (2015), notes that each of these courses has distinct strengths and weaknesses within the context of undergraduate curricula. Crucially, students can identify or determine job positions that align with their professional fields Hénard et al (2012), as they acquire knowledge and skills in the classroom before applying them in real workplace settings during their studies (Crebert, 2004). Furthermore, Millis (2023), emphasizes that WIL programs focus on enhancing employment opportunities for students, regardless of their academic performance.

The content and mechanisms within WIL programs should ideally integrate employability skills with soft skills in a balanced manner, as suggested (England, 2020). This approach involves using problem-based learning to improve diagnostic skills and the ability to manage challenges effectively, as discussed (Zhang, 2012). Students gain from experiential learning, enhancing their reasoning and broadening their worldviews, given that WIL programs are recognized for imparting process knowledge and maintaining a high level of practical stability, even if not explicitly recorded in the curriculum (Aliyu, 2017).

In the contemporary academic landscape, the diversity and breadth of curricula in the humanities and social sciences significantly influence the educational management system. These curricula impact the overall economic system of countries, encompassing various fields like foreign language studies, social development, social studies, and local governance (retrieved January 15, 2022, from https://www.mhesi.go.th). Fink (2013), advocates for a high level of integration between higher education institutions and various agencies to jointly promote and enhance knowledge, soft skills, and professional skills. This integration also involves other components that are valuable for future employment prospects (Buabeng, 2012). The incorporation or emphasis on Work-Integrated Learning (WIL) in these disciplines presents increased challenges for students, entrepreneurs, researchers, and academics (Eberhard, 2017).

The study of emotional intelligence skills has garnered considerable attention from researchers, as a majority have discovered that the enhancement and practical application of such skills are beneficial for creative contributions and success in professional careers and lifestyles (Pradhan, 2016). Researchers aim to test these skills and have extensively reviewed literature in this area. They have employed questionnaires, like those developed by Ciarrochi (2002), which are widely recognized for their reliability and structural validity in the fields of education, business, and industry. Goleman (2001), These tools measure and predict the development of emotional intelligence skills in students enrolled in WIL programs in humanities and social sciences. Multivariate statistical analysis techniques such as Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), and Structural Equation Multiple Cause and Multiple Indicator (SEM-MIMIC) model were utilized to understand the structural

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validity of tools measuring the emotional intelligence skills of students in Work-Integrated Learning (WIL) programs within the faculties of Humanities and Social Sciences. The sample groups, possessing components of emotional intelligence, were directly influenced by their demographic backgrounds. Lyonette (2017), The subsequent sections will detail the analysis of this data, demonstrating how the emotional intelligence skills of students in these WIL programs can predict knowledge, capabilities, and impact on personality and professional advancement and drive organizational growth (Jordan & Troth, 2024).

Research Objectives

1) To perform exploratory factor analysis and confirmatory factor analysis of emotional intelligence skills for students in Work-Integrated Learning (WIL) programs within the humanities and social sciences

2) To examine a structural equation of multiple causes and multiple indicators (SEM-MIMIC) models of emotional intelligence skills for students in WIL programs within the same fields

Literature Review

Emotional intelligence and career development for employee success. These skills have become increasingly important in the past and are now critical to job performance and employee growth opportunities (Caruso, 2013). We would help push and promote human resources in the organization to develop their working abilities along with sustainable emotional intelligence skills (Cooper, 1997).

In the organization or institution there are a variety of workers with each other carrying out activities communication has the potential to offer emotional intelligence which creates friendship and good solutions between each other. This issue has led academics to attempt to provide a perspective on emotional intelligence. It is the science of psychology or the science of sociology because one aspect of emotional intelligence is called social intelligence. It was first described by Thorndike in the 1920s, who was the first person to coin the term. (Dumbrava, 2011). The inventor of the intelligence experiment, developed in the 1950s, has had a profound effect. The extensive at the personal level family level, community level, and societal level (Cherniss, 1998).

The perspective between emotion and reason is widely debated because of the reasons that come to support the frontier of using emotional intelligence and support the reason for living and other images that will appear unique to the person (Abraham, 1999). In the 1980s, there was a trend seriously about the concept of multiple intelligences playing a role in living, studying, and working (Zeidner, 2004). How multiple intelligences appear in Ergonomics, Communication, Linguistics, Mathematical logic of Self-Interpersonal relationships, and the group of phenomena that occur naturally from intelligence (Boyatzis, 2004).

The evolution of intelligence quotient to emotional intelligence until the creation of the term and definition among researchers and academics. There is an opinion that intelligence quotient to emotional intelligence (Elfenbein, 2002). Experimental use of emotional intelligence in various situations, three models can be created regarding the development of such things, namely the perception model capability model, and personality model. All three models are integrated into the development of emotional intelligence contributing to the wide-ranging debate towards the development of emotional intelligence (Schutte, 1998).

Emotional intelligence's clear potential in the workplace continues to impact Mayer (2008), on real-world situations in convenience stores. It was found that employers give questions to regular employees to test their emotional intelligence so that employees can cope with the stress of sales volume and must perform their duties efficiently within time constraints. The emerging test results of emotional intelligence in employees have a clear potential to contribute to their success at work. (O Neil, 1996). Meanwhile, The model examines emotional intelligence as a theory of performance to apply the results to predict the expression of good and reasonable emotions according to the situation. Situational emotional intelligence is defined as the ability to learn based on situations and the expression of emotional intelligence that makes one stand out in the workplace (Boyatzis, 2000). At the same time, the display of emotional intelligence is also stimulated by rewards and punishments (Zeidner, 2003).

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Emotional intelligence involves awareness of one's role and duties but only when and how one expresses emotions and how to control them (Petrides, 2016). Emotional intelligence is a guide to knowledge that has been cultivated through family and society to make people happy while working and living in a private atmosphere and participating in activities with other people (Grewal, 2006).

Work-integrated learning (WIL), as defined by Tanaka (2012), is a student's learning for credit designed to occur in the workplace, and Makhadi (2021), describes WIL as "insight gained through being mindful of oneself by creating or observing one's interactions which are constructed from experience and past knowledge." These definitions share a commonality in that WIL involves interaction between students and external environmental factors, according to Aprile (2020), and reflection upon the system of interactions with various environments through experiences outside the educational institution (Rampersad, 2014). However, Cooper (2010), and the National Committee for Work-Integrated Learning propose a more comprehensive definition of WIL as a structured educational strategy that integrates classroom learning with effective work experience in a related field, aimed at the academic and career development of the learner. This outcome from cooperative education enables learners to progress filled with experiences from integrating theory and practice. WIL is described as a partnership among students, educational institutions, and employers, defining individual responsibilities and other duties that contribute positively to the organization's image (Patrick, 2008).

Given that the foundation of WIL is learning through work, the definition of work becomes crucial, influencing the shaping or redesigning of curricula to be applicable in this context, considered education for a profession, like accounting (Jackson, 2019). Abeysekera (2006), posits that managing a curriculum well comes from achieving success in other beneficial skills that students and related parties should possess. WIL is widely used to incorporate work experience into educational programs in professional fields such as law, medicine, and nursing, which may be applied upon graduation (Jameson, 2016). However, previous literature mentions only minimal evidence of widespread WIL experiences in academic accounting courses in Australia, (Taylor, 2004). WIL projects concern building relationships between three disciplines: education, economics, and the practice of educational processes and related companies and training. These ever-changing economic variables, knowledge, and companies underscore that the successful design of WIL programs requires continuity (Baartman, 2011).

Research Conceptual Framework

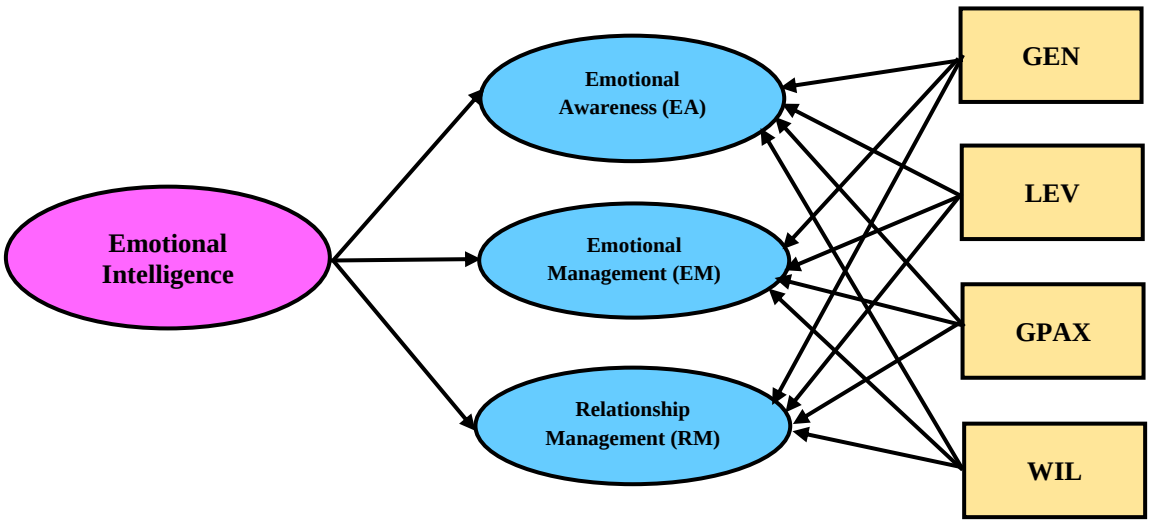

Figure 1 Research Conceptual Framework

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Methodology

This section describes the research steps, including tool development, participant involvement, and data analysis. This cross-sectional research utilized probability sampling and stratified sampling methods with students in the humanities and social sciences. The data collection involved online assessments of emotional intelligence skills, measuring, and predicting psychological development. The random nature of data collection from students before and after their participation in the WIL programs was ensured by obtaining permission from university administrators where students engaged in real-world work experiences for more than 16 weeks or at least one academic semester and chose more than one type of WIL activity. The online questionnaire was used to measure and predict psychological development related to three components of emotional intelligence: 1) emotional awareness, 2) emotional management, and 3) effective relationship management. The researchers applied exploratory factor analysis (EFA) confirmatory factor analysis (CFA) and Structural Equation Multiple Cause and Multiple Indicator (SEM-MIMIC) models to examine the structure of these components. To ensure an adequate sample size for CFA, the study followed the guidelines of having at least 200 participants per parameter as suggested by (Kyriazos, 2018). Each observed variable's factor loading should be greater than 0.50 as per (Dyer et al, 2005).

The model's fit with empirical data in CFA analysis and the Structural Equation Multiple Cause and Multiple Indicator (SEM-MIMIC) model was determined using Chi-square statistics. The overall indices needed to align with the average values of CFI, and GFI error estimation should exceed 0.900 to be acceptable. The model was evaluated using SRMR values less than 0.050 and RMSEA values less than 0.050, as noted by (Chan, 2000).

Instrument Development

An intensive literature review was conducted to identify effective tools for measuring and predicting the development of emotional intelligence (EI) skills. Goleman's (1996), instrument, widely accepted in academia, industry, and business sectors, consists of 28 positively phrased items, using a 5 – 5-point Likert scale ranging from (1 – Never) to (5 – Always).

The instrument underwent content validity checks, with the Index of Item – Objective Congruence (IOC) determined by three experts. A trial with 3 5 students assessed the initial understanding of EI skill-related questions. Analysis from these students revealed a good level of comprehension for each item on the online questionnaire. Cronbach's alpha for the overall instrument was $\alpha = 0.817$, with a mean $\bar{\chi} = 4.216$ (indicating a good level of agreement). The alpha values for emotional awareness were $\alpha = 0.755$ and $\bar{\chi} = 4.109$, for emotional management $\alpha = 0.792$ and $\bar{\chi} = 4.279$, and fore relationship management $\alpha = 0.783$ and $\bar{\chi} = 4.247$, all exceeding the standard threshold of 0.700 as per (Bonett, 2015).

Participants

The population consisted of 780 students across 15 higher education institutions. The researcher used probability sampling by stratified sampling based on the defined population scope (Etikan, 2016). The sample size included students in state and private universities (6 and 2 respectively, totaling 8 institutions) enrolled in year 3 or 4 of WIL programs in the humanities and social sciences. The sample of 384 students met the preliminary selection criteria and had engaged in work placements exceeding 1 6 weeks or one academic semester in more than one type of WIL activity. The research adhered to human research ethics protocols, with volunteers providing informed consent before participating. Data collection using the online questionnaire took approximately 25 minutes per participant, conducted between October 2022 and January 2023.

Analysis

Descriptive statistics such as frequency, percentage, mean, and standard deviation (SD) were used, along with inferential statistics, including t-test, EFA, CFA factor analysis, and SEM-MIMIC model. This was to measure and predict the development of emotional intelligence skills components in WIL students within the humanities and social sciences, using a statistical analysis program tailored for social science research.

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Results

The study, "Impact of demographic backgrounds by humanities and social sciences students on their psychological of emotional intelligence skill: Structural Equation Multiple Cause and Multiple Indicator (SEM-MIMIC) models" aimed to 1) perform exploratory factor analysis and confirmatory factor analysis of emotional intelligence skills for students in Work-Integrated Learning (WIL) programs within the humanities and social sciences and 2) To examine a structural equation multiple causes and multiple indicator (SEM-MIMIC) model of emotional intelligence skills for students in WIL programs within the same fields. The sample consisted of 384 students, and the analysis was divided into two parts: Part 1 focusing on the personal status of the respondents, and Part 2 on the pre-and post-work analysis, exploratory and confirmatory factor analysis, and SEM-MIMIC model.

Part 1: Personal Status of Respondents The analysis of the personal status of respondents from 8 universities in central and eastern regions, both public and private, covered gender, year of study, GPAX, and WIL programs. The frequency and percentage were calculated as detailed in Table 1.

Table 1. Personal Status of Respondents. n = 384

Status	Abbreviation of Variables Dummy Variables	6 Government Universities (279 people)		2 Private Universities (105 people)	
		Number	Percentage	Number	Percentage
Gender	GEN				
Male	0 = Male	185	66.30	78	74.30
Female	1 = Female	94	33.70	27	25.70
Year of Study	LEV				
3	0 = 3	75	26.90	36	34.30
4	1 = 4	204	73.10	69	65.70
GPAX	GPAX				
2.50 – 3.00	0 = 3.00 under	55	19.80	43	41.00
3.01 – 3.50	1 = 3.01 and	175	62.80	32	30.50
3.51 and above	above	49	17.40	30	28.50
WIL Programs	WIL				
Local Government	0 = Humanities	89	31.90	-	-
Administration	1 = Social				
Social Development	Sciences	62	22.30	25	23.80
English for Communication		45	16.20	43	41.00
Chinese Language		39	14.00	11	10.50
Thai Language		25	9.00	16	15.30
Law		19	6.60	10	9.40

From Table 1, it is observed that the majority of students in the Work-Integrated Learning programs (WIL) are male, with a total of 263 students accounting for 68.50% of the sample. Female students in these programs number 121, representing 31.50%. Most of the WIL students are in their fourth year of study, totaling 273 students or 71.10%, while 111 students in their third year make up 28.90% of the sample. The Grade Point Average (GPA) distribution shows that 207 students, or 53.90%, have a GPAX between 3.01- 3.50. The next largest group, comprising 98 students or 25.60%, has a GPAX between 2.50 – 3.00. Those with a GPA of 3.51 or higher number 79, account for 20.50% of the sample. In terms of specific WIL programs, 89 students (23.20%) are studying in the field of Local Governance Administration. This is closely followed by 88 students (23.00%) enrolled in the English Language for Communication program and 87 students (22.70%) in Social Development. These figures indicate the distribution of students across different WIL programs within the humanities and social sciences.

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The analysis introduced latent variables into the model, with full names and abbreviations as follows: 1) Gender (GEN), 2) Year of Study (LEV), 3) Most Recent Semester Cumulative Grade Point Average (GPAX), and 4) Work-Integrated Learning Programs (WIL). The researcher employed the enter method as the technique for selecting all four types of demographic variables and incorporating them into the analysis of the latent variable model. The researcher had to decide which predictive variables had a relationship with the latent variables that should be included in the latent variable model. These latent variables are influenced by several observable external variables and, in turn, influence several internal observable variables, acting as predictors reflecting a broader range of emotional intelligence skills. For statistical test values, if there is statistical significance, it is assumed that the predictive variable should be included in the latent variable model.

Part 2: Analysis of Comparative Results Before and After Work Implementation, Exploratory Factor Analysis, Confirmatory Factor Analysis, and structural equation multiple cause and multiple indicator (SEM-MIMIC) model.

2.1 Analysis of comparative results of the mean ($\bar{x}$) and standard deviation (SD) of emotional intelligence skills in WIL programs students before and after work implementation in organizations, using the t-test. Details are shown in Table 2.

Table 2. Mean, standard deviation, and t-test results before and after work implementation.

Type	**n**	**$\bar{\chi}$**	**SD**	**t**	**d**	**Sig**
Before Work	384	2.318	.387	65.505*	383	.000
After Work	384	4.246	.400			

Notes: n = 384; * = significant at 5 per cent level; ** = significant at 1 per cent level; *** = significant at 0.1 per cent level

From Table 2, it was found that WIL students showed a significant increase in emotional intelligence skills post-work placement ($\bar{x}$ = 4.246, SD = .400) compared to pre-work placement ($\bar{x}$ = 2.318, SD = .387), at a 0.050 significance level.

Table 3. Exploratory factor analysis of emotional intelligence skills: Three factors based on responses to 28 Items.

Factors/Abbreviation	**Factor Loadings**		
Items	Emotional Awareness (EA)	Emotional Management (EM)	Relationship Management (RM)
Emotional Awareness (EA)			
EA_1	.738	0.000	0.000
EA_2	.693	0.000	0.000
EA_3	.792	0.000	0.000
EA_4	.774	0.000	0.000
EA_5	.766	0.000	0.000
EA_6	.713	0.000	0.000
EA_7	.837	0.000	0.000
EA_8	.630	0.000	0.000
EA_9	.608	0.000	0.000
EA_10	.504	0.000	0.000
EA_11	.658	0.000	0.000
Factors/Abbreviation		Factors/Abbreviation	
Items	Emotional Awareness (EA)	Emotional Management (EM)	Relationship Management (RM)

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Factors/Abbreviation	Factor Loadings		
Emotional Management			0.000
(EM)	0.000	.621	0.000
EM_1	0.000	.694	0.000
EM_2	0.000	.698	0.000
EM_3	0.000	.677	0.000
EM_4	0.000	.734	0.000
EM_5	0.000	.788	0.000
EM_6	0.000	.747	0.000
EM_7	0.000	.662	0.000
EM_8			
Relationship			
Management (RM)	0.000	0.000	.766
RM_1	0.000	0.000	.816
RM_2	0.000	0.000	.825
RM_3	0.000	0.000	.717
RM_4	0.000	0.000	.817
RM_5	0.000	0.000	.841
RM_6	0.000	0.000	.813
RM_7	0.000	0.000	.712
RM_8	0.000	0.000	.823
RM_9			
Rotation Sums of Squared Loadings			
Eigenvalues	4.923	2.367	1.325
% of Variance	14.065	6.762	3.785
Cumulative %	50.778	57.541	61.325

Note: Exploratory factor analysis of emotional intelligence skills: Three factors based on responses to 28 Items.

The EFA model was an exploratory factor analysis with 3 factors (Model for goodness-of-fit statistics). All parameter estimates are completely standardized over than 0.500. The 28 items of emotional intelligence skills.

2.2 In the exploratory factor analysis (EFA) using the principal component analysis (PCA) method, each component was extracted to identify variables that are interrelated within each item and are significant components of the emotional intelligence skills of students in Work-Integrated Learning (WIL) programs. The results showed a Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) of 0.924 and a Bartlett's Test of Sphericity Approx Chi-Square of 7953.503, df = 595. This indicates a statistically significant correlation at the 0.050 level, suggesting that the correlation matrix of the variables is suitable for subsequent confirmatory factor analysis of the student's emotional intelligence skills in WIL programs.

The Eigenvalues, which are the sum of squared component loadings for the 28 observed variables, revealed three components with Eigenvalues greater than 1. These three components accounted for 61.325 percent of the cumulative variance, indicating that the emotional intelligence skills of WIL students consist of three components, and 61.325 percent of the variance was explained by these components. The Initial Communalities analysis using the Principal Component method considered the variance of each variable, showing that all variables initially had a value of Post-extraction commonalities indicating that all variables had communalities higher than 0.500, with the lowest variable having a variance of 0.504. This suggests that all 28 observed variables belonged to one of the components. The factor loadings were considered for each variable to determine their appropriate component, with the criterion that factor loadings must be greater than 0.500. The exploratory factor analysis thus appropriately identified three components of emotional intelligence skills for WIL students, comprised of a total of 28 observed variables. Details are shown in Table 3.

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Table 4. Internal consistency of factors for emotional intelligence skills scale.

Factors/Abbreviation	Factor Correlations		
	Emotional Awareness (EA)	**Emotional Management (EM)**	**Relationship Management (RM)**
Emotional Awareness (EA)	1.000	.563**	.152**
Emotional Management (EM)	.563**	1.000	.605**
Relationship Management (RM)	.152**	.605**	1.000
Cronbach's .913	.866	.900	.873

Note1: *Indicates statistically significant difference level 0.05 (bilateral). **. Indicates a statistically significant difference at level 0.01 (bilateral).

2.3 All items loaded onto the 3 factors, indicating moderate to high factor loadings for the emotional intelligence skills factors ranging from .152** to .605**, EA to EM factors ranging from .563**, and EA to RM factors ranging from .152**, EM to EA factors ranging from .563** and EM to RM factors ranging from .605**, and RM to EA and EM factors ranging from .152**. The three items with the highest factor loadings for the emotional intelligence skills scale. Details are shown in Table 4.

Table 5. Confirmatory factor analysis of variance extracted emotional intelligence skills scale.

Factors	**Items**	**b**	**SE**	**h2**	**CR**	**AVE**
Emotional Awareness (EA)						
	EA_1	.728	.026	.530	.969	.557
	EA_2	.655	.031	.428		
	EA_3	.818	.020	.669		
	EA_4	.775	.023	.601		
	EA_5	.808	.020	.652		
	EA_6	.734	.026	.539		
	EA_7	.662	.031	.559		
	EA_8	.705	.028	.439		
	EA_9	.675	.030	.496		
	EA_10	.659	.031	.456		
	EA_11	.690	.031	.435		
Emotional Management (EM)						
	EM_1	.691	.030	.476	.942	.501
	EM_2	.739	.027	.478		
	EM_3	.711	.029	.546		
	EM_4	.654	.033	.505		
	EM_5	.738	.027	.427		
	EM_6	.722	.029	.545		
	EM_7	.663	.033	.522		
	EM_8	.748	.030	.439		
Relationship Management (RM)						
	RM_1	.828	.019	.497	.960	.627
	RM_2	.824	.019	.685		

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Factors	Items	b	SE	h2	CR	AVE
	RM_3	.805	.020	.678		
	RM_4	.716	.027	.647		
	RM_5	.819	.019	.513		
	RM_6	.793	.021	.670		
	RM_7	.677	.030	.630		
	RM_8	.735	.027	.658		
	RM_9	.690	.030	.541		

Note: CR is Composite Reliability, and AVE is Average variance extracted.

2.4 Besnoy (2016), argued that the Maximum Likelihood (ML) estimation of Likert-scale items produces negligible effects of non-normal non-continua data whenever each variable/item has at least 5 categories of response and a large sample size. However, severe effects of non-normal non-continuous data occur whenever each variable has 4 or fewer categories of responses and a small sample size which is less than 200. Under this condition, this study could only use 384 questionnaires for analysis and therefore, Bayesian estimation is recommended for re-affirming the previously conducted CFA Glaesmer (2012), section. The Bayesian CFA analysis was conducted in Mplus software to estimate the unstandardized weights produced by this analysis with the unstandardized loading obtained in the CFA using the Maximum Likelihood procedure.

This table shows the result of the Composite Reliability (CR) and Average variance extracted (AVE) to support the discriminant validity of constructs. The average CR and AVE values of two constructs. According to Fornell & Larcker (1981), the average variance extracted (AVE) should be more than the correlation squared of two constructs to support discriminant validity. Each AVE value is found to be more than the correlation square except for the correlation square of nonexploitative with economy of scale and economy of scale with timeliness which is higher than the AVE value and the difference is 0.0065 and 0.033. Since the difference is too small and upon researchers' discretion we conclude that there exists discriminant validity between the remaining constructs.

It is observed that the model's congruence of emotional intelligence skills for students in Work-Integrated Learning programs (WIL) with empirical data involves 3 components and 28 observable variables. Each component's factor loading is statistically significant at the 0.050 level. The factor loadings are arranged in descending order, with the highest being for Emotional Awareness (EA) at 0.818, followed by Emotional Management (EM) at 0.748, and the lowest for Relationship Management (RM) at 0.828. This indicates that Emotional Awareness (RM) has the highest factor loading among the three components. The results of the comparative analysis are shown in the following table 5.

Table 6. Consistency of the Mental Emotional Intelligence Skills Model of WIL Programs Student with Empirical Data.

Criteria	Consideration Criteria	Values Before Model Adjustment	Consideration Before Model Adjustment	Values After Model Adjustment	Consideration After Model Adjustment	Source
Chi-Square						
Chi-square x^2	-	931.249	-	617.796	-	(Hair, Sarstedt, Ringle, & Mena, 2012)
df	-	401	-	314	-	
P-value	> 0.050	< 0.050	Not Pass	< 0.050	Not Pass	
x^2/ df	< 3.000	2.400	Pass	1.970	Pass	
Absolute fit measure						
CFI	> 0.900	0.925	Pass	0.948	Pass	(Schermelleh-Engel, Moosbrugger, & Müller, 2003)
TLI	> 0.900	0.918	Pass	0.942	Pass	
RMSEA	< 0.050	0.059	Not Pass	0.050	Pass	
SRMR	< 0.050	0.041	Pass	0.039	Pass	

Notes: n = 384; * = significant at 5 percent level; ** = significant at 1 percent level; *** = significant at 0.1 percent level.

2.5 From Table 6, In the confirmatory factor analysis (CFA), the researchers analyzed three components, measured by 28 observed variables, to examine the construct validity of the measurement model. This analysis aimed to ascertain the details of each component of latent variables and observed

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variables in terms of factor loadings and their interrelations. As per Katsman (2016), This approach helps to understand the degree of association among the variables. After four iterations of model adjustments, the calculated statistical values met the criteria for analysis, indicating that the construct validity of the model was consistent with empirical data. The model examining the emotional intelligence skills of students in the Work-Integrated Learning (WIL) programs was found to be congruent with the empirical data. The model's consistency with empirical data is demonstrated by the following values: (x^2 = 617.792, df = 314, p = 0.000, x^2/ df = 1.970, CFI = 0.948, TLI = 0.942, RMSEA = 0.050, SRMR = 0.039). The results of this analysis align with the concepts and theories derived from the literature review and related research work.

Table 7. Structural Equation Multiple Cause and Multiple Indicator (SEM-MIMIC) model.

Variance (Effect to Cause variable (X) → Effect variable (Y)	**Factors (Latent variable)**		
	Emotional Awareness	**Emotional Management**	**Relationship Management**
	ß (p-value)	**ß (p-value)**	**ß (p-value)**
GEN (Male)	0.103** (0.045)	0.087 (0.090)	0.072 (0.153)
LEV (4)	0.007 (0.892)	0.118** (0.039)	0.141** (0.047)
GPAX (3.01 and above)	0.008 (0.883)	0.056 (0.307)	0.124** (0.023)
WIL (Humanities)	0.127** (0.020)	0.153** (0.005)	0.058 (0.533)

Note: *p < 0.05, **p < 0.01

2.6 Structural Equation Multiple Cause and Multiple Indicator (SEM-MIMIC) model

To examine the shared variance of potential impacts on emotional intelligence skills, it was found that Emotional Awareness (EA) consisted of 11 items with component weights EA1 = 0.333, EA2 = 0.689, EA3 = 0.590, EA4 = 0.549, EA5 = 0.666, EA6 = 0.691, EA7 = 0.672, EA8 = 0.725, EA9 = 0.595, EA10 = 854, and EA11 = 0.809 Emotional Management (EM) consisted of 8 items with component weights EM1= 0.758, EM2 =0.685, EM3 = 0.646, EM4 = 0.751, EM5 = 0.774, EM6 = 0.689, EM7 = 0.797, and EM8 = 0.677, and Relationship Management (RM) consisted of 9 items with component weights RM1 = 0.739, RM2 = 0.805, RM3 = 0.659, RM4 = 0.730, RM5 = 0.796, RM6 = 0.623, RM7 = 0.620, RM8 = 0.813, RM9 = 0.782 derived from standardized scores Standardized score as detailed in Table 7

The findings indicated that the SEM-MIMIC model, representing the structural relationship between emotional intelligence skills and demographic variables, detailed as follows:

1. Male affects Emotional Awareness (EA) (ß = 0.103**)
2. 4 Years of Study impacts both Emotional Management (EM) (ß = 0.118**) and Relationship Management (RM) (ß = 0.141**)
3. GPAX 3.01 and above affects Relationship Management (RM) (ß = 0.124**)
4. WIL of Humanities (English for Communication, Chinese Language, Thai Language) affects both Emotional Awareness (EA) (ß = 0.127**) and Emotional Management (EM) (ß = 0.153**)

The model's consistency with empirical data is demonstrated by the following values: $\chi 2$ = 832.892, df = 353, p = 0.000, $\chi 2$ /df = 2.360, CFI = 0.945, TLI = 0.924, RMSEA = 0.058, SRMR = 0.040 The R-Squared values of the SEM-MIMIC model, prepared by Mplus 7.12, could specify options in standardized scores in the OUTPUT command, indicating the variance explained in latent variables as Emotional Awareness (R2 = 0.036) Emotional Management (R2= 0.047) and Relationship Management (R2 = 0.041) respectively, with statistical significance differences at the 0.05 and 0.01 levels.

Discussion

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The research study titled "Impact of demographic backgrounds by humanities and social sciences students on their psychological of emotional intelligence skill: Structural Equation Multiple Cause and Multiple Indicator (SEM-MIMIC) models" Table 7 found that the majority of students interested in WIL programs are male, predominantly in their fourth year. These students in the WIL programs typically have a cumulative grade point average (GPAX) above 3.01. The most common fields of study in Humanities for WIL programs include English for Communication, Chinese Language, and Thai Language. Furthermore, students returning from work placements in WIL programs demonstrate significantly improved emotional intelligence skills compared to before their work experience, with statistical significance at the 0.050 level.

The Specified CFA model as in Table 6 showed the results of the three-factor CFA model of productivity values. The fit indices yielded (x^2 = 617.792, df = 314, p = 0.000, x^2/ df = 1.970, CFI = 0.948, TLI = 0.942, RMSEA = 0.050, SRMR = 0.039). All fit indices are more than adequate to conclude that there is no proof to say that this re-specified CFA model is incorrect. In other words, it indicated that the model fits the data or there was no significant difference between the revised model and the observed model after re-specification or adjustment on the initial hypothesized CFA model after taking into consideration the modification indices (MI) and several rules of thumbs in confirmatory factor analysis (CFA) approach. The loadings range was from 0.654 to 0.828 and succinctly the convergent validity for productivity values is also supported. As a result of the discussion, goodness of fit index results suggest that the proposed model did generate the observed covariance matrix. Simply said, the three-dimensional productivity values fit the university value-based productivity of the CFA model. From the overall re-specified model, we can simply say that the university productivity must focus on these core values to bring the organization especially the university accelerated excellence.

Similarly, the value of RMSEA marks insignificant discrepancies between the observed covariance and implied matrices thereby supporting the degree of fit. One purpose of the study was to validate the values of the emotional intelligence skill framework as suggested by (Ab Hamid, 2011). This study offered evidence of those three dimensions of the CFA model that generated the data collected from the university's staff in one of the universities in Asia. Implicitly, this study hinted at earlier works that the values are important in driving the university toward excellence (Hui et al, 2004).

1. The examination of the consistency of emotional intelligence skills revealed that the model is congruent with empirical data from humanities and social sciences students enrolled in WIL programs. Bar-On (2005), demonstrated that all 28 indicators are significant in each component, truly representing and impacting emotional intelligence skills reliably, allowing stakeholders to utilize this tool effectively. This was possible because the researcher synthesized emotional intelligence skill indicators after studying concepts, theories, and related research literature, and then applied them to the sample group, i.e., humanities and social sciences students in WIL programs who have completed more than 16 weeks or one academic semester of workplace experience (Mayer, 2008).

2. The relationship between each aspect of emotional intelligence skills (3 aspects) and all indicators (28 indicators) showed a moderate to high positive correlation, with correlation coefficients ranging from 0.152 to 0.605. This indicates that the three components, namely 1) emotional awareness, 2) emotional management, and 3) relationship management, have positive attitudes towards each other, and the overall relationship is not independently separated. This means that the psychological outcomes of each emotional intelligence skill component of humanities and social sciences students can perceive and understand their emotions when encountering work-related situations and daily life, consistent with Mohr (1994), who mentioned that effective collaboration requires open communication for information exchange, goal setting, and planning. Learning differences for collaboration align with Wentzel (1999), indicating a societal level of understanding and acceptance towards collaboration, where members should share common goals to ensure mutual understanding for achieving work objectives, and consistent planning is crucial for success. This is supported by Przybylski (2013), who emphasizes that individuals coming together must have mutual benefits from their collective work, achieved through cooperation and coordination. Boyatzis (2018), also highlighted that managing one's emotions stems from the foundation of adaptability, leading to intelligent conflict resolution and self-development for sustainable teamwork, in line with Shah (2019), who found that emotional management involves regular

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self-reflection to identify and resolve issues collectively to enhance teamwork, skills, and knowledge. These components contribute to the development of teamwork skills with others in an organization, showing that students have components of emotional intelligence after returning from work placements and managing relationships effectively, resonant with Carmeli (2003), emphasizing learning, respect, support, and trust as essential for multicultural team collaboration and conflict management, supporting sustainable cooperation (Mischenko, 2022).

Individuals are capable of managing their emotions quite effectively, aligning with Sklad (2012), who discussed that individuals coming together must share mutual benefits from their collective work, arising from the cooperation and coordination of members to ensure the success of joint efforts. This adaptation for creative collaboration corresponds with Grandey (2000), suggesting that managing one's emotions comes from the foundation of adapting from one environment to another, fostering teamwork, and allowing members to intelligently manage emotions amidst conflicts and develop themselves for sustainable collaboration with others. This is in line with Samanta (2020), who found that the role of emotional management involves consistently thinking and reviewing past work methods to identify and collaboratively resolve issues for the improvement of teamwork, including the development of knowledge, abilities, and skills for collaborative work among members, which facilitates mutual benefits in teamwork. These components lead to the development of teamwork skills with others within an organization. Students from the faculties of humanities and social sciences possess components of emotional intelligence after returning from work placements and have been found to manage relationships with people around them effectively. This aligns with Adha (2022), who emphasizes that multicultural team collaboration should involve learning common goals, mutual respect, positive attitudes towards the value of differences among colleagues, support, assistance, trust, good interactions, communication, and learning to adapt and manage conflicts, which are factors that support sustainable collaboration (MacCann et al, 2020).

The research analysis successfully achieved the objectives by demonstrating that the data could analyze both the exploratory and confirmatory factor analysis of emotional intelligence skills. It was found that students in Work-Integrated Learning programs (WIL) in the humanities and social sciences have developed emotional intelligence skills in areas of 1) emotional awareness, 2) emotional management, and 3) effective relationship management. These factors were analyzed through confirmatory factor analysis techniques, showing significant interrelationships and relevance. Moreover, the analysis could measure and predict the development of emotional intelligence skills before and after students engaged in work experiences exceeding 16 weeks or more than one academic semester in various types of WIL activities. Emotional Intelligence (EI) skills can develop in everyone, and if students can adapt and connect with individuals and situations, it significantly impacts their academic success (Hopkins & Yonker, 2015).

Research indicates that the essential components or attributes in an individual's emotional intelligence include knowledge, skills, and positive attitudes (Bora, 2015), aligning with Sharma (2021), suggests that possessing emotional intelligence skills promotes knowledge, capability, and vision for life and career development (Johnson, 2019). The role and content of teaching in the WIL format, where students engage in work placements for more than 16 weeks or more than one academic semester, can significantly affect their emotional intelligence, enhancing systematic thinking and broadening their perspectives beyond classroom learning (Pishghadam, 2022).

Research limitations

1. The selection of only four types of demographic variables, which, if expanded, could reveal more causal variables affecting emotional intelligence skills.

2. The diversity of WIL programs for humanities and social sciences students, where the sampled programs were only 1) cooperative education and 2) internships, suggests future research should broaden its scope.

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Recommendation

Applying research Recommendations

1. Higher education institutions should develop courses or practical training programs that focus on accessing and enhancing emotional intelligence skills, providing guidance, and fostering the development of emotional intelligence.

2. Administrators and academics should support avenues for promoting and developing students' professional skills. Administrators should establish cooperative education centers and career development centers, as these will offer services, advice, and suggestions for activities related to the implementation of Work-Integrated Learning curricula (WIL).

3. Course directors or department heads should invite representatives from businesses that are part of the network managing education integrated with work, as well as members of the WIL programs committees, to teach and lecture in classes and activities both on and off-site.

Future research recommendation

1. Future studies should incorporate feedback from businesses regarding employment skills, emotional intelligence, and the potential of students who have completed work placements in WIL programs.

2. The background data of WIL students should be analyzed in conjunction with variables related to emotional intelligence skills.

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