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Measuring Global Competence of Undergraduate and Postgraduate Students

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ABSTRACT: *Twenty-first century students live in an interconnected, diverse and intensively changing world. Developing intercultural and global competences is of major importance. In such a context this study comes to investigate global competence of 336 undergraduate and postgraduate students through a quantitative methodology. Convenient and snowball sampling techniques were followed, whereas the data were analyzed with the statistical software SPSS 27.0 for Windows. According to the findings, most of the students demonstrate high levels of competence and some variables, such as gender, age, study program and level of ICT knowledge seem to affect some of the sub-scales.*

KEYWORDS: undergraduate and postgraduate students, global competence, knowledge, skills, attitudes, values

INTRODUCTION

Globalization describes the movement and circulation of people, ideas, services, products and notions outside national borders, whereas the globalised world is characterized by different types of interconnectivity and communication, such as educational, economic, cultural and political (Yang, Yinb, & Wuc, 2020). Friedman, referring to the phenomenon of globalization, argues that we have moved from connection to hyper-connection (as cited in Andreadakis, Karanikola, Konsolas, & Panagiotopoulos, 2019). In such a context, internationalization has become a trend and an important point of reference for higher education policies. Undergraduate, graduate and postgraduate students are expected to communicate and collaborate internationally and develop global competence (Yang, Yinb, & Wuc, 2020).

Globally competent students have the capacity to be active citizens and participate reflectively in local and global issues, to investigate the world beyond their immediate environment, to recognize not only their own perspectives but others' as well and to communicate ideas with diverse audiences effectively by overcoming geographic, linguistic and cultural obstacles. It is also worth mentioning that global issues and current events, such as environmental problems, demographic changes, economic crisis, world conflicts, human rights, equality, climate change, sustainability, call for interdisciplinary and not disciplinary approaches (Mansilla & Jackson; PISA, 2018).

So students should develop and integrate knowledge, skills, methods from different scientific fields in order to solve problems, create new ideas, adopt a critical understanding of globalization, reflect on how they and their nations are implicated in local and global problems, and engage in intercultural perspectives (Kopish, 2016; Trede, Bowles, & Bridges, 2013).

Theoretical underpinning

Defining and measuring global competence

Global competence could be conceived as a conceptual framework underpinned by equality, social responsibility and human rights. Specifically, it moves beyond individual and national perspectives and encourages citizens to reflect, explore global relations of power and privilege and how culture and knowledge are constructed and to take action against inequality, exclusion and human rights violation (Kopish, 2016). In addition, according to Hunter (2004), global competence means being open-minded, seeking to understand expectations and perspectives of others, communicating and working effectively in diverse environments. Global-mindedness is also highlighted by the PISA (2018), since it helps individuals exercise agency with a critical awareness, change their vision, and live with dignity within cultural diversity.

There are many scales attempting to measure global competence. Most of them focus on some dimensions of global competence with an emphasis on personality traits, intercultural competence and intercultural sensitivity. For instance, Multicultural Personality Questionnaire, which was created by Van der Zee and Van Oudenhoven (2013), focuses on some personality traits such as cultural empathy, open-mindedness, emotional stability, social initiative and stability, whereas Intercultural Competency Scale measures intercultural effectiveness (Elmer, 1986). Similarly, Deardorff (2011) proposed an intercultural conceptual model with three dimensions: knowledge and comprehension, skills and attitudes. Towards this direction, Hunter et al. (2006) proposed a three-dimensional global competence scale that includes knowledge, attitudes and values in order to assess college graduates, whereas Morais and Ogden (2011) created the Global Citizenship Scale which included the dimensions of social responsibility, global competence and global civil engagement. Finally, Yang Liua, Yue Yinb and Ruilin Wuk's scale (2020) includes three dimensions (knowledge and understanding, skills, attitude and values), nine sub-factors (world knowledge, understanding globalization, international academic knowledge, use of tools, cross-cultural communication, international academic communication, intent to interact, open attitude and values) and thirty five items. The last mentioned scale was used to cover the needs of this specific research, since it focuses mostly on the field of the higher education.

METHODOLOGY OF RESEARCH

Research objective, research tool and data analysis

This paper comes to investigate students' level of knowledge, skills, attitudes and values about global competence and whether there is a correlation between global competence, gender, study program, age and level of ICT knowledge.

The quantitative methodology was followed by using the questionnaire "Measuring Students' Global Competence" (Yang Liua, Yue Yinb, & Ruilin Wuk, 2020). This questionnaire is based on three axes -knowledge and understanding, skills, attitude and values- and consists of 35 close-ended. Participants were called to answer on a five-point Likert scale (1 = Not at all, 2 = A little, 3 = Enough, 4 = A lot, 5 = Too much), whereas the data were collected in June 2022 with an electronic questionnaire which was delivered to students' emails. The sample of the study consists of 336 undergraduate and postgraduate students who were chosen through a combination of convenient and snowball sampling techniques. These techniques are usual types of sampling in relative researches and their main criterion is participants' having the characteristics needed for the research (Babbie, 2011; Dörneyei & Kata, 2011).

The data were encoded and analyzed with the statistical software SPSS 27.0 for Windows. Regarding the reliability of the internal consistency of the three dimensions of the questionnaire (Table 1) is high as it ranges from 0,881 έως 0,911>0,70. In addition, the values of the correlation indices range from +0,363 έως +0,794>+0,3 indicating high internal consistency of the dimensions.

Table 1. Reliability of Scale

Dimensions	N of Items	Corrected Item-Total Correlation	Cronbach's Alpha
Knowledge and understanding	10	0,611-0,713	0,897
Skills	14	0,440-0,794	0,911
Attitudes and values	11	0,363-0,772	0,881
Global competence	35	0,329-0,686	0,943

Findings

336 undergraduate and postgraduate students responded to the questionnaire of this research. 69,6% of the participants are women and 60,4% men. 52,7% belong to the age group of 27 and over, 31,3% to the age group of 18-22 and 16,1% to the age group of 23-26 years. Regarding the study program, the majority (56,3%) derive from a postgraduate program and 43,8% participate in an undergraduate program. Regarding the level of ICT knowledge, the majority (78,6%) estimates that it is very good, 15,2% that is at a moderate level and 6,3% at a low level.

Regarding the responses of the sampled students for the Knowledge and Understanding sub-factors (Table 2), the mean value for global knowledge is 3,47 (enough), for understanding globalization 3,63 (a lot) and for international academic

knowledge 3,45 (enough). Overall for the dimension of Knowledge and Understanding the average value is 3,60 (a lot).

Table 2. Distribution of Mean Values and Standard Deviations for Knowledge and Understanding

Dimensions	Sub-factors	Items	MEAN	SD
Knowledge and Understanding	1) World Knowledge (WK)	Q1 Other than my own country, I know about the history and geography of at least one other country.	3,38	0,068
		Q2 Other than my own country, I know about the political and economic systems of at least one other country.	3,33	0,07
		Q3 Other than my own country, I know about the language, cultural norms, religions, beliefs, and customs of at least one other country.	3,69	0,058
		Total	3,47	0,059
	2) Understanding Globalization (UG)	Q4 I understand the globalization concept and its development trends.	4,04	0,053
		Q5 I understand the effect of globalization on a country's development, individual lifestyles and scientific research activities.	3,92	0,053
		Q6 I understand the roles of international organizations and institutions in today's world and society.	3,68	0,059
		Q7 I pay attention to global events and international affairs.	3,82	0,047
		Total	3,63	0,062
	3) International Academic Knowledge (IAK)	Q8 I know the internationally accepted theories and schools of thought in my field of study or profession.	3,61	0,059
		Q9 I know the international cutting-edge research problems, issues, and theories in my field of study or profession.	3,39	0,052
		Q10 I know the main internationally accepted research methods in my field of study or profession	3,36	0,058
		Total	3,45	0,050
	Total knowledge and Understanding		3,60	0,043

Regarding Skills sub-factors (Table 3), the mean value for use of tools 4,11 (a lot), for cross-cultural communication 3,76 (a lot) and for international academic communication 2,52 (enough). Overall for the Skills dimension the average value is 3,39 (enough).

Table 3. Distribution of Mean Values and Standard Deviations for Skills

Dimensions	Sub-factors	Items	MEAN	SD
Skills	1) Use of tools (UT)	Q11 I can easily read and write in one foreign language.	3,92	0,061
		Q12 I can easily use MS Office, PDF Reader and other common international software.	4,27	0,055
		Q13 I can easily browse foreign language websites to obtain knowledge and the requisite information.	4,14	0,058
		Total	4,11	0,048
	2) Cross-cultural communication (CCC)	Q14 I can analyze and evaluate issues from the perspective of a foreign culture.	3,59	0,061
		Q15 I have made efforts to understand foreigners so that we can work or live together	3,90	0,060
		Q16 I can be aware of cultural differences in my interactions with people from different cultures.	4,04	0,057
		Q17 I am able to quickly communicate in a common language in my interactions with people from different cultures	3,79	0,059
		Q18 I have the ability to adjust to language and communication outside of my own culture.	3,71	0,057
		Q19 I can learn, work, and live outside of my own culture.	3,53	0,059
		Total	3,76	0,048
	3) International Academic Communication (IAC)	Q20 I can easily comprehend foreign literature in my field of study or profession.	3,43	0,070
		Q21 When faced with problems in understanding professional literature, I can take the initiative to contact and consult the author	2,58	0,072
		Q22 I made efforts to publish papers in SCI, SSCI, ISTP, EI, and other indexed journals or conferences with my supervisors.	1,99	0,073
		Q23 I can actively seek foreign scholars to discuss research questions and issues at international academic conferences.	2,29	0,069
		Q24 I can easily discuss research questions and issues with foreign scholars at international academic conferences.	2,32	0,063
		Total	2,52	0,055
	Total Skills		3,39	0,043

Regarding respondents' responses about Attitude and values sub-factors (Table 4), the mean value for intent to interact is 3,97 (a lot), for open attitude 4,53 (too much) and for values 3,40 (a lot). Overall for the Attitude and values dimension the average value is 4,05 (a lot). Regarding the Global competence as a whole (nine factors) the average value is 3,66 (a lot).

Table 4. Distribution of Mean Values and Standard Deviations for attitudes and values

Dimension	Sub-factors	Items	MEAN	SD
Skill and attitudes	1) Intent to Interact (II)	Q25 I would like to spend time and energy in interacting with foreigners and establishing contacts.	3,76	0,062
		Q26 I would like to experience life and culture in other countries (such as through tourism).	4,37	0,05
		Q27 I would like to take the risk to experience cross-cultural learning and personal development (such as through overseas study and work).	4,00	0,061
		Q28 I would like to go abroad and experience foreign countries' academic and research environments.	3,97	0,062
		Q29 I would like to consult foreign scholars in my areas of interest at international academic lectures and report sessions.	3,74	0,064
		Total	3,97	0,049
	2) Open Attitude (OA)	Q30 When communicating with foreigners, I try to respect their cultures and values.	4,58	0,043
		Q31 When communicating with foreigners, I try to understand their cultures and values.	4,46	0,048
		Q32 When communicating with foreigners, I try to appreciate their cultures and values.	4,54	0,041
		Total	4,53	0,041
	3) Values (V)	Q33 I identify with my own country's culture and values	3,58	0,058
		Q34 I believe that my worldview is one of many equally valid worldviews.	3,77	0,062
		Q35 I consider myself valuable to my country and society.	3,76	0,063
		Total	3,70	0,050
	Total Attitude and values		4,05	0,038
	Total Global Competence		3,66	0,035

Pearson correlation coefficient of the nine factors for global competence demonstrates a statistically significant positive correlation between them. There is no statistically significant correlation between International Academic Communication and Open

Attitude (r=0,128, p>0,01). Higher levels of statistically significant positive correlation are recorded between World Knowledge and International Academic Knowledge (r=0,602), Use of tools with Cross-cultural Communication (r=0,617) and Intent to interact with Open attitude (r=0,615). Lower levels of statistically significant positive correlation are recorded between World Knowledge and Open attitude (r=0,263), between International Academic Knowledge and Open Attitude (r=0,258), between Use of Tools and Values (r=0,244) and between International Academic communication with Values (r=0,243).

Pearson correlation coefficient of the three dimensions for global ability demonstrates a statistically significant positive correlation at relatively high levels. Between Knowledge and understanding with Skills (r=0.635) and at lower relative levels between Knowledge and understanding with Attitude and values (r=0.495) and between Skills and Attitude and values (r=0.553).

Table 5. Correlation Testing of the Three Dimensions of Global Competence

		1	2	3
1	Knowledge and understanding	-		
2	Skills	0,635**	-	
3	Attitude and values	0,495**	0,553**	-

***Correlation is significant at the 0.01 level (2-tailed).*

Correlation of Global Ability with gender, study program

The data were analyzed using T-test independent samples in order to test if there is a statistically significant difference in the perceptions of the respondents based on gender and study program. Thus, for knowledge and understanding, the mean values for men and women are statistically significantly different from each other [t(334)=6,114, p-value=0,000<0,05]. Therefore, men agree to a greater extent (mean=3,95) than women (mean=3,45) about knowledge and understanding. For skills the mean values for men and women are statistically significantly different from each other [t(334)=2,617, p-value=0,009<0,05]. Therefore, men agree to a greater extent (mean=3,56) than women (mean=3,32) about skills. Regarding attitudes and values, the mean values for men and women do not differ statistically significantly [t(334)=1.148, p-value=0,252>0,05],

In addition, for knowledge and understanding, the average values for the participants of the two study programs do not differ statistically significantly from each other [t(334)=-0,874, p-value=0.383>0.05]. For skills the average values for students (undergraduate and postgraduate) differ statistically significantly from each other [t(334)=-5.880, p-value=0.000<0.05]. Therefore, postgraduate students agree to a greater extent (mean=3.66) than undergraduate students (mean=3.18) about skills. Regarding attitudes and values, the average values of the participants of the two study programs do not differ statistically significantly from each other [t(334)=-0.933, p-

value=0.000<0.05]. Therefore, there is no statistically significant difference between them in their perceptions of Attitude and values.

Correlation of Global Ability with age and ICT knowledge

One-Way Anova was used to test the difference between the mean values of knowledge/understanding, skills and attitude/values with the age groups and ICT knowledge of the participants. According to the findings, there is no statistically significant difference (F(2)=0,501, p=0,606>0.05) between Knowledge and understanding with age and between Attitude/values with age (F(2)=0,636, p=0,530> 0.05. However, there is a statistically significant difference (F(2)=6,8978, p=0,001 <0,05) of the level of Skills with the age of the respondents according to their perceptions. Comparisons of mean values show that statistically significant differences of Skills with age are found between the age categories "27 and over" and "18-22" (p=0,000<0,05).

The findings of the analysis of variance for the three dimensions of Global Competence show that there is a statistically significant difference according to the participants' perceptions of the level of ICT knowledge with: a) Knowledge and understanding [F(3)=9,813, p=0,000< 0,05], b) Skills [F(2)=18,861, p=0,000<0,05] and c) Attitude and values [F(2)=3,815, p=0,010<0,05].

Multiple regression with Knowledge and Understanding as a dependent variable

The effect of the independent variables (gender, age, study program, ICT knowledge, skills, attitude and values) on the dependent variable Knowledge and understanding was checked through the analysis of the linear multiple regression. The normality of the dependent variable was first checked with the One Sample Kolmogorov-Smirnov Test according to which a normal distribution follows (p> 0,05). The independent variables affect the dependent variable (p <0,05) and therefore the regression model exists.

Gender, age, study program, *ICT knowledge*, skills, attitude and values explain 48,6% (R^2=0,486) of the knowledge/understanding according to participants' perceptions (Table 6).

Table 6. Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0,704[a]	,495	,486	5,631	1,945

a. Predictors*: (Constant), gender, age, study program, ICT knowledge, skills, attitude and values.*
b. Dependent Variable: *Knowledge and understanding*

The regression model equation is of the form Y=bo+b1x1+b2x2+b3x3, Knowledge and understanding=17.283-3.571 * Gender + 0,378 * Skills +0,195 * Attitude and values. Therefore, if gender increases by one unit (female based on coding) and the other independent variables remain constant, then Knowledge and Understanding will decrease by 3.571 units. If Skills increase by one unit and other variables remain constant then Knowledge and Understanding will increase by 0,378 units. If Attitude and values increase by one unit and the other variables remain constant then Knowledge and understanding will increase by 0,195 units. The variable Gender seems to be the most important variable as its absolute value is the largest of all the other variables (B =-3,571). The independent variables age, study program and ICT knowledge do not affect the dependent variable Knowledge and Understanding (p>0,05).

The regression control after the completion of the model shows that there is a normal distribution of residues (Figure 1). The Durbin-Watson test = 1,945<2,00 indicates that there is residual independence (Figure 2)

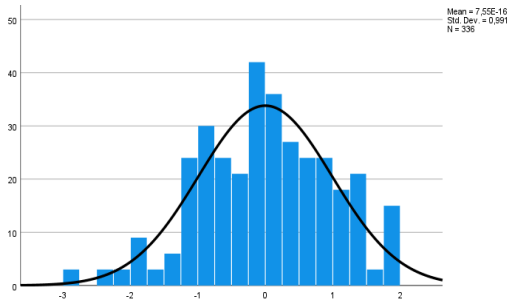

Figure 1 *Residual Distribution Curve*

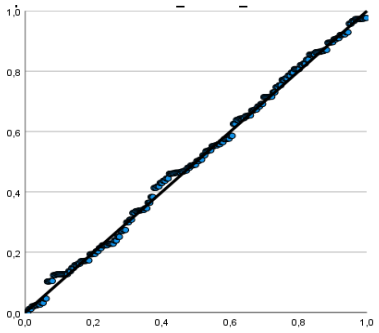

Figure 2 *Control of Normal Residual Distribution*

Homoscedasticity testing shows that the residues are not related to each other (Figure 3).

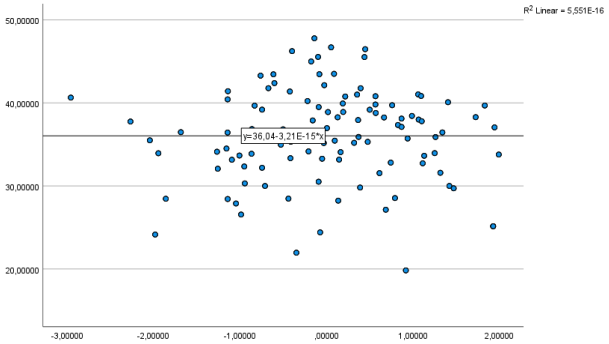

Figure 3 *Residue Homoscedasticity Testing*

Also, the Pearson correlation test shows that there is no correlation of residue variables (p = 1,000> 0,05). Finally, collinearity testing shows that there is a marginal

independence of the variables and therefore the regression model is not affected (VIF <2,00).

Multiple regression with skills as a dependent variable

Gender, age, study program, ICT knowledge, Knowledge and understanding, attitude and values explain 57,6% (R^2=0,576) of participants' perceptions about skills. The regression model equation is of the form Y=bo+b1x1+b2x2+b3x3+b4x4, Skills=-12,122+6,181* Curriculum +2,286 * ICT Knowledge + 0,610 * Knowledge and Understanding +0,434 * Attitude and Values. Therefore, if the program of study increases by one unit (postgraduate as coded) and the other independent variables remain constant, then Skills increases by 6,181 units. If ICT Knowledge increases by one unit and other variables remain constant then Skills will increase by 2,286 units. If Knowledge and understanding increase by one unit and other variables remain constant then Skills will increase by 0,610 units. If Attitude and values increase by one unit and other variables remain constant then Skills will increase by 0,434 units. The study program variable appears to be the most important variable as its value is the highest among all other variables (B=6,181). The variables gender and age do not seem to influence the dependent variable Skills (p>0,05).

The regression control after the model's completion shows that there is a normal distribution of residues. The Durbin-Watson test = 1,868<2,00 indicates that there is residual independence.

Homoscedasticity testing shows that the residues are not related to each other. Also, the Pearson correlation test shows that there is no correlation of residue variables (p = 1,000> 0,05). Finally, collinearity testing shows that there is a marginal independence of the variables and therefore the regression model is not affected (VIF <2,00).

Multiple regression with attitude and values as a dependent variable

Gender, age, study program, ICT knowledge, knowledge and understanding and skills explain 34,8% (R^2=0,348) of participants' perceptions about attitude and values.

The regression model equation is of the form Y=bo+b1x1+b2x2, Attitude and values=23.666+ 0.238* Knowledge and understanding +0.328 * Skills. Therefore, if Knowledge and understanding increases by one unit and the other independent variables remain constant, then Attitude and values will increase by 0.238 units. If Skills increase by one unit and other variables remain constant then Attitude and values will increase by 0.328 units. The variables gender, age, study program, ICT knowledge do not affect the dependent variable Attitude and values (p>0.05).

Checking the regression after model's completion shows that the residuals are normally distributed. The Durbin-Watson test=1,719<2,00 indicates that there is independence of residuals. The homoscedasticity test shows that the residuals are not correlated with each other. Also, the Pearson correlation test shows that there is no correlation of residual variables (p=1,000>0,05). Finally, the collinearity test shows that there is independence of the variables and consequently the regression model is not affected (VIF~2,00).

DISCUSSION

Preparing globally and interculturally competent students is an issue of major importance in Greece, since, according to the Operational Data Portal, more than 155.000 refugees have arrived in our country since 2017, deriving mostly from Afghanistan, Somalia, the State of Palestine, Iraq and Syria (Karanikola, Katsiouli, & Palaiologou, 2022).

Some important findings emerge from this research. To begin with, the mean value for most of the sub-factors of the scale is very high, whereas those presenting lower mean values are global knowledge, international academic knowledge and international academic communication (enough). This could be explained due to the fact that international academic requirements bring further challenges to students in non-speaking countries mainly in cases there is no English proficiency (lingua franca). It is not probably easy for students to read and write academic papers in a foreign language or to develop social interactions with colleagues and students from other countries. Consequently, language could be an obstacle to overpass (Huttner-Koros, 2015; Pyne, Dinwoodie, & Roe, 2007). Some other obstacles could be financial constraints or limited opportunities and positions to travel or study abroad (Flammia, Sadri, & Mejia, 2019).

On the other hand, higher institutions could contribute to their students' global competence development. Some effective practices could be to enrich curricula, to conduct projects, to promote interaction between students through their mobility (e.g. Erasmus+), to apply eLearning applications and collaborative learning, fund students to study abroad, and hire international scholars to teach in their institutions (Ngai, Lee, Kei Ng, & Wu, 2019; Yang Liua , Yue Yinb , Ruilin Wuc, 2020).

Regarding the effect of the variables on the scale, we can see that *Skills* dimension is affected by the variables of age, gender, program study, level of ICT, then *Knowledge and understanding* dimension is affected by gender and finally *Attitude and values* seem to be affected by the level of ICT. These findings are in alignment with a similar research which was based on the same scale but the participants were teachers working in primary and secondary education in the region of Western Greece (Karanikola, 2022). Specifically, it was found that most of the participants feel very confident regarding most of the sub-scales, whereas lower mean values were demonstrated in the sub-scales of international academic knowledge and international academic communication (enough).

CONCLUSION AND FUTURE PROPOSALS

This research comes to shed light on undergraduate and postgraduate students' knowledge, skills, attitudes and values of global competence. In addition, it could be a cause for fruitful dialogue, reflection and further discussion and research, given that it is the first research conducted in the field of higher education based on the specific scale. However, this particular research has its limitations and the results cannot be generalized for the whole population. Thus, a survey that includes a bigger sample would provide a comparative and safer view of the topic. In addition, the combined

use of a quantitative and a qualitative methodological approach could also provide us with more insights and enrich the research with supportive, new or supplementary findings regarding universities' practices, proposals and policies towards this direction.

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