Students' attitudes towards Learning Big Data, Analytics and AI algorithms: The case of Greek students

Lazaros Anastasiadis
University of Crete
Greece

Poulcheria Zirinoglou
Hellenic Open University
Greece

Abstract

Nowadays, Universities all over the world are studying students' capability of learning analytics, Big Data applications and algorithms. Many researchers are studying students' attitudes toward these subjects in order to foresee students' preservation, capture students' behaviors and enhance students learning by providing feedback and support. A sample of 165 Greek students participated in the study. The study used an instrument named SATBDAAIA (Students' attitudes towards learning Big Data, analytics and AI algorithms), that is a five-point Likert scale. The scale consisted of six conceptual constructs named Difficulty, Cognitive Competence, Affective, Value and Motivation, Ethical issues. Greek Students' attitudes towards Learning Big Data, Analytics and AI algorithms were evaluated by another item that rate from 1 to 100 scaling the total score. The results indicated that they have a positive direct effect on Total score related to Greek Students' attitudes towards Learning Big Data, Analytics and AI algorithms. In addition, gender has not any significant role on shaping Greek students' attitudes towards Learning Big Data, Analytics and AI algorithms.

Keywords: Learning Big Data, Analytics, AI algorithms, Ethical issues

1.Introduction

The teaching of big data should concentrate on 3 areas: Cloud structures (Souravlas & Katsavounis, 2019; Souravlas, 2019), algorithms for stream processing (Souravlas, Anastasiadou & Katsavounis 2021; Souravlas & Anastasiadou, 2020; Tantaraki et al., 2020a, Tantalaki, et al., 2020b, Souravlas, Katsavounis, Anastasiadou. 2020; Tantalaki, et al., 2019) and applications (Tantalaki, Souravlas, & Roumeliotis, 2019). The cloud structure refers to the hardware and software needed to implement the cloud. Some knowledge of computer organization and architecture as well as computer networks is needed here. The algorithms refer to the way the receiving data streams are efficiently assigned to the various working elements for processing. Some knowledge of parellel processing and data distribution methods is necessary (Souravlas & Roumeliotis, 2015a; Souravlas & Roumeliotis, 2015b; Souravlas & Roumeliotis, 2014a; Souravlas & Roumeliotis, 2014b; Margaris et al., 2007). Finally, the number of big data applications refers to understanding the numerous big data applications that affect all aspects of our everyday life, education (Florou et al., 2021; Valsamidis et al., 2021), marketing, agriculture and food and so on.

Many researchers argued that although Big Data advance innovative research at the same time raise ethical questions and challenges related to individuals' privacy violation, informed consent (Howe III & Elenberg, 2020) equity, fairness, ethics, information governance and security etc (Car et al., 2019), methodological issues like legal and ethical issues (Lee &Yoon, 2017) and bias Bellazzi (2014)

Big Data together with advanced analytical approaches usage related to Artificial Intelligence (AI) have significant impact on many sciences, especially on medicine (Car et al., 2019). Big data analytics regularly take advantage of analytic methods created in data mining, involving classification and regression. (Lee &Yoon, 2017). Bellazzi (2014) argued that Big Data necessitate new architecture techniques, algorithms and analytics to handle it and extract value and obscure knowledge for it.

Artificial Intelligence (AI) is the ability of a computer to act and conduct operations that usually supposed to require human intelligence. Machine learning is considered as the core concept in Artificial Intelligence (AI). In addition, Artificial Intelligence (AI) is a modern comprehensive technical discipline that seeks theories, processes, tools and applications tools for simulating the increase and enlargement of human intelligence. Artificial Intelligence (AI) aiming to make machines capable of dealing with more sophisticated and complicates tasks that demand humans' intelligence to carry out (https://pub.towardsai.net/basic-concepts-of-artificial-intelligence-and-its-applications-294fb84bfc5e). Artificial Intelligence (AI) can analyze Big Data in order to make patterns that in a different situation they possibly continue to stay undetected by human supervision. Image recognition, voice recognition, autonomous driving are some of major applications of AI. Many other applications are well done as those related to telecommunications industry, to health informatics, to medicine, to consumer finance etc.

we are also realistic that these application concern remain about privacy, equity, security, and benefit to all. This the present study tries to capture Greek students' attitudes towards Learning Big Data, Analytics and AI algorithms, in the frame of Difficulty Cognitive Competence Affective Value Motivation Ethical issues conceptual constructs.

2. Purpose of the study-Research Hypotheses

The objective of current study is to evaluate Greek Students' attitudes towards learning Big Data, analytics and AI algorithms through multidimensional statistical analysis. In addition, the present paper examines the following research hypotheses.

Ho1: Difficulty has a strong effect on General attitude towards learning Big Data, analytics and AI algorithms
Ho2: Cognitive Competence has a strong effect General attitude towards on learning Big Data, analytics and AI algorithms
Ho3: Affective has a strong effect General attitude towards on learning Big Data, analytics and AI algorithms
Ho4: Value has a strong effect on General attitude towards learning Big Data, analytics and AI algorithms
Ho5: Motivation has strong effect on General attitude towards learning Big Data, analytics and AI algorithms
Ho6: Ethical issues has a strong effect on General attitude towards learning Big Data, analytics and AI algorithms
Ho7: Creative has a strong effect on General attitude towards learning Big Data, analytics and AI algorithms
Ho8: Gender influences General attitude towards learning Big Data, analytics and AI algorithms

3. The instrument

The study used a 5-point response scale, higher scores then correspond to more positive attitudes, whereas 1 corresponding to strongly disagree to 5 strongly agree. The scale named SATBDAAIA (Students' attitudes towards learning Big Data, analytics and AI algorithms) consists of 46 items grouped into six conceptual constructs (Table 1).

The six components/ conceptual structures were named 1. Difficulty (e.g. Dif1: There is a great deal of complexity in many AI algorithms). According to Anastasiadou (2002) Difficulty viewed as attitudes toward the problems, the obstacles, the difficulties in compressing a subject as Big Data Systems, Analytics and AI algorithms (Anastasiadou, 2004a, 2004b, 2004c, 2004d, 2009a, 2009b; Dauphinee et al., 1997, Schau, et al., 1995). Other indicators of this conceptual construct are AI algorithms complexity, scheduling of Big Data Stream, Modeling and Simulation related to Cloud Computing, efficiency of AI algorithms, advance knowledge in analytics, in mathematics as was as in AI, advance programming skills requirements (Souravlas & Anastasiadou, 2020a, Souravlas, et al., 2020a) (Table 1).

2. Cognitive Competence (e.g. I can learn Analytics easily). The Cognitive Competence conceptual construct measures students' ability and skills to understand and efficiently learn Analytics, AI algorithms and Big Data systems (Anastasiadou, 2005a, 2005b, 2005c; Anastasiadou & Gagatsis, 2005a, 2005b) (Table 1).

3. Affective (e.g. I enjoy taking AI lessons). (Anastasiadou & Chadjipantelis, 2008; Anastasiadou, Elia, Gagatsis, 2007; Anastasiadou & Gagatsis, 2007; Anastasiadou, Gagatsis, Elia, 2005) (Table 1).

4. Value (e.g. Big data systems are important for decision making). Value is the conceptual construct that examines students' perceptions about the usefulness of Analytics tools, AI algorithms and Big Data systems both in professional life and everyday life (Anastasiadou & Papadimitriou, 2001, 2003; Anastasiadou, 2007a, Anastasiadou, 2007b; Anastasiadou, 2008a, 2008b, 2008c; Anastasiadou, 2012a) (Table 1).

5. Motivation (e.g. Knowledge related to Bid Data systems is beneficent in future carriers). Motivation is the conceptual construct that examines students' perceptions about motives regarding learnings Analytics tools, AI algorithms and Big Data systems. These motives are both intrinsic and extrinsic (Table 1).

6. Ethical issues (e.g. Analytics raise concerns regarding privacy issues). Ethical issues is the conceptual construct that examines students' perceptions about issues related to privacy violation, transparency, etc. (Howe III & Elenberg, 2020) (Table 1).

Table 1: Scale of SATBDAAIA

Conceptual Construct	Scale of SATBDAAIA
	Item
Difficulty	
	There is a great deal of complexity in many AI algorithms
	There are many algorithms that can solve the same problem and the difficulty is which one is more efficient
	There is different implement for different programming languages
	Big data systems are difficult to use
	Big data systems require advance knowledge in analytics
	Big data systems require advance programming skills
	Big data systems require advance knowledge in AI
	There is strong need for deep knowledge in mathematics for algorithms analysis
Cognitive Competence	
	I can learn Analytics easily
	I find it easy to program in AI
	I do not make errors in programming regarding AI applications
	I understand AI algorithms
	I can appreciate the way Analytics tools are used
Affective	
	I enjoy taking AI lessons
	I am interested in working in the AI field
	I like programming relate to AI
	I have fun working with Big data systems
	Due to gamification, learning can also be modified to be fun
	I am not afraid the AI revolution
	I am not feeling insecure that AI applications replace human intelligence
Value	
	Big data systems are important for decision making
	Big data systems reduce cost for business processes
	Big data systems are important in customers service
	Big data applications are important in data analysis
	Big data systems have benefits in medicine

	AI is valuable
	AI is worth studying
	The evidence of the practical benefits of Big Data is not rarely.
	AI is related to everyday life
	Contemporary jobs require deep knowledge in AI algorithms
	Big data is widely used in environmental protection including pollution monitoring, disaster warning
	Many sensors have been installed in the forest to supply environmental data for observing and disaster forecasting
	Autonomous driving or self-driving car is also very common in the field of artificial intelligence.
Motivation	
	Knowledge related to Bid Data systems is beneficent in future carriers
	Knowledge in AI makes me more employable
	Big data is used to analyze related public safety data
	Programming efficient AI algorithms allow to be part of a global business and to belong to international networks
	I appreciated the role of learning analytics
	Learning of big data is beneficent in future carriers
	I study Analytics hard because I enjoy being good at it
	I want to study Analytics because I enjoy learning about the topic
Ethical issues	
	Analytics raise concerns regarding privacy issues
	There are issues of transparency
	Individuals' autonomy is easily be disregarded regarding Big Data research
	There are significant ethical concerns related to racism and human right issues
	Big Data research requires access to large scale amounts of individual information
	Big Data research requires an inform consent decision regarding participation

4.Profiles of the respondents

The demographic profiles include the following characteristics of the despondences' gender, age and year of education. The demographic profiles shown in Table 3 is based on frequency and relative frequency distributions. The sample comprised of 177 interviewees of whom 121 (68.4%) were men and 56 (31.6%) were women. With respect to the ages of participants, 12 (6.8%) of them were 18 years old, 40 (22.6%) of them were 19 years old, 82 (46.3%) of them were 20 years old, 21 (11.9%) of them were 21 years old and, finally, 22 (12.4%) were 22 years or more. With respect to their year of studies, 22 (12.4%) of them were during their first year of their studies, 32 (18.1%) of them were during the second year, 80 (45.2%) of them were during the third year, 37 (20.9%) of them were during the fourth year and 6 (3.4%) of them were during the fifth year and above (Table 2).

Table 2: Demographic data of the sample (N = 177)

Variables	Classes	N=177	%
Gender	Male	121	68.4
	Female	56	31.6
Age	18 years	12	6.8
	19 years	40	22.6
	20 years	82	46.3
	21 years	21	11.9
	22 years or more	22	12.4
Year of Studies	First year	22	12.4
	Second year	32	18.1
	Third year	80	45.2
	Fourth year	37	20.9
	Fifth year	6	3.4

5. Results

Below (Table 3) the results related reliability of the instruments and its conceptual constructs are presented. The reliability of the instrument was related to items 1 to 46 was estimated by Cronbach alpha coefficient (a) (Croanbach, 1984).

The Cronbach' alpha coefficient is calculated to measure the reliability of the six conceptual constructs, i.e. Difficulty, Cognitive Competence, Affective, Value, Motivation and Ethical issues (Table 2). Cronbach' alpha coefficient equals to 0.900 verified the reliability of the Scale of Students' attitudes towards learning Big Data, analytics and AI algorithms. In SATBDAAIA additions Cronbach' alpha coefficient was above the cutoff point of 0.70 for all the dimensions of SATBDAAIA Scale (Students' attitudes towards learning Big Data, analytics and AI algorithms) (Anastasiadou, et al., 2014b; Anastasiadou et al., 2016a; Anastasiadou et al., 2016b; Anastasiadou & Giossi, 2018a, 2018b; Anastasiadou & Karakos, 2011; Anastasiadou, 2014; Anastasiadou, 2016; Anastasiadou, 2018a, 2018b, 2018c, 2018d) (Table 3).

The value of Cronbach's α coefficient for this instrument was equal to 0.900 and it is a very high value in terms of internal consistency (Anastasiadis, 2020; Anastasiadis & Christoforidis, 2019; Anastasiadou, 2006; Anastasiadou, 2007c; Anastasiadou, 2008d; Anastasiadou, 2009c; Anastasiadou et al., 2010b; Anastasiadou, 2011; Anastasiadou, 2012a, 2012b, 2012c, 2012d, 2012e, 2012f) (Table 3).

The value of Cronbach's α coefficient for Difficult conceptual construct was equal to 0.804 and it is a very high value in terms of internal consistency (Anastasiadou & Anastasiadis, 2011; Anastasiadou & Anastasiadis, 2019; Anastasiadou, et al., 2010a; Anastasiadou, et al., 2010b; Anastasiadou, et al., 2013) (Table 3).

The value of Cronbach's α coefficient for Cognitive Competence conceptual construct was equal to 0.788 and it is a very high value in terms of internal consistency (Anastasiadou & Pappa, 2009; Anastasiadou & Pappa, 2019; Anastasiadou & Taraza, 2020a; Anastasiadou & Taraza, 2020b; Anastasiadou & Tiliakou, 2014, 2015, 2016a, 2016b) (Table 3).

The value of Cronbach's α coefficient for Affective conceptual construct was equal to 0.836 and it is a very high value in terms of internal consistency (Panistides & Anastasiadou, 2015; Patrali et al., 2012; Souravlas & Anastasiadou, 2020; Souravlas, et al., 2020; Thapa et al., 2016; Theodoridou, et al., 2014) (Table 3).

The value of Cronbach's α coefficient for Value conceptual construct was equal to 0.874 and it is a very high value in terms of internal consistency (Anastasiadou et al., 2013; Cohen, et al., 1988; Florou, et al., 2015; Fotiadis & Anastasiadou, 2018a,2018b; Florou & Anastasiadou 2013; Kapetanopoulou et al., 2021; Kofou, & Anastasiadou, 2013; Ntotsi, & Anastasiadou, 2019a, 2019b) (Table 3).

The value of Cronbach's α coefficient for Motivation conceptual construct was equal to 0.744 and it is a very high value in terms of internal consistency (Anastasiadou et al., 2014; Anastasiadou & Draganis, 2014) (Anastasiadou, 2013a,2013b,2013c, 2013d; Anastasiadou, Florou, 2013; Batiou & Anastasiadou, 2015) (Table 3).

The value of Cronbach's α coefficient for Motivation conceptual construct was equal to 0.772 and it is a very high value in terms of internal consistency (Anastasiadou, et al., 2014a; Anastasiadou & Kofou, 2013a, 2013b; Anastasiadou & Loukas, 2009; Anastasiadou & Panitsides, 2014; Anastasiadou et al., 2015; Papademetriou et al., 2022) (Table 3).

Table 3: **Cronbach's Alpha**

Dimensions	Cronbach's Alpha
Difficulty	0.804
Cognitive Competence	0.788
Affective	0.836
Value	0.874
Motivation	0.744
Ethical issues	0.772

The following table presents the mean value (M) and the standard Deviation (SD) of each item and each conceptual construct of SATBDAAIA scale (Table 4). Among the dimensions, the highest mean level of perceptions was 4.1798 (SD=0.56548) for Difficulty conceptual construct and 4.1782 (SD=0.53546) for Ethical issues conceptual construct and the lowest mean level was 3.1222 (0.87022) for Cognitive Competence conceptual construct (Table 4).

Table 4: SATBDAAIA Scale

	SATBDAAIA Scale	Cronbach's Alpha	M	SD
Conceptual Construct	**Item**	**0.804**	**4.1798**	**56548**
Difficulty	There is a great deal of complexity in many AI algorithms		4.39	.759
	There are many algorithms that can solve the same problem and the difficulty is which one is more efficient		4.45	.732
	There is different implement for different programming languages		4.47	.773
	Big data systems are difficult to use		4.23	.782
	Big data systems require advance knowledge in analytics		3.98	.967
	Big data systems require advance programming skills		4.38	.833
	Big data systems require advance knowledge in AI		4.35	.868
	There is strong need for deep knowledge in mathematics for algorithms analysis		3.18	1.165
Cognitive Competence		**0.788**	**3.1222**	**.87022**
	I can learn Analytics easily		2.68	1.357
	I find it easy to program in AI		2.84	1.222
	I do not make errors in programming regarding AI applications		3.55	1.049
	I understand AI algorithms		3.25	1.044
	I can appreciate the way Analytics tools are used		3.29	1.218

Affective		0.836	**3.5897**	**.75263**
	I enjoy taking AI lessons		3.30	1.131
	I am interested in working in the AI field		3.47	1.144
	I like programming relate to AI		3.16	1.019
	I have fun working with Big data systems		3.99	1.101
	Due to gamification, learning can also be modified to be fun		4.04	.924
	I am not afraid the AI revolution		3.50	1.078
	I am not feeling insecure that AI applications replace human intelligence		3.67	1.001
Value			**3,8693**	**,62663**
	Big data systems are important for decision making		4.11	.943
	Big data systems reduce cost for business processes		3.55	1,095
	Big data systems are important in customers service		3.82	1,109
	Big data applications are important in data analysis		3.97	.938
	Big data systems have benefits in medicine		4.46	.913
	AI is valuable		4.51	.898
	AI is worth studying		4.22	1.003
	The evidence of the practical benefits of Big Data is not rarely.		3.65	1.040
	AI is related to everyday life		3.27	1.057
	Contemporary jobs require deep knowledge in AI algorithms		3.94	.912
	Big data is widely used in environmental protection including pollution monitoring, disaster warning.		3.44	.990
	Many sensors have been installed in the forest to supply environmental data for observing and disaster forecasting.		3.46	1.064
	Autonomous driving or self-driving car is also very common in the field of artificial intelligence.		3.91	.910
Motivation		0.744	**3.7635**	**.60113**
	Knowledge related to Bid Data systems is beneficent in future carriers		3.84	.864
	Knowledge in AI makes me more employable		4.09	1.133
	Big data is used to analyze related public safety data		3.73	1.130
	Programming efficient AI algorithms allow to be part of a global business and to belong to international networks		3.91	1.095
	I appreciated the role of learning analytics		3.81	.963
	Learning of big data is beneficent in future carriers		4.29	.807
	I study Analytics hard because I enjoy being good at it		3.28	1.136
	I want to study Analytics because I enjoy learning about the topic		3.16	1.150

Ethical issues		0.772	4.1782	.53546
	Analytics raise concerns regarding privacy issues		4.28	.817
	There are issues of transparency		4.29	.860
	Individuals' autonomy is easily be disregarded regarding Big Data research		4.10	.802
	There are significant ethical concerns related to racism and human right issues		3.94	.947
	Big Data research requires access to large scale amounts of individual information		4.27	.866
	Big Data research requires an inform consent decision regarding participation		4.20	.839
Model Fit	x2/df=1.88 CFI=0.95, GFI=0.93, RMSEA=0.04, AGFI=0.90, IFI=0.95			

The following table, Table 5, presents the intercorrelations across the six conceptual constructs used in this study plus an item measures the attitude toward Learning Big Data, Analytics and AI algorithms. An assessment of the bivariate correlations indicates that all the correlations are significant and are in the expected direction. The strongest correlation was between the conceptual constructs Difficulty and Ethical Issues (r=0.855, p<0.001). The second strongest correlation was between the conceptual constructs Affective and Value (r=0.760, p<0.01) whereas the third strongest correlation was between the conceptual constructs Value and Motivation (r=0.699, p<0.01) following by the correlation between the conceptual constructs Difficulty and Cognitive Competence, (r=0.595, p<0.01) following by the correlation between the conceptual constructs Difficulty and Value (r=0.593, p<0.01) and by the correlation between the conceptual constructs Affective, and Motivation (r=0.590, p<0.01). Equally statistically significant were the correlations between the conceptual constructs Cognitive Competence and Affective, (r=0.563, p<0.01), between the conceptual constructs Motivation and Difficulty (r=0.551, p<0.01), between the conceptual constructs Value and Cognitive Competence (r=0.543, p<0.01), between the conceptual constructs Value and Ethical Issues (r=0.493, p<0.01), between the conceptual constructs Difficulty and Affective (r=0.491, p<0.01), between the conceptual constructs Cognitive Competence and Motivation (r=0.478, p<0.01), between the conceptual constructs Motivation and Ethical Issues (r=0.466, p<0.01), between the conceptual constructs Cognitive Competence and Ethical Issues (r=0.424, p<0.01) and between the conceptual constructs Affective and Ethical Issues (r=0.371, p<0.01) (Table 5).

As far as the correlations between Difficulty, Cognitive Competence, Affective, Value and Motivation, Ethical Issues conceptual constructs and the Total score related to Students' attitudes towards Learning Big Data, Analytics and AI algorithms concerns that correlation analysis revealed significant correlations at a significant level of 99%. More specifically, the strongest correlation was between the conceptual construct Value and Total score related to Students' attitudes towards Learning Big Data, Analytics and AI algorithms (r=0.933, p<0.01), the second strongest correlation was between the conceptual construct Affective and Total score related to Students' attitudes towards Learning Big Data, Analytics and AI algorithms (r=0.857, p<0.01), whereas the third strongest correlation was between the conceptual construct Motivation and Total score related to Students' attitudes towards Learning Big Data, Analytics and AI algorithms (r=0.815, p<0.01) (Table 5).

Equally statistically significant were the correlations between the conceptual construct Difficulty and Total score related to Students' attitudes towards Learning Big Data, Analytics and AI algorithms (r=0.734, p<0.01), between the conceptual construct Cognitive Competence and Total score related to Students' attitudes towards Learning Big Data, Analytics and AI algorithms (r=0.696, p<0.01) and between the conceptual construct Ethical Issues and Total score related to Students' attitudes towards Learning Big Data, Analytics and AI algorithms (r=0.599, p<0.01) (Table 5).

Table 5: Correlation Estimates

Correlations

		DIFF	COGNIT	AFFECTIVE	VALUE	MOTIV	ETHICAL_T	Total_Attitude	Gender
DIFF	Pearson Correlation	1							
COGNIT	Pearson Correlation	,595**	1						
AFFECTIVE	Pearson Correlation	,491**	,563**	1					
VALUE	Pearson Correlation	,593**	,543**	,760**	1				
MOTIV	Pearson Correlation	,551**	,478**	,590**	,699**	1			
ETHICAL_T	Pearson Correlation	,855**	,424**	,371**	,493**	,466**	1		
Total Attitude	Pearson Correlation	,734**	,696**	,857**	,933**	,815**	,599**	1	
Gender	Pearson Correlation	,088	,023	,053	,043	,001	,096	,011	1

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

In addition, the eight hypothesized effects were supported (Table 6). Thus, it is evident that the conceptual constructs Difficulty, Cognitive Competence, Affective, Value and Motivation, Ethical issues have a positive effect on Total score related to Greek Students' attitudes towards Learning Big Data, Analytics and AI algorithms.

Table 6: Hypotheses Testing

Hypotheses	Standardized estimates	p-value	Results
Ho1: Difficulty has a strong effect on General attitude towards learning Big Data, analytics and AI algorithms	.40	<0.001	Supported
Ho2: Cognitive Competence has a strong effect General attitude towards on learning Big Data, analytics and AI algorithms	.51	<0.001	Supported
Ho3: Affective has a strong effect General attitude towards on learning Big Data, analytics and AI algorithms	.53	<0.001	Supported
Ho4: Value has a strong effect on General attitude towards learning Big Data, analytics and AI algorithms	.48	<0.001	Supported
Ho5: Motivation has strong effect on General attitude towards learning Big Data, analytics and AI algorithms	.39	<0.001	Supported
Ho6: Ethical issues has a strong effect on General attitude towards learning Big Data, analytics and AI algorithms	.36	<0.001	Supported
Ho7: Creative has a strong effect on General attitude towards learning Big Data, analytics and AI algorithms	.29	<0.001	Supported
Ho8: Gender influences General attitude towards learning Big Data, analytics and AI algorithms	.68	>0.05	Not Supported

6. Conclusions

The objective of current study is to evaluate Greek Students' attitudes towards Learning Big Data, Analytics and AI algorithms. The structural equation model verified the measurement model fit regarding the observed data (Model Fit x2/df=1.88 CFI=0.95, GFI=0.93, RMSEA=0.04, AGFI=0.90, IFI=0.95) ((Churchill, 1979; Cohen, et al., 1988; Fornell & Larcker, 1981; Chin, 1998; Kim, et al., 2008). Spector, 1992; Wixon, & Watson, 2001). Therefore, the conceptualized model that describes of Greek students' attitudes towards Learning Big Data, Analytics and AI algorithms. The model revealed students' attitudes towards Learning Big Data, Analytics and AI algorithms consist of conceptual constructs named Difficulty Cognitive Competence Affective Value Motivation Ethical Issues.

The strongest correlation was between the conceptual construct named Value and Total attitude towards Learning Big Data, Analytics and AI algorithms, the second one was between the conceptual construct named Affection and Total attitude towards Learning Big Data, Analytics and AI algorithms and the third one was between the conceptual construct named Motivation and Total attitude towards Learning Big Data, Analytics and AI algorithms. In addition, the study made it evidence that the strongest correlation was between the conceptual constructs was between Difficulty and Ethical Issues, the second strongest one was between Affective and Value whereas the third strongest one was between Motivation and Value. These results proved that students' perceptions about the usefulness of Analytics tools, AI algorithms and Big Data systems both in professional life and everyday life influence people, motivate their willing for learning and appreciating analytics. The results also madeevidence that there was no statistically significant relation between the gender and students' attitudes towards Learning Big Data, Analytics and AI algorithms.

Still a lot of empirical research need to be done regarding students' attitudes towards Learning Big Data, Analytics and AI algorithms. Academics should and must pay attention to crucial ethical issues.

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