# TAKING BUSINESS INTELLIGENCE TO BUSINESS EDUCATION CURRICULUM: GRADUATE STUDENTS' CONCERNS

## Philip Siaw KISSI[1], Muesser NAT[2], Adeleye IDOWU[3]

*Management Information Systems, School of Applied Sciences, Cyprus International University, Nicosia, Northern Cyprus, Mersin 10, Turkey*
*E-mails: [1]philip.asakomah@yahoo.com (corresponding author);*
*[2]mnat@ciu.edu.tr; [3]richarddw6@ gmail.com*

**Abstract.** Business intelligence systems are widely employed in industries. However, students concerns about Business Intelligence course are largely missed in the business education curriculum. To take a proper decision on Business intelligence integration in business education, it is important to understand students' concerns. This study employed a survey questionnaire to investigate 142 graduate students concerns about integrating business intelligence into business education curriculum. The survey questionnaire was adopted from previous studies to measure students' concerns on a Business Intelligence job opportunity, interest and relevance in the Business intelligence education. The survey items have a reliability scales of Cronbach's alpha ($\alpha$) = 0.818, factor loading > 0.5, and Average Variance Extracted (AVE) $\geq$ 0.5, and Composite Reliability (CR) $\geq$ 0.6. Descriptive statistics and Independent sample t-test and Analysis of Variance (ANOVA) test were performed on the survey data. Students revealed that Business intelligence knowledge is relevant (mean = 4.29, SD = 0.710), has several job opportunities (mean = 4.16, SD = 0.675), and should be integrated into business education curriculum (mean = 3.95.08, SD = 0.79). In addition, there was no statistically significant difference (t (140) = –0.027, p > 0.05) between the concerns of students with Business Intelligence lecture experience and those without. Further, perceived importance and job opportunity significantly, F = 24.601 and p = .000(< .05) relates to the Business intelligence integration in Business Education. The findings draw implications for university management and business institutions in updating curriculum so as to equip business students with the essential Business Intelligence knowledge and skills for the betterment of the business organizations.

**Keywords:** business intelligence, course, students' concerns; business education, curriculum.

**JEL Classification:** L86, M10, I21.

## 1. Introduction

In recent times, Business intelligence systems have become progressively prominent and essential areas in information technology (Mrdalj 2011). The systems involve several methodologies, applications, and technologies, and best practices that improve the analyzing of information to make a timely business decision that lead to enhancement (Chen *et al*. 2012; Foshay *et al*. 2014; Kasemsap 2017). Business intelligence knowledge delivers require working skills, tools, and techniques to enhance business operations (Wixom *et al.* 2011). In addition, the knowledge provides relevant insight on how to solve business challenges faster for better competitive advantage (Turban *et al*. 2008). In support, Mrdalj (2007) explained that knowledge of Business Intelligence may enable students to answer the following contemporary business challenges questions such as which:

1. Customers are contributing to the profit of the organization
2. Assortments of products produce profits rather than a reduction of sales.
3. Services are the best profitable way to retain customers in the organization

Despite the above benefits for the students, many universities have still not integrated Business Intelligence course in their business education curriculum which Universities in North Cyprus are not different. This has resulted in a lack of experts in Business Intelligence (Andoh-Baidoo *et al.* 2014). The situation is likely to continue (Manyika *et al*. 2011). To ensure proper decision about Business intelligence integration in business education, it is important to understand students' concerns (Jagersma, Parsons 2011; Ngussa, Makewa 2014; Lu *et al*. 2015). However, there is no such research in this regard. It was this consideration which prompted this study which investigated graduate students' concerns about taking Business Intelligence course to business education curriculum.

The study aimed to investigate graduate students' concerns about integrating Business Intelligence course in the business education curriculum. This study sought to:

4. Investigate the level of graduate students' concerns about the relevance of Business Intelligence knowledge and its job opportunity of learning Business intelligence.
5. Examine graduate students' concerns about integrating Business Intelligence course in the business education curriculum?
6. Determine whether graduate students Business Intelligence classroom experience has an influence on their concerns about integrating Business Intelligence course in the business education curriculum.
7. Find out the extent to which students perceived Business intelligence personal knowledge and job opportunity relate to Business Intelligence integration in the Business curriculum.

The following research questions guided the study: (1) What is the level of graduate students' concerns with regards to the relevance of Business Intelligence knowledge and job opportunity of learning Business intelligence? (2) What are graduate students' concerns about integrating Business Intelligence course in the business education curricu-

lum? (3) Are there differences between the MBA and MIS graduate students' concern about integrating Business Intelligence course in the business education curriculum? (4) To what extent do students perceive the relevance of Business Intelligence knowledge and job opportunity relate individually to perceived integration of Business Intelligence in business education curriculum?

*Null Hypotheses were formulated:*

H1: There is no significant difference between the MBA and MIS students' concerns about integrating Business Intelligence course in the business education curriculum?

H2: perceived relevant of Business Intelligence knowledge and job opportunity do not relate individually to perceive integration of Business Intelligence in the business education curriculum following research questions guided the study.

The study offers graduate students, especially those majoring in business the opportunity to voice their concerns and views regarding Business Intelligence course integration in their program. Furthermore, findings draw implications for university management and business institutions in updating curriculum so as to equip business students with the essential Business Intelligence knowledge and skills for the betterment of the business organizations.

## 2. Literature review

According to Barone *et al*. (2010), students learning Business intelligence are the future executives, middle level, and operational managers. Knowledge acquired in Business Intelligence course would enable them to make strategic planning, acquire management and operational control skills as indicated in Figure 1.

They stressed that these benefits would enable students to answer related business organization questions such as "what is the best that can happen", "what exactly is the problem", "what actions are needed". There have been several studies related to the
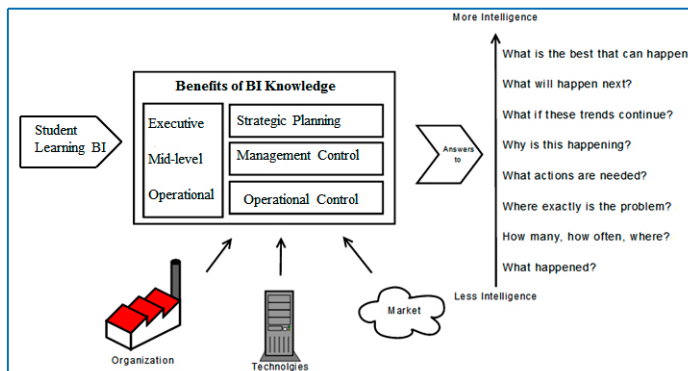


Fig. 1. The business intelligence (BI) model (adopted from Barone *et al.* 2010)

Business Intelligence education. Davis and Woratschek (2015) investigated the various Business Intelligence system and analytical tools that are used for university students in information system department and then recommended some Business intelligence software for their curriculum. Coleen and Ceyhun (2015) suggested skills and knowledge required for successful graduate students in business school. Gupta and Raja (2015) in their study recommended material and methods that can best prepare students for business organizational demands. Mitri and Palocsay (2015) presented the current state of Business Intelligence education, compared its curricula and stressed the need of Business Intelligence specialized for industries. Wang (2015) reviewed studies on Business intelligence education from the academic and practical viewpoint and presented the basis for future research. Sircar (2009) identified some reasons for the lack of Business intelligence curricula in business schools. He associated it to low literacy rate among students combine with school's resistance to increase the requirement of mathematics necessary for introduction of Business intelligence learning. He further, attributes the reason to lack of academic disciplines that provide the major aspects of Business Intelligence.

To summarize, there has been limited studies on Business intelligence education. Those few studies have suggested software tools, skills and knowledge require for Business intelligence education. There are suggested reasons for the lack of Business Intelligence curriculum in business education. Those reasons include illiteracy among student and academic indiscipline in schools. However, those studies did not consider students concerns on Business intelligence course in the business curriculum. Therefore, this article aims to contribute to the body of research on Business intelligence by incorporating students' concerns integration in business education curriculum.

## 3. Research methodology

This study utilized a descriptive survey research design with both qualitative and quantitative data collection approach. The population for this study was students pursuing a master degree program related to business in North Cyprus Universities. Specifically, the target population was Business Administration (MBA) and Management Information System (MIS) students from the Cyprus International University. The students have a total population of two hundred and fourteen (214) where students offering MBA and MIS are 170 and 44 respectively.

*Sample size determination and techniques*. Sample size calculation formula for this study was adapted from Yamane (1967). Sample size (n) $\frac{N}{1+N(e)^2}$ where the sample size is n; N for population size and e is the level of precision. 95% confidence level and $e = 0.05$ were assumed. In substituting $N = 214$ and other parameters in the above formula, a minimum sample size of 140 was to be recruited for the survey.

Purposive sampling technique was used to sample one hundred and forty-two (142) students in for the study to investigate business students' perceptions on making Business Intelligence course compulsory in the business education curriculum. Purposive sampling can be employed in both qualitative and quantitative research. The technique has the quality of data gathered and ensured selection of reliable and competence study participants (Tongco 2007).

*Data collection and analysis*. In order to investigate graduate students' perceptions of integrating the business education curriculum, the study adopted the survey items from previous studies (Hogan, Li 2011; Zheng *et al.* 2014), without confirmed validity and reliability. The survey items consist of seven closed-ended items on personal interest in Business Intelligence, career association of Business intelligence, and perception of Business intelligence with additional one closed-ended item about why Business Intelligence is/not important in the business education curriculum. A 5-point Likert scale with responses ranges from "Strongly disagree" to "Strongly agree". Out of 160 questionnaires distributed, 151 were received with 9 uncompleted responses. A total of 142 valid questionnaires with sample rate (88.75%) were used for the study. SPSS version 23.0 software was used for analyses the responded survey items. Cronbach's alpha ($\alpha$) > 0.7, factor loading > 0.5, and Average Variance Extracted (AVE) $\geq$ 0.5, and Composite Reliability (CR) $\geq$ 0.6 shows a good convergent validity (Hair Jr *et al*. 2010; Chen, Phou 2013; Stylidis *et al*. 2016). A good convergent validity indicates that the survey items have measure what it intended to measure in the study (Zainudin 2015).

Table 1. Measurement of Cronbach's alpha reliability scale

| Item | Cronbach's alpha |
|---|---|
| Business intelligence is an exciting and relevant area | 0.801 |
| I am interested in learning more about Business Intelligence | 0.786 |
| There are plenty of Job opportunities existing in the field of Business Intelligence | 0.799 |
| Business intelligence is a fast-growing field | 0.796 |
| A business education containing Business intelligence component will add value to my education | 0.778 |
| A Business Intelligence course specialized in Business Education will add value to my degree | 0.777 |
| I am interested in enrolling in a Business Education Business intelligence track if it is available. | 0.818 |
| Overall Cronbach's alpha | 0.818 |

As shown in Table 1, Cronbach's alpha reliability scale for each survey item and all items (α > 0.7) are acceptable (Nunnally 1978). This indicates the high internal consistency of the survey items (Streiner 2003). Table 2, summarizes the factor loadings, composite reliability and average variance extracted of the measures of three factors dimensions: business intelligence important, business intelligence job opportunity, and business intelligence integration. All the measures confirm the accepted levels of convergent validity, with the average variance extracted ranges from 0.50 to 0.63 and the composite reliability ranges from 0.67 to 0.84.

Table 2. Measurement summary scales using factor analysis

| Item | Measurement | Factor Loading 1 | 2 |
|---|---|---|---|
| Business Intelligence important | AVR = 0.502, CR = 0.668, Cronbach alpha (α) = 0.689 | | |
| BI1 | Business intelligence is an exciting and relevant area | 0.745 | |
| BI2 | I am interested in learning more about Business Intelligence | 0.670 | |
| Job opportunities | AVR = 0.589, CR = 0.741, Cronbach alpha (α) = 0.722 | | |
| JO1 | There are plenty of Job opportunities existing in the field of Business Intelligence | 0.824 | |
| JO2 | Business intelligence is a fast-growing field | 0.707 | |
| Business Intelligence integration | AVR = 0.634, CR = 0.838, Cronbach alpha (α) = 0.776 | | |
| BII1 | A business education containing Business intelligence component will add value to my education | | 0.755 |
| BII2 | A Business Intelligence course specialized in Business Education will add value to my degree | | 0.750 |
| BII3 | I am interested in enrolling in a Business Education Business intelligence track if it is available | | 0.878 |

Extraction method: principal component analysis. Rotation method: Varimax with Kaiser normalization.
*Note*: Loadings < .40 are omitted

## 4. Result and findings

Out of the 142 students, 31.7% (45) of them were females with the rest 68.3 % (97) male. The female students involved in the study were fewer than their male counterparts because there was a relatively fewer number of female master's students in both departments. Further, 72.5 % (103) of them were MBA students and the remaining 27.5% (39) in MIS. The MBA students were more than MIS collages since the number of master's students in MBA are comparatively larger than MIS students. Addition, 113 (79.6 %) have some knowledge and the rest do not have any knowledge in Business Intelligence. Detailed information is presented in Table 3.

Table 3. Gender distribution, departmental proportion, and knowledge

| Variable | N (%) | Total |
|---|---|---|
| Gender | Female, 45 (31.7) and Male, 97 (68.3) | 142 |
| Department | MBA, 103 (72.5) and MIS, 39 (27.5) | 142 |
| Knowledge | Yes, 113 (79.6) and No, 29 (20.4) | 142 |

*Research Question 1: What are graduates' students' concerns with regards to relevant of Business Intelligence knowledge and job opportunity of learning Business intelligence?* Descriptive statistics were used to determine mean scores, standard deviations, frequencies and percentages which were used for the analysis. In the analysis, "strongly disagree" and "disagree" were categorized as "disagree" while "strongly agree" and "agree" were categorized as "agree".

Table 4. The relevance of business intelligence

| Item | A n (%) | N n (%) | D n (%) | M | SD |
|---|---|---|---|---|---|
| 1. Business intelligence is an exciting and relevant area | 117 (82.6) | 23 (16.2) | 2 (1.4) | 4.26 | 0.856 |
| 2. I am interested in learning more about Business intelligence | 122 (85.9) | 18 (12.7) | 2 (1.4) | 4.30 | 0.790 |

*Note*: D = Disagree, N = Neutral, A = Agree, M = Mean, and SD = Standard deviation

As shown in Table 4, most graduate students 117 (82.6%) indicate that Business Intelligence is an exciting and relevant course (item 1), only 2 (1.4) disagree. Also, 122 (85.9%) of them expressed interest in learning more about Business Intelligence (item 2). Again, the mean scores range from 4.28 (0.856) to 4.30 (0.790). This signifies that all the items are agreed by the graduate students. The finding shows that the students understand Business Intelligence as relevant and an interesting field of study to support industries. In the agreement, Business Intelligence is an important part of businesses solution by providing vital decision-making information to build shareholder value and to ensure permanency (Dawson, Van Belle 2013; Foshay, Kuziemsky 2014; Brooks *et al*. 2015).

Table 5. Job opportunity

| Item | A n (%) | N n (%) | D n (%) | M | SD |
|---|---|---|---|---|---|
| 3. There are plenty of Job opportunities existing in the field of Business Intelligence | 105 (73.9) | 35 (24.6) | 2 (1.4) | 4.06 | 0.797 |
| 4. Business intelligence is a fast growing field | 115 (81.0) | 26 (18.3) | 1 (0.7) | 4.11 | 0.716 |

In Table 5, the vast majority of the students 105 (73.9%) agreed that there are plenty of Job opportunities existing in the field of Business Intelligence, just 2 (1.4%) of them disagreed (item 3). Further, most of the students 115 (81.0%) approved that Business intelligence is a fast-growing prominence field, only 1 (0.7%) of the students disagreed (item 4). Addition, the mean score ranges from 4.09 (SD = 0.797) to 4.11 (SD = 0.716). This result suggests that the students recognize Business intelligence as fast growing area creating more job opportunity for Business Intelligence experts. In support, Wixom *et al.* (2014) affirmed the needs for recruiting more Business Intelligence qualified employees in the future, predicting an increasing number of 89 percent. Addition, they confirm that the students are aware of the growth of Business Intelligence and their confidence in the availability of job opportunities Business intelligence have increased.

*Research Question 2: What are students' concerns about integrating Business Intelligence course in the business education curriculum?* This research question sought to determine the students' concerns about integrating Business Intelligence course in the business education curriculum. The minimum and maximum frequencies of the students' responses to the survey items in Table 6 were 2 and 111 respectively and the mean scores ranged from 3.82 (SD = 1.01) to 4.08 (SD = 0.791). The majority of the students 107 (75.3%) agree that business education containing Business intelligence component will add value to their education while 2 (1.4%) of the students disagreed (item 5). Further, a high number of the students 111 (78.3%) agree that Business intelligence course specialized in Business Education will add value to their disagreed while 9 (6.3%) disagreed (item 6). In addition, most students 93 (65.5%) shown interest in enrolling business education curriculum with Business Intelligence (item 7), only 16 (11.3%) indicated disliked.

Table 6. Business intelligence integration in business education curriculum

| Item | A n(%) | N n(%) | D n(%) | M | SD |
|---|---|---|---|---|---|
| 5. A business education containing Business intelligence component will add value to my education | 107 (75.3) | 33 (23.2) | 2 (1.4) | 4.08 | 0.791 |
| 6. A Business intelligence course specialized in Business Education will add value to my degree | 111 (78.2) | 22 (15.5) | 9 (6.3) | 3.94 | 0.897 |
| 7. I am interested in enrolling in a Business Education Business intelligence track if it is available | 93 (65.5) | 33 (23.2) | 16 (11.3) | 3.82 | 1.008 |

Some students provided the following reasons for their disagreement or neutral for Business intelligence integration in Business Education curriculum: "Am not interested in learning Business intelligence"; "Without Business, intelligence one could still engage in business"; "Am not sure to take another course".

Some students provided the following reasons for their disagreement or neutral for Business intelligence integration in Business Education curriculum: "Am not interested in learning Business intelligence"; "Without Business intelligence one could still engage in business"; "Am not sure to take another course".

In contrast, the students also stated the following reasons for their agreement for Business intelligence integration in Business Education curriculum: "Business Intelligence is fast growing field, exciting to learn, and I will be valuable for job market with its skill"; "Business intelligence focus on providing information to business for them to have competitive advantage and as aspiring manager, I wish to enroll"; "Today many companies are using Business Intelligence in order to have competitive advantage in my field, I think improving my knowledge in Business Intelligence will help me"; "Business intelligence is important ant in business education, I can apply a lot of skills, evaluating and implementing business strategies"; "Business intelligence will widen and expand my ideas in business and management".

As indicated in Figure 2, a high percentage of the students perceive Business intelligence as fast growing and relevant area with several job opportunities. They further express their readiness to learn Business Intelligence course and enrolled if is mounted in the business education curriculum.

*Research Question 3: Are there differences between the MBA and MIS students' perceptions of integrating Business Intelligence course in the business education curriculum?* The question sought to find out whether there was any association between Business Intelligence lecture experience and students perception. A t-test was conducted to determine if there were any significant differences between the perception of MIS students (department with Business Intelligence course) and students MBA (without Business Intelligence course). To find out whether there were significant differences between the MBA and MIS students' perceptions of integrating Business Intelligence course in the business curriculum, a null hypothesis was stated and tested.

*Testing of Hypothesis.* $H_1$: There is no significant difference between the MBA and MIS students' perceptions of integrating Business Intelligence course in the business curriculum.
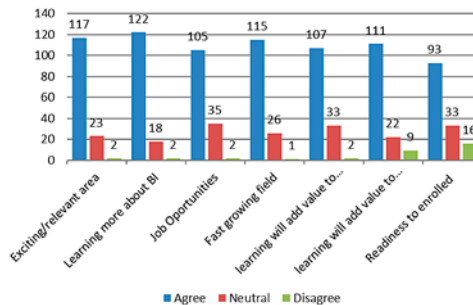


Fig. 2. Students concerns of business intelligence

The independent sample t-test was used to test the hypothesis at a p = 0.05. The results are provided in Table 7.

Table 7. T-test results on MBA and MIS students' concerns about business intelligence integration in business education curriculum

| Department | N | Mean | Standard deviation | t | Df | | sig |
|---|---|---|---|---|---|---|---|
| MBA | 103 | 3.945 | 0.720 | −.027 | 140 | 0.735 | |
| MIS | 39 | 3.948 | 0.811 | | | | |

*p > 0.05

The overall mean scores of MBA and MIS students' concerns on Business intelligence integration in business education curriculum were 3.945 (SD = 0.720) and 3.948 (SD = 0.811) respectively (Table 7). This seems to indicate that the MIS students had more positive concerns about Business intelligence integration in Business Education Curriculum than the MBA counterparts. The t-test results, however, showed that there was no statistically significant difference (t (140) = −0.027, p > 0.05) between the concerns of MBA and MIS students on Business intelligence integration in Business Education Curriculum. Thus the null hypothesis was accepted (Baldi, Long 2001). This means that students' concerns are not influenced by their previous classroom lecture experience.

*Research Question 4: To what extent do the perceived personal interest and job opportunity relate individually to perceived integration of Business Intelligence in business education curriculum?* The question sought to find out the extent for which graduates students' perceived interest in Business Intelligence and perceived job opportunity relate to their perception of Business intelligence integration in Business Education. Analysis of variance test was conducted to determine to determine the relationship of a linear combination of perceived job opportunity and perceived job opportunity with perceived integration of Business Intelligence in Business Education using the research hypothesis $H_2$.

*Testing of Hypothesis.* $H_2$: Perceived personal interest and job opportunity; do not relate individually to perceived integration of Business Intelligence in business education curriculum the business curriculum.

Table 8 shows the Analysis of Variance (ANOVA) test of statistical significance of regression model. From the ANOVA (Table 8), F = 24.601 and p = .000(<.05) which point out that the test was statistically significant. Hence, the null hypothesis ($H_2$) is rejected (Kass *et al*. 2014). This indicates that Job opportunity and personal knowledge significantly relates to the integration of Business Intelligence in the business education curriculum. Personal knowledge and job opportunity are two main factors that influence students' intention to offer Business Intelligence course.

Table 8. ANOVA test of significance

| | Model | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 20.912 | 2 | 10.456 | 24.601 | .000[b] |
| | Residual | 59.077 | 140 | .425 | | |
| | Total | 79.988 | 142 | | | |

a. Dependent variable: Business intelligence integration
b. Predictors: (constant), job opportunity, personal knowledge

The following are the main finding of the study: (1) Students perceived Business intelligence course as relevant area and ready to enroll in the course; (2) Students had positive concerns about Business intelligence and want Business intelligence course should be integrated into the business education curriculum; (3) Students' concerns were not affluence by previous Business Intelligence classroom lessons; (4) Personal knowledge and job opportunity influence students' readiness to pursue a Business Intelligence course.

This study investigated graduates' concerns about integrating Business Intelligence course in business education. It was revealed that graduate students had positive concerns about integrating Business Intelligence course in the business education curriculum. They suggested that Business Intelligence course is relevant and should be integrated into the business education curriculum. In agreement, Chen *et al.* (2012) recommended that Business intelligence is an important area that needs to be studied in order to resolve problems of modern business organizations. In support, Wixom *et al.* (2011) proposed that students specializing in business education should be taught Business intelligence course, and not only for those pursuing a degree in Business intelligence or information system engineering degree.

## 5. Conclusions

Due to the urgent need of Business Intelligence specialist in many industries globally, it is important that students persuading business education should be taught Business Intelligence course. Universities and other business colleges must introduce the business intelligence course in their curriculum. This would support the students in their future employment. For instance, the Business Intelligence skills acquire would enable them to find out: the best customers contributing to the profit of their organization, identify products that generate more profits, and the best profitable way to retain customers in the organization.

The future studies should include a survey of large sample size with an accepted number of institutions. Further, there should be empirical studies to ascertain challenges in integrating Business Intelligence course in the business education curriculum. Addition, future studies should compare faculty members and students concerns

about Business intelligence integration in the business education curriculum to ascertain whether there is a significant difference in their concerns.

The study was limited to one institution in North Cyrus. Limiting the study to only one out other universities in North Cyprus with a sample size of 142 graduate students affects the generalizability of the findings. However, the results could be generalized to the university sampled and contribute to literature.

# References

Andoh-Baidoo, F.; Villa, A.; Aguirre, Y.; Kasper, G. 2014. Business intelligence & analytics education: an exploratory study of business & non-business school IS program offerings, in *Proceedings of Americas Conference on Information Systems (AMCIS)*, 7–9 August, 2014, Savannah, Georgia, USA.

Baldi, P.; Long, A. D. 2001. A Bayesian framework for the analysis of microarray expression data: regularized t-test and statistical inferences of gene changes, *Bioinformatics* 17(6): 509–519. https://doi.org/10.1093/bioinformatics/17.6.509

Barone, D.; Mylopoulos, J.; Jiang, L.; Amyot, D. 2010. *The business intelligence model*: *strategic modelling*. University of Toronto, Canada.

Brooks, P.; El-Gayar, O.; Sarnikar, S. 2015. A framework for developing a domain specific business intelligence maturity model: application to healthcare, *International Journal of Information Management* 35(3): 337–345. https://doi.org/10.1016/j.ijinfomgt.2015.01.011

Chen, C. F.; Phou, S. 2013. A closer look at destination: image, personality, relationship, and loyalty, *Tourism management* 36: 269–278. https://doi.org/10.1016/j.tourman.2012.11.015

Chen, H.; Chiang, R. H.; Storey, V. C. 2012. Business intelligence and analytics: from big data to big impact, *MIS quarterly* 36(4): 1165–1188.

Coleen, R. W.; Ceyhun, O. O. 2015. Business analytics curriculum for undergraduate majors, *INFORMS Transactions on Education* 15(2): 180–187. https://doi.org/10.1287/ited.2014.0134

Davis, G.; Woratschek, C. R. 2015. Evaluating business intelligence / business analytics software for use in the information systems curriculum, *Information Systems Education Journal* 13(1): 23–29.

Dawson, L.; Van Belle, J. P. 2013. Critical success factors for business intelligence in the South African financial services sector: original research, *South African Journal of Information Management* 15(1): 1–12. https://doi.org/10.4102/sajim.v15i1.545

Foshay, N.; Kuziemsky, C. 2014. Towards an implementation framework for business intelligence in healthcare, *International Journal of Information Management* 34(1): 20–27. https://doi.org/10.1016/j.ijinfomgt.2013.09.003

Foshay, N.; Taylor, A.; Mukherjee, A. 2014. Winning the hearts and minds of business intelligence users: the role of metadata, *Information Systems Management* 31(2): 167–180. https://doi.org/10.1080/10580530.2014.890444

Gupta, B.; Raja, U. 2015. Teaching analytics, decision support, and business intelligence: challenges and trends, in S. I. Lakshmi & J. P. Daniel (Eds.). Reshaping society through analytics, collaboration, and decision support, *Annals of Information Systems* 18: 205–209. https://doi.org/10.1007/978–3–319–11575–7_14

Hair Jr, J. F.; Black, W. C.; Babin, B. J.; Anderson, R. E. 2010. *Multivariate data analysis.* 7th ed. New Jersey, NJ: Pearson Prentice Hall.

Hogan, P.; Li, L. 2011. The perceptions of business students regarding management information systems (MIS) programs, *Journal of Technology Research* 2(1): 1–6.

Jagersma, J.; Parsons, J. 2011. Empowering students as active participants in curriculum design and implementation, *New Zealand Journal of Teachers' Work* 8(2): 114–121.

Kasemsap, K. 2017. Mastering business process management and business intelligence in global business, in M. Tavana, K. Szabat, K. Puranam (Eds.). *Organizational productivity and performance measurements using predictive modeling and analytics.* Hershey, PA: IGI Global, 192–212. https://doi.org/10.4018/978–1–5225–0654–6.ch010

Kass, R. E.; Eden, U. T.; Brown, E. N. 2014. Analysis of variance, in *Analysis of Neural Data*. New York, NY: Springer, 361–389. https://doi.org/10.1007/978–1–4614–9602–1_13

Lu, C. Y.; Nguyen, Q.; Ersin, O. H. 2015. Active student engagement in curriculum development, *American Journal of Pharmaceutical Education* 79(2): 30. https://doi.org/10.5688/ajpe79230

Manyika, J.; Chui, M.; Brown, B.; Bughin, J.; Dobbs, R.; Roxburgh, C.; Byers, A. H. 2011. *Big data: the next frontier for innovation, competition, and productivity*. McKinsey Global Institute, 1–13.

Mitri, M.; Palocsay, S. 2015. Toward a model undergraduate curriculum for the emerging business intelligence and analytics discipline, *Communications of the Association for Information Systems* 37: 651–669.

Mrdalj, S. 2011. Would cloud computing revolutionize teaching business intelligence courses, *Issues in Informing Science and Information Technology* 8: 209–217.

Mrdalj, S. 2007. Teaching an applied business intelligence course, *Issues in Information Systems* 8(1): 134–138.

Ngussa, B. M.; Makewa, L. N. 2014. Student voice in curriculum change: a theoretical reasoning, *International Journal of Academic Research in Progressive Education and Development* 3(3): 23–37. https://doi.org/10.6007/IJARPED/v3-i3/949

Nunnally, J. C. 1978. *Psychometric Theory*. 2nd ed. New York, NY: McGraw-Hill.

Sircar, S. 2009. Business intelligence in the business curriculum, *Communications of the Association for Information Systems* 24(17): 289–302.

Streiner, D. L. 2003. Starting at the beginning: an introduction to coefficient alpha and internal consistency, *Journal of personality assessment* 80(1): 99–103. https://doi.org/10.1207/S15327752JPA8001_18

Stylidis, D.; Sit, J.; Biran, A. 2016. An exploratory study of residents' perception of place image: the case of Kavala, *Journal of Travel Research* 55(5): 659–674. https://doi.org/10.1177/0047287514563163

Tongco, M. D. C. 2007. Purposive sampling as a tool for informant selection, *Ethnobotany Research and Applications* 5: 147–158. https://doi.org/10.17348/era.5.0.147–158

Turban, E.; Sharda, R.; Aronson, J. E.; King, D. 2008. *Business intelligence: a managerial approach*. Upper Saddle River, NJ: Pearson Prentice Hall.

Wang, Y. 2015. Business intelligence and analytics education: hermeneutic literature review and future directions in IS Education, in *Proceedings of Twenty-First Americas Conference on Information Systems (AMCIS)*, 13–15 August 2015, Puerto Rico.

Wixom, B.; Ariyachandra, T.; Goul, M.; Gray, P.; Kulkarni, U; Phillips-Wren, G. 2011. The current state of business intelligence in academia, *Communications of the Association for information Systems* 29(16): 299–312.

Wixom, B.; Ariyachandra, T.; Douglas, D.; Goul, M.; Gupta, B.; Iyer, L.; Turetken, O. 2014. The current state of business intelligence in academia: the arrival of big data, *Communications of the Association for Information Systems* 34(1): 1–13.

Yamane, T. 1967. *Statistics: an introductory analysis*. 2nd ed. New York, NY: Harper and Row.

Zainudin, A. 2015. *SEM made simple*. Bangi, Selangor: MPWS Publisher.

Zheng, G.; Zhang, C.; Li, L. 2014. Bringing business intelligence to health information technology curriculum, *Journal of Information Systems Education* 25(4): 317–325.

**Philip Siaw KISSI.** M.Phil., Research assistant in the Departments of Management Information Systems and Information Technology(School of Applied Sciences) at the Cyprus International University (CIU). He is currently offering PhD in management information systems in CIU. He holds M.Phil. and M.Ed. in Mathematics Education from the University of Education (UEW). His research interests include business and mathematics education, educational technology, curriculum development and implementation, Integration of technology in a business organization.

**Muesser NAT.** PhD Assistant Professor in the Departments of Management Information Systems (Head) and Information Technology(School of Applied Sciences)at the Cyprus International University (CIU). She holds PhD in Design, Development, and Evaluation of technology-enhanced learning environment and MSc. in E- Commence Technology from the University of Greenwich and the University of Essex respectively. Her research interests include E-learning/Online learning systems, Adaptive/personalized learning, Integration of ICT and internet technologies into education, Learning styles and strategies, Design and development of learning environments, LMS (Moodle, LAMS, Blackboard, Captivate, Articulate).

**Adeleye IDOWU.** MSc., Research assistant in the Departments of Information Technology and Management Information Systems (School of Applied Sciences) at the Cyprus International University (CIU). He holds MSc. in Management Information Systems from the CIU. Research Interest: Flipped Classroom, Education Technology, Virtual reality in education, Learning Analytics, BOYD and Social media at higher education.