Business partner vs. bean counter.
Do the personality traits of accounting students
meet contemporary business requirements?

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Abstract

The accountant's role is subject to the scientific discourse as a fundamental paradigm change takes place, moving away from the traditional "bean counter" image towards a "business partner" of the management (Pickering, Byrnes, 2016; Richardson et al., 2015; Sorensen, 2009). As far back as 1981, Jacoby pointed out that the personality traits of a "bean counter" do not correspond to the requirements of the practice, e.g. strong soft skills and interdisciplinary qualities (Jacoby, 1981; Briggs et al., 2007). It can be observed that for decades, predominantly the "bean counter" type has continued to opt for a career in accounting (Briggs et al., 2007). The present study confirms the dominance of "bean counter" types in accountancy by applying the Myers-Briggs Type Indicator (MBTI) with undergraduate business students and shows that there is still no significant change observable. The analysis shows that business students are significantly more frequently extroverted, thinking, and judging than the overall population. The accounting students among them are more sensing and thinking. Specific differences can be observed between the individual majors. As a result, the talent pool for the accounting profession is more likely to have "bean counters" than "business partners".

Keywords: Myers-Briggs Type Indicator, accounting students, personality types, traits, bean counter, business partner.

Streszczenie
Partner biznesowy a „liczykrupa". Czy cechy osobowościowe studentów
rachunkowości spełniają współczesne wymagania biznesowe?

Rola księgowego podlega dyskursowi naukowemu jako fundamentalna zmiana paradygmatu, która odchodzi od tradycyjnego wizerunku „liczykrupy" w kierunku „partnera biznesowego" kierownictwa (Pickering, Byrnes, 2016; Richardson et al., 2015; Sorensen, 2009). Już w 1981 roku Jacoby wskazał, że cechy osobowości „liczykrupy" nie odpowiadają wymogom praktyki, np. silne umiejętności miękkie i cechy interdyscyplinarne (Jacoby, 1981; Briggs i in., 2007). Można zaobserwować, że przez dziesięciolecia głównie

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typ „liczykrupy" decydował się na karierę w księgowości (Briggs et al., 2007). Przeprowadzone badanie potwierdza dominację typów „liczykrupy" w księgowości w wyniku zastosowania wskaźnika typu Myers-Briggs (MBTI) w kontekście studentów biznesowych studiów licencjackich i pokazuje, że nadal nie zaobserwowano istotnej zmiany. Z analizy wynika, że studenci biznesowi są znacznie częściej ekstrawertyczni, rozumni i oceniający niż cała populacja. Studenci rachunkowości są szczególnie wrażliwi i myślący. Konkretne różnice można zaobserwować między poszczególnymi kierunkami studiów. W rezultacie pula talentów w zawodzie księgowego jest bardziej prawdopodobna w przypadku „liczykrupy" niż w przypadku „partnerów biznesowych".

Słowa kluczowe: Wskaźnik typu Myers-Briggs, studenci księgowości, typy osobowości, cechy, liczykrupa, partner biznesowy.

Introduction

The general public perception of the accounting profession gained much attention after the financial crisis in 2007 and the financial fraud scandals of, among others, Enron, WorldCom, and Parmalat (see also Briggs et al., 2007; Abdolmohammadi et al., 2009). There is a common unappealing image of accountants as being dull, rigid, methodical, greedy, and boring (Dimnik, Felton, 2006; Baldvinsdottir et al., 2009). After the "relevance lost" critique and "self-interest claims" (Kaplan, Johnson, 1987), the profession has been forced to reposition itself by improving its reputation and foster its public image.

The accountant's role is subject to the scientific discourse as a fundamental paradigm change takes place, moving away from the traditional "bean counter" image towards a more dynamic and service-oriented "business partner" (Rieg, 2018; Pickering, Byrnes, 2016; Richardson et al., 2015; Sorensen, 2009). Subsequently, it can be assumed that prospective accountants should possess more a business mindset rather than a pure attitude towards the diligent execution of accounting activities. Accordingly, from the perspective of industrial and organisational psychology, the question arises whether potential accounting candidates from modern business schools meet these new business requirements to qualify as a "business partner" or whether they still embrace the mindset of a "bean counter".

The present study analyses the current distribution of personality traits among accounting students in comparison with other business students and the overall population by using the Myers-Briggs Type Indicator (MBTI). In particular, the study aims to examine whether there is a self-selection bias – which leads to certain personality types opting for the accounting major (Abdolmohammadi et al. 2003; Rieg, 2018; Bravidor et al., 2018) – by identifying group differences between accounting and non-accounting students and between different majors in business studies.

The key findings of this study are that students of business administration, in general, show significantly more frequent extraversion, thinking, and judging preferences than the overall population. The extrovert is more outgoing and can be described as

a "socialiser" compared to other individuals. As business students more frequently show the judging type, it can be assumed that they prefer to act analytically and in a structured way. Furthermore, as business students tend to be more often the thinking type, they are, on average, more rational deciders as they link decisions to logical cognitive processes. Our data indicate that potential accounting students are more sensing and thinking than other non-accounting business students. Thus, they show higher analytical skills and higher rational thinking than other students of business administration, but they lack team-play and interpersonal skills. Furthermore, they are lacking intuition and thus creativity and "out of the box"-thinking. As a result, the talent pool for the accounting profession is more likely to have "bean counters" than "business partners". Consequently, this self-selection scheme reinforces the stereotypes of accountants, as behavioural studies found that the selection of a career could be impacted by the impression and intensity of the stereotypes towards this profession (Holland, 1973).

This study might be of interest to employers, especially recruiters of companies with an accounting department or specialised accounting firms, as it helps to understand potential accounting candidates from a personality perspective. It also enables companies to create a working environment that leads to accountants performing at their full potential, i.e. effectively and most efficiently to produce valuable work. In addition, it helps to identify which skills need to be practised due to changing job profiles and requirements.

This study is structured as follows: In section 2, the theoretical background is presented, the existing literature is reviewed, and the hypotheses for the empirical study are derived. In section 3, the applied methodology and the sample are described. In section 4, the results are presented. The paper ends with a discussion and conclusion.

1. Theoretical background, related research, and hypothesis development

1.1. Personality theory and personality traits

Research on human behaviour has evolved around behaviourism, personality theories and cognitive science (Engler, 1999). Behaviourism deals with the behavioural response to external stimuli, which neglects the internal psychological processes, while personality theories and cognitive science focus on the internal processes (Wheeler, 2001). Cognitive science and behaviourism have been widely used in accounting research, whereby personality theories are not commonly applied in the context of accountancy (Wheeler, 2001). Personality theories aim to define and comprise individual characteristics or traits (Feldman et al., 2015). These personality traits are able to explain how individuals tend to feel, think, and behave in certain situations (Feldman et al., 2015).

Jung (1933a; 1933b) was the first to introduce psychological personality types, as he believed that individuals tend to manifest certain habitual attitudes, perceptions and decision-making based on differences in mental functioning (see also Myers, 1962; Myers, Myers, 1995). Myers and Briggs operationalised Jung's theory of personality types and developed a personality assessment test, which is known as the Myers-Briggs Type Indicator (MBTI) (Myers, 1962; Jung, 1933a; Jung 1933b; Myers, Myers, 1995). Another well-known test for personality traits is the Revised NEO Personality Inventory (Costa, McCrae, 1978; Costa, McCrae, 2008). In his theory, Jung (1933) divides mental function into two broad categories: perceiving and judging. Perceiving consists of sensing (S) and intuition (N) (see also Myers, Myers, 1995). Sensing refers to direct and objective perception (see also Myers, Myers, 1995). Intuition, on the other hand, refers to indirect and subjective perception (see also Myers, Myers, 1995). Judgment can be decomposed into thinking (T) and feeling (F) (see also Myers, Myers, 1995). While thinking indicates that decisions are linked to logical cognitive processes, feeling, by contrast, refers to decision-making based on a subjective, respectively emotional conclusion (see also Myers, Myers, 1995). Furthermore, the theory considers the individual's orientation to life (see also Myers, Myers, 1995). Thus, according to the theory, individuals differ in their mental functioning based on their preference toward the world in its external and internal aspects (see also Myers, Myers, 1995). In line with their personal interests or tendencies, individuals can be categorised as extraverts (E) or introverts (I) (see also Myers, Myers, 1995). An extravert individual focuses on the external world and the social aspects (see also Myers, Myers, 1995). On the other hand, an introvert's attention is on the inner environment of his or her mind (see also Myers, Myers, 1995). In addition to Jung's typological model, Myers and Briggs modify Jung's original theory by introducing judgement (J) and perception (P) as new categories which reflects individuals' general attitude towards dealing with the external respectively outer world (Myers, Myers, 1995). Based on the described preferences of mental functioning – the four dichotomy categories – an individual's personality has eight traits to varying degrees, with some being dominant and the others being inferior (Myers, Myers, 1995). Hence, according to this framework, and based on four-letter coding (e.g. ESTP), there are 16 possible combinations of the interplay of the eight personality traits, which leads to 16 distinct personality types (see also Myers, Myers, 1995).

1.2. Prior research on personality traits in accounting

A knowledge of personality traits helps accountants to avoid the stereotypical assumption associated with the profession (Briggs et al., 2007). As Jacoby (1981) postulates, self-knowledge is the starting point to develop the desired skills which are required from the business perspective.

A significant share in the research of personality traits of accountants can be traced back to Shackleton's (1980) study of accountants. By using the abovementioned MBTI test, the author concludes that accountants can be classified as the sensing, thinking and

judging (STJ) type, i.e. they prefer factual data, and they evaluate based on logic and consistency. Other researchers focussing on accountants' personality traits demonstrate similar findings. For example, by using the MBTI, Wolk and Nikolai (1997) observed in their study with 94 accounting students and 98 accounting faculty members that both have a strong STJ preference. Consequently, the authors demand a greater diversity of personality types in attracting students. Also, the authors claim that accounting faculty members should bring greater variation to their teaching and learning methods. Both measures facilitate the ability to meet the new or changed requirements of practice. Similarly, in a five-year observation period between 1999 and 2003, Briggs et al. (2007) analysed the personality types of prospective accountants, i.e. accounting students, by using the MBTI and found a persistently high dominance of the STJ trait. Abdolmohammadi et al. (2009) analysed the personality traits of accounting graduates by using the MBTI to compare the traits of subjects from 1990 with those from 2005. The authors observed a strong and unchanged dominance of the ST preference. The authors also observed that this personality type is linked to comparably lower ethical reasoning than other personality types (see also Abdolmohammadi et al. 2003).

Swain and Olsen (2012) conducted the MBTI in a longitudinal study in 1992/1993 with 1,208 students of an accounting class. Fifteen years later, in 2008, 717 of the original participants performed the test again in their professional role. The authors were able to demonstrate that SJ types more frequently opt for accounting and remain in this profession for longer. Nourayi and Cherry (1993) observed in their empirical analysis with 103 accounting students that those with a sensing preference perform better in accounting subjects in comparison to those with an intuitive preference.

In their empirical study using the MBTI, Ott et al. (1990) found that accounting students with a sensing (S) and thinking (T) preference perform better in accounting exams if lectured traditionally in comparison to computer-based lectures. Conversely, accounting students with a strong intuitive (N) and feeling (F) preference exhibit better performance after computer-based instructions. Consequently, the authors recommended that educators should apply a wide range of teaching and learning methods to foster the strengths of different personality types. Geary and Rooney (1993) showed in their analysis that accounting students have a stronger preference for sensing (S) than other university students who tend to be intuitive (N). Based on their experiment with a hybrid of intuitive and sensate assignments, the authors were able to show that combined teaching materials that integrate both aspects enhance the cognitive thinking of accounting students. Therefore, the authors propose a paradigm shift in education and pedagogy in order to meet the needs of practitioners. Table 1 summarises the extant empirical findings of MBTI research with accounting students.

Based on a literature review, Richardson et al. (2015) developed a framework of accountant stereotypes that portrays the traditional bookkeeper and contemporary business professional image of accountants. They highlight four stereotypical images: the traditional bookkeeper image is characterised by the "scorekeeper" and "bean counter" image, while the contemporary business professional image can be decomposed into "guardian" and "entrepreneur".

Table 1. Summary of MBTI studies with accounting students

Authors	*n*	E	I	S	N	T	F	J	P
Swain and Olsen (2012)	243	49,8%	50,2%	81,5%	18,5%	53,1%	46,9%	74,1%	25,9%
Andon et al. (2010)	93	60,2%	39,8%	44,1%	55,9%	51,6%	48,4%	69,9%	30,1%
Briggs et al. (2007)	192	55,2%	44,8%	73,5%	26,5%	67,8%	32,2%	61,5%	38,5%
Ramsay et al. (2000)	132	48,5%	51,5%	72,0%	28,0%	68,9%	31,1%	62,9%	37,1%
Wolk and Nikolai (1997)	152	55,0%	45,0%	79,0%	21,0%	65,0%	35,0%	69,0%	31,0%
Landry et al. (1996)	88	52,3%	47,7%	75,0%	25,0%	65,9%	34,1%	69,3%	30,7%
Laribee (1994)	320	55,9%	44,1%	67,5%	32,5%	68,8%	31,2%	60,0%	40,0%
Booth and Winzar (1993)	490	42,7%	57,3%	68,6%	31,4%	73,7%	26,3%	66,9%	33,1%

Source: see also Kovar et al. (2003).

Traditionally, accountants have been perceived as "scorekeepers", who embrace positive attributes such as vigilance, honesty and trustworthiness (Baldvinsdottir et al., 2009; Bougen, 1994; Dimnik, Felton, 2006; Richardson et al., 2015). They are also seen as disciplined, conservative, articulate, and law-abiding citizens (Dimnik, Felton, 2006; Richardson et al., 2015). Hence, the "scorekeeper" image is publicly respected because of the positive public association. Despite the positive stereotypes of the "scorekeeper" image, the "bean counter" constitutes a negative representation (Richardson et al., 2015). The "bean counter" image supposes that accountants perform unfavourable activities (Dimnik, Felton, 2006) and they are perceived as boring, introverts, and passive (Aranya et al., 1978; Beard, 1994; Bougen, 1994; Cory, 1992; Dimnik, Felton, 2006; Smith, Briggs, 1999; Smith, Jacobs, 2011; Richardson et al., 2015).

The "guardian" image portrays the contemporary accountant as performing value-adding work, where analytical skills and critical judgement are essential (Richardson et al., 2015). Hence, the stereotype moved from an accountant that only performs tedious and boring routines to a powerful producer of valuable outcome (Richardson et al., 2015). "The efficient professional is highly respected for their versatility, communicative ability, technical competence, strong managerial skills and integrity" as Richardson et al. (2015, p. 38) explain, emphasising the positive picture of accountants. Despite the positive characteristics that have been associated with the "guardian" image, the public perception of an accountant as an "entrepreneur" came under inspection as accountants were associated with dishonest and fraudulent behaviour (Felton et al., 2008; Richardson et al., 2015). The economic crisis and various scandals led to a shift in public perception, and hence, the accounting profession suffers from a negative image (Smith,

Briggs, 1999; Richardson et al. 2015). Therefore, the "entrepreneur" image of accountants is often characterised as being unethical and cold, among others (Macintosh, 2006; Richardson et al., 2015).

The stereotypical perception of accounting has led to contemporary issues in the recruitment of accountants. Since the profession suffers from a generally negative perception, it is harder to recruit the best students due to the lack of attraction and a fear of bad association (Smith, Briggs, 1999; Dimnik, Felton, 2006). Ewing et al. (2001) point out that once a stereotype of a profession exists, it is vital to determine if it is beneficial or detrimental to that profession. As the profession is highly dependent on public image, since it gives the profession its value, it is of more importance to shed light on the stereotype and improve the perception.

1.3. Hypotheses development

This paper aims at answering the question of whether potential accounting candidates and, therefore, later accountants, have the right personality traits in order to meet the requirements of a contemporary accountant. A "bean counter" would typically show the traits of introversion (I), sensing (S), thinking (T), and judging (J) in a very pronounced manner (see Shackleton, 1980, among others). In other words, this person would have high analytical skills but lack interpersonal skills and "out of the box"-thinking. Thus, a typical "business partner" should be, on average, more extroverted (E) and intuitive (N) than a "bean counter".

In order to distinguish the group of accounting students sufficiently from other groups, in the first step, a comparison of the broad group of business students with the general population is performed. Then, in the second step, the group of business students will be further differentiated into those who opt for accounting and those who opt for another major. Due to the course of this investigation, it can be hypothesised that:

Hypothesis 1: Business students show a different distribution of psychological traits than the overall population.

Within the group of business students, there are those who opt for an accounting major and those who opt for other majors. Accordingly, it can be assumed that:

Hypothesis 2: The personality traits of accounting students differ significantly from those of non-accounting business students.

Since the group of non-accounting students is very heterogeneous, it is relevant to investigate the group differences between accounting students and the other individual major subjects. Therefore, it can be assumed that:

Hypothesis 3: There are significant contrasts between accounting students (Controlling, Financial Accounting, and Corporate Finance) and individuals from other majors (Marketing, Human Resource Management, Project Management, Tax Law, Supply Chain Management, Business Information Systems, and Business Law).

2. Methodology and sample

For this study, the MBTI in the version of Keirsey and Bates (1984) is applied on business students to reveal: (i) the different distribution of personality traits in comparison to the overall population, (ii) the different distribution of personality traits of students that want to choose an accounting major in comparison to other business students in general and (iii) those who choose specific other majors. The MBTI questionnaire consists of 70 questions that provide two possible responses for each question. The goal of the MBTI is to classify an individual into one of the 16 personality types combined out of 8 personality traits: extraversion (E) vs. introversion (I), intuition (N) vs. sensing (S), thinking (T) vs. feeling (F), and perception (P) vs. judgement (J). 10 questions are devoted to distinguishing between extraversion and introversion. Twenty questions are then devoted to each other distinction. Since this is an even numbers of questions, ambiguous type assignments are likely. The MBTI has undergone several reliability tests that provide strong support for its reliability (Wheeler, 2001). Validity analysis of the MBTI suggests that the questionnaire does not capture the personality type entirely (Hunsley et al., 2003; Wheeler, 2001). However, the test gives a strong indication of the personality type (Wheeler et al., 2004).

In order to differentiate between strong and weak occurrences of the traits, the following metrics will be applied:

$$EI\_Metrics = \frac{E - I}{E + I} \qquad (1)$$

The variable EI_Metrics differentiates between extraversion and introversion. E equals the number of questions that indicate extraversion while I equals the number of questions that indicates introversion. Accordingly, the EI_Metric shows +1 in the case of a fully extroverted individual and –1 in the case of a fully introverted individual. It shows 0 for an ambiguous result. The same calculation is performed to differentiate between all other traits, which results in the variables SN_Metrics, TF_Metrics, and JP_Metrics.

The MBTI test was conducted in the business faculty of Kiel University of Applied Science, Germany. To reflect a wide range, the test was conducted with students in the first, second, and final year of the bachelor programme in business administration. The age range of the students lies between 20 to 30 years. After misuse testing and abandoned surveys, 115 undergraduate business students answered an online questionnaire completely. No misuse and only four abandoned surveys could be detected – mainly due to technical problems with the survey system. The experiment was carried out in compulsory courses on accounting, where the entire cohort took part in the experiment. A self-selection bias induced by having selected the course, non-participation in the experiment, or similar factors can thereby be reduced to a minimum. For this reason, we assume that the sampling is completely random. The students were asked about the major they are most likely to select. The business faculty has 10 majors the students

can choose from: Controlling, Financial Accounting, Corporate Finance, Marketing, Human Resource Management, Project Management, Tax Law, Supply Chain Management, Business Information Systems, and Business Law. The majors of Controlling, Financial Accounting, and Corporate Finance will be subsumed under accounting-related majors in the course of the investigation.

To be able to compare business students with the overall population, and to compare accounting and non-accounting students, the relative frequency for every dichotomic trait category is calculated and one-proportion and two-proportion z-tests are applied to test for hypothesis 1. Due to the rather small number of observations – especially in the subsamples – we additionally apply the binomial test to underpin the results of the one-proportion z-test, and we apply the chi-square test to substantiate the results of the two-proportion z-test. In all cases, these robust tests confirm the results of the parametric tests with minor deviations of the p-values. Accordingly, we state the p-values of the standard z-tests in parenthesis.

To test hypothesis 2, based on the metrics indicated above, pairwise t-tests are performed to differentiate between accounting and non-accounting students. Further, a standard two-way ANOVA is used to test whether the traits are significantly differently distributed among the majors, controlled for gender and interaction effects. To correct for multiple pairwise comparisons, the Tukey HSD (Honest Significant Differences) is applied.

To test hypothesis 3, based on the applied ANOVA, orthogonal contrasts are investigated in order to identify the differences between accounting students and students of other individual majors.

Since the assumptions of a standard two-way ANOVA are not fully met according to the Shapiro-Wilk test for normality and the Bartlett test of homogeneity of variances, we apply a robust regression to underpin our results with reference to hypothesis 2 and hypothesis 3. Again, since this robust method confirms the results of the standard ANOVA with only minor deviations of the coefficient statistics, we disclose the results of the standard ANOVA.

3. Results

3.1. Do business students show different
psychological traits than the total population?

As shown in Table 2, 46 students, or 40.0% of all students, were most likely to opt for an accounting major, and 69 students, or 60.0%, of all students, for a non-accounting major. In total, 52 male and 63 female students were questioned, of whom 23 male (44.2%) and 23 female (36.5%) students were most likely to opt for an accounting major.

Table 2. Frequencies of business students' choice of major by gender

	Total		Male		Female	
	N	*%*	**N**	*%*	**N**	*%*
Controlling	17	14,8	8	15,4	9	14,3
Financial Accounting	13	11,3	6	11,5	7	11,1
Corporate Finance	16	13,9	9	17,3	7	11,1
Accounting	**46**	**40,0**	**23**	**44,2**	**23**	**36,5**
Marketing	16	13,9	6	11,5	10	15,9
Human Resource Mgt.	20	17,4	6	11,5	14	22,2
Project Management	11	9,6	5	9,6	6	9,5
Tax Law	8	7,0	4	7,7	4	6,3
Supply Chain Mgt.	2	1,7	1	1,9	1	1,6
Business Information Sys.	3	2,6	3	5,8	0	0,0
Business Law	9	7,8	4	7,7	5	7,9
Non-Accounting	**69**	**60,0**	**29**	**55,8**	**40**	**63,5**

Strongly deviating from other – especially Eastern European – countries, in Germany, the accounting profession is primarily male-dominated, which is reflected in the dominance of male students in the accounting majors. However, at Kiel University of Applied Sciences, this is not the case. The number of male and female accounting students is balanced. Nevertheless, the distinction is essential because the distribution of the personality traits differs significantly between the genders in the population. Accordingly, Table 3 shows the personality traits observed in our sample by gender and reflected with the average proportion of the overall population as given in the extant literature. As there are no systematic studies on the distribution of the MBTI personality traits in particular European countries, the US population is used as a proxy for the overall population in this study (CAPT, 2019). Since the test of Keirsey and Bates (1984) allows ambiguous results, the percentages of the overall population were corrected in order to make them comparable to our results. For this reason, our sample and the overall population always show the same proportion of ambiguous results.

It is obvious that the observed students at the university differ significantly from the average population, as observed by CAPT (2019). There is a highly significant difference between the proportion of extroverted students – 56.5% – and the proportion of extroverted individuals in the overall population, with a hypothesised proportion of 40.9% (p-value = 0.001). This effect is due to both male students, with 51.9% (p-value = 0.063) as well as female students, with 60.3% (p-value = 0.003). For introverts, the proportions are inverse, accordingly.

Table 3. Frequencies of MBTI-traits by gender of business students *vs.* overall population

	Total			Male			Female		
	Students (N)	Students (%)	Overall Population (%)	Students (N)	Students (%)	Overall Population (%)	Students (N)	Students (%)	Overall Population (%)
"E"	65	56,5***	40,9	27	51,9*	39,3	38	60,3****	42,1
"I"	31	27,0***	42,6	16	30,8*	43,4	15	23,8****	42,1
E-I ambiguous	19	16,5	16,5	9	17,3	17,3	10	15,9	15,9
"S"	77	67,0	61,5	37	71,2	60,6	40	63,5	63,3
"N"	24	20,9	26,3	9	17,3*	27,9	15	23,8	24,0
S-N ambiguous	14	12,2	12,2	6	11,5	11,5	8	12,7	12,7
"T"	59	51,3**	41,1	32	61,5	54,0	27	42,9****	27,6
"F"	46	40,0**	50,2	14	26,9	34,5	32	50,8**	66,0
T-F ambiguous	10	8,7	8,7	6	11,5	11,5	4	6,3	6,3
"J"	95	82,6***	57,0	41	78,8***	55,0	54	85,7****	57,5
"P"	20	17,4***	43,0	11	21,2***	45,0	9	14,3****	42,5
J-P ambiguous	0	0,0	0,0	0	0,0	0,0	0	0,0	0,0

Signif. codes: 0 '***' 0.01 '***' 0.05 '*' 0.1

The proportion of sensing students – 67.0% – does not significantly deviate from the proportion within the overall population, with a hypothesised proportion of 61.5% (p-value = 0.225). This is true for male students, with 71.2%, against 60.6% in the overall population (p-value = 0.118) and female students, with 63.5% against 63.3% in the overall population (p-value = 0.974). The proportions are inverse for intuition, accordingly.

The proportion of students with a dominant thinking trait of 51.3% significantly exceeds the hypothesised proportion of individuals with a dominant thinking trait in the overall population of 41.1% (p-value = 0.026). This effect is mainly driven by the female students, with 42.9%, against the overall population, with 27.6% (p-value = 0.007). However, the male students, with 61.5%, do not show a significant difference (p-value = 0.278) compared to the overall population with 54.0%. The gender difference in this trait in the overall population is a well-known effect (e.g. Brooks, Johnson, 1979). The proportions are inverse for feeling traits, accordingly.

The proportion of students with a dominant judging trait of 82.6% significantly exceeds the hypothesised proportion of individuals with a dominant judging trait in the overall population of 57.0% (p-value = 0.000). This effect is due to both male students, with 78.8% (p-value = 0.001), as well as female students, with 85.7% (p-value = 0.000). The proportions for perceiving traits are inverse, accordingly.

As an overall result, it can be stated that business students have a clear ESTJ preference, with extraversion (E), thinking (T) and judging (J) being found significantly more frequently than in the total population. This result is fully in line with the findings of Briggs et al. (2007).

3.2. Do accounting students show different psychological traits than other business students?

Differentiating between accounting and non-accounting students in Table 4, strong and significant differences are still observable. Although accounting students, with 52.2%, are less extroverted than other business students, with 59.4%, this effect is not significant (p-value = 0.445). In contrast, accounting students, with 82.6%, are far more sensing than other students, with 56.5% (p-value = 0.004). A weakly significant difference could be detected in thinking, where accounting students are more often dominant, with 60.9%, against the contrast group, with 44.9% (p-value = 0.093). Again, no significant difference could be observed when comparing the judging trait. Here, the accounting students are in the lead, with 89.1%, against the contrast group, with 78.3% (p-value = 0.134). The descriptives of the metric variables EI_Metrics, SN_Metrics, TF_Metrics, and JP_Metrics are displayed in Table 5, grouped by chosen major, accounting vs. non-accounting, and gender.

Table 4. Frequencies of MBTI-traits by major

	Total	Extraversion vs. Introversion						Sensing vs. Intuition						Thinking vs. Feeling						Judging vs. Perceiving					
	N	"E"	%	"I"	%	amb.	%	"S"	%	"N"	%	amb.	%	"T"	%	"F"	%	amb.	%	"J"	%	"P"	%	amb.	%
Controlling	17	14	82,4	3	17,6	0	0,0	11	64,7	4	23,5	2	11,8	9	52,9	8	47,1	0	0,0	15	88,2	2	11,8	0	0,0
Financial Accounting	13	4	30,8	4	30,8	5	38,5	13	100,0	0	0,0	0	0,0	10	76,9	2	15,4	1	7,7	13	100,0	0	0,0	0	0,0
Corporate Finance	16	6	37,5	7	43,8	3	18,8	14	87,5	2	12,5	0	0,0	9	56,3	6	37,5	1	6,3	13	81,3	3	18,8	0	0,0
Accounting	**46**	**24**	**52,2**	**14**	**30,4**	**8**	**17,4**	**38**	**82,6**	**6**	**13,0**	**2**	**4,3**	**28**	**60,9**	**16**	**34,8**	**2**	**4,3**	**41**	**89,1**	**5**	**10,9**	**0**	**0,0**
Marketing	16	8	50,0	6	37,5	2	12,5	7	43,8	7	43,8	2	12,5	4	25,0	9	56,3	3	18,8	11	68,8	5	31,3	0	0,0
Human Resource Mgt.	20	13	65,0	5	25,0	2	10,0	11	55,0	4	20,0	5	25,0	6	30,0	12	60,0	2	10,0	12	60,0	8	40,0	0	0,0
Project Management	11	7	63,6	3	27,3	1	9,1	9	81,8	1	9,1	1	9,1	10	90,9	0	0,0	1	9,1	11	100,0	0	0,0	0	0,0
Tax Law	8	5	62,5	1	12,5	2	25,0	2	25,0	4	50,0	2	25,0	2	25,0	4	50,0	2	25,0	7	87,5	1	12,5	0	0,0
Supply Chain Mgt.	2	2	100,0	0	0,0	0	0,0	2	100,0	0	0,0	0	0,0	1	50,0	1	50,0	0	0,0	2	100,0	0	0,0	0	0,0
Business Information Sys.	3	0	0,0	2	66,7	1	33,3	3	100,0	0	0,0	0	0,0	2	66,7	1	33,3	0	0,0	3	100,0	0	0,0	0	0,0
Business Law	9	6	66,7	0	0,0	3	33,3	5	55,6	2	22,2	2	22,2	6	66,7	3	33,3	0	0,0	8	88,9	1	11,1	0	0,0
Non-Accounting	**69**	**41**	**59,4**	**17**	**24,6**	**11**	**15,9**	**39**	**56,5**	**18**	**26,1**	**12**	**17,4**	**31**	**44,9**	**30**	**43,5**	**8**	**11,6**	**54**	**78,3**	**15**	**21,7**	**0**	**0,0**

Table 5. Descriptives of metric variables

Group	N	Mean	Min	Median	Max	SD	COV	Skew.	Kurtosis
EL_Metrics									
Controlling	17	0,353	-0,400	0,400	0,800	0,371	1,051	-0,893	-0,405
Financial Accounting	13	-0,062	-0,800	0,000	0,600	0,435	-7,016	-0,129	-1,129
Corporate Finance	16	0,062	-0,800	0,000	0,800	0,443	7,145	0,148	-0,842
Marketing	16	0,125	-0,400	0,100	0,800	0,406	3,248	0,122	-1,539
Human Resource Mgt.	20	0,200	-0,600	0,300	0,800	0,415	2,075	-0,468	-1,169
Project Management	11	0,327	-0,200	0,600	0,800	0,413	1,263	-0,239	-1,852
Tax Law	8	0,250	-1,000	0,400	0,800	0,602	2,408	-0,896	-0,473
Supply Chain Mgt.	2	0,600	0,200	0,600	1,000	0,566	0,943	0,000	-2,750
Business Information Sys.	3	-0,133	-0,200	-0,200	0,000	0,115	-0,865	0,385	-2,333
Business Law	9	0,422	0,000	0,400	1,000	0,367	0,870	0,073	-1,591
Non-Accounting	69	0,235	-1,000	0,200	1,000	0,432	1,838	-0,342	-0,584
Accounting	46	0,135	-0,800	0,200	0,800	0,442	3,274	-0,294	-0,894
Male	52	0,208	-0,600	0,200	1,000	0,430	2,067	0,183	-1,207
Female	63	0,184	-1,000	0,200	0,800	0,446	2,424	-0,691	-0,432
Total	115	0,195	-1,000	0,200	1,000	0,437	2,241	-0,326	-0,663
SN-Metrics									
Controlling	17	0,224	-0,400	0,200	0,800	0,349	1,558	-0,061	-1,170
Financial Accounting	13	0,331	0,100	0,300	0,700	0,175	0,529	0,426	-0,800
Corporate Finance	16	0,238	-0,500	0,300	0,700	0,307	1,290	-0,784	0,230
Marketing	16	-0,006	-0,600	0,000	0,600	0,355	-59,167	-0,002	-1,367
Human Resource Mgt.	20	0,150	-0,400	0,150	0,600	0,276	1,840	-0,071	-1,091

Table 5. (*cont.*)

Group	N	Mean	Min	Median	Max	SD	COV	Skew.	Kurtosis
Project Management	11	0,282	–0,100	0,200	0,800	0,264	0,936	0,475	–0,874
Tax Law	8	–0,125	–0,600	–0,050	0,200	0,266	–2,128	–0,523	–1,229
Supply Chain Mgt.	2	0,450	0,300	0,450	0,600	0,212	0,471	0,000	–2,750
Business Information Sys.	3	0,167	0,100	0,100	0,300	0,115	0,689	0,385	–2,333
Business Law	9	0,078	–0,600	0,100	0,700	0,346	4,436	–0,173	–0,160
Non-Accounting	69	0,103	–0,600	0,100	0,800	0,317	3,078	–0,201	–0,301
Accounting	46	0,259	–0,500	0,300	0,800	0,292	1,127	–0,517	0,078
Male	52	0,171	–0,600	0,200	0,800	0,309	1,807	–0,423	–0,075
Female	63	0,160	–0,600	0,200	0,800	0,323	2,019	–0,263	–0,404
Total	115	0,165	–0,600	0,200	0,800	0,315	1,909	–0,337	–0,220
TF_Metrics									
Controlling	17	0,041	–1,000	0,100	0,800	0,511	12,463	–0,217	–1,071
Financial Accounting	13	0,185	–0,300	0,200	0,700	0,276	1,492	0,125	–0,639
Corporate Finance	16	0,200	–0,700	0,300	0,800	0,453	2,265	–0,415	–1,156
Marketing	16	–0,194	–0,700	–0,150	0,200	0,293	–1,510	–0,147	–1,561
Human Resource Mgt.	20	–0,090	–0,900	–0,200	1,000	0,561	–6,233	0,329	–1,078
Project Management	11	0,436	0,000	0,200	1,000	0,372	0,853	0,332	–1,740
Tax Law	8	–0,125	–0,800	–0,100	0,900	0,609	–4,872	0,353	–1,469
Supply Chain Mgt.	2	–0,200	–0,600	–0,200	0,200	0,566	–2,830	0,000	–2,750
Business Information Sys.	3	0,233	–0,100	0,100	0,700	0,416	1,785	0,287	–2,333
Business Law	9	0,000	–0,800	0,100	0,700	0,559	na	–0,324	–1,730
Non-Accounting	69	–0,012	–0,900	0,000	1,000	0,509	–42,417	0,155	–0,859

Table 5. (*cont.*)

Group	N	Mean	Min	Median	Max	SD	COV	Skew.	Kurtosis
Accounting	46	0,137	−1,000	0,200	0,800	0,433	3,161	−0,422	−0,508
Male	52	0,213	−0,700	0,150	1,000	0,445	2,089	−0,177	−1,012
Female	63	−0,089	−1,000	−0,100	1,000	0,475	−5,337	0,063	−0,729
Total	115	0,048	−1,000	0,100	1,000	0,484	10,083	−0,080	−0,801
JP_Metrics									
Controlling	17	0,350	−0,789	0,368	1,000	0,434	1,240	−0,786	0,469
Financial Accounting	13	0,530	0,053	0,684	0,895	0,281	0,530	−0,661	−1,149
Corporate Finance	16	0,336	−0,368	0,474	0,684	0,366	1,089	−0,708	−0,971
Marketing	16	0,158	−0,263	0,158	0,789	0,317	2,006	0,591	−0,479
Human Resource Mgt.	20	0,269	−0,579	0,474	0,895	0,463	1,721	−0,222	−1,481
Project Management	11	0,630	0,300	0,579	0,895	0,227	0,360	−0,015	−1,819
Tax Law	8	0,224	−0,053	0,211	0,684	0,217	0,969	0,865	−0,110
Supply Chain Mgt.	2	0,789	0,789	0,789	0,789	0,000	0,000		
Business Information Sys.	3	0,474	0,158	0,579	0,684	0,279	0,589	−0,324	−2,333
Business Law	9	0,275	−0,053	0,263	0,579	0,200	0,727	−0,140	−1,307
Non-Accounting	69	0,320	−0,579	0,300	0,895	0,365	1,141	−0,176	−0,836
Accounting	46	0,396	−0,789	0,474	1,000	0,374	0,944	−0,918	0,606
Male	52	0,336	−0,368	0,368	1,000	0,365	1,086	−0,179	−0,957
Female	63	0,362	−0,789	0,368	0,895	0,375	1,036	−0,703	0,129
Total	115	0,351	−0,789	0,368	1,000	0,369	1,051	−0,479	−0,323

Our EI_Metrics for extraversion vs. introversion shows that accounting students, with a value of 0.135, are less extroverted than non-accounting students, with a value of 0.235. Although this result is not significant (p-value = 0.234), it confirms the findings of the dichotomous trait definitions above. The variable SN_Metrics shows a value of 0.259 for the accounting students and a value of 0.103 for the non-accounting students; thus accounting students are significantly more sensing than non-accounting students (p-value = 0.008), which again confirms our prior results. With a TF_Metrics of 0.137, the accounting students show that they are thinking rather than feeling. In contrast, the non-accounting students, with a value of -0.012, show more of a dominant feeling trait. The difference is weakly significant (p-value = 0.096), which is again in line with the results of the dichotomous definitions above.

In judging vs. perceiving, both groups show nearly the same mean value. Accounting students are, on average, of the judging type, with a JP_Metrics of 0.396, while non-accounting students show a value of 0.320. The difference is insignificant (p-value = 0.287), which is again in line with our prior results.

With reference to Table 1, it is now possible to compare the personality traits found for accounting students with the findings of earlier studies. With regard to the differentiation extraversion vs. introversion, the comparable studies do not show a clear picture. Of the eight studies, five point to extraversion, while three point to introversion. The results of the analysis here do not show a clear picture either. The proportion of accounting students with an extraversion of 52.2% is in the same range as the other studies. With regard to the differentiation of sensing vs. intuition, seven of the eight comparable studies show a clear result with a concise tendency towards sensing. Our result of 82.6% is even slightly higher than the results of the extant studies. With regard to the distinction between thinking and feeling, all eight comparable studies point to a predominant existence of the thinking type among accounting students. Our result of 60.9% thinking type accounting students is exactly in line with the other results. Last but not least, all eight comparable studies point to the dominance of the judging type and the inferiority of the perceiving type among accounting students. Our result, with 89.1% judging type accounting students, is still considerably above the other results.

3.3. Do accounting students show different psychological traits than the students of specific other majors?

The contrast group of the non-accounting students is broad in nature and, thus, very heterogeneous. To further break down the non-accounting group into the 7 specific non-accounting majors, a two-way ANOVA was performed, controlled for gender and interaction effects. The controls are relevant here, since the gender of an individual is strongly connected to both the choice of the major as well as the personality traits. Interaction effects might also play a role if the two gender groups in a specific major show different traits. The results of the ANOVA are summarised in Table 6. The orthogonal contrasts of the ANOVA model are shown in Table 7 together with model

statistics. The intercept can be understood as the mean of the group of male accounting students. All other coefficients can be interpreted as a deviation from this value or as a group difference, respectively. The coefficients for female students of business information systems are not available as there are only male students in that major.

Table 6. Results of two-way ANOVA by MBTI-trait
controlled for gender and interaction effects

Criterion	Predictor	*df*	Sum of Squares	Mean Square	*F*	*p*
Extraversion vs. Introversion (EI_Metrics)						
	Major	7	1,578	0,226	1,165	0,330
	Gender	1	0,056	0,056	0,288	0,593
	Interaction	6	0,804	0,134	0,692	0,656
	Residuals	100	19,358	0,194		
Sensing vs. Intuition (SN_Metrics)						
	Major	7	1,931	0,276	3,423	0,003***
	Gender	1	0,000	0,000	0,003	0,955
	Interaction	6	1,329	0,222	2,748	0,016**
	Residuals	100	8,060	0,081		
Thinking vs. Feeling (TF_Metrics)						
	Major	7	3,825	0,547	3,063	0,006***
	Gender	1	2,075	2,075	11,631	0,001***
	Interaction	6	2,928	0,488	2,735	0,017**
	Residuals	100	17,839	0,178		
Judging vs. Perceiving (JP_Metrics)						
	Major	7	2,292	0,327	2,542	0,019**
	Gender	1	0,087	0,088	0,679	0,412
	Interaction	6	0,243	0,041	0,315	0,928
	Residuals	100	12,880	0,129		

Signif. codes: 0 '***' 0.01 '**' 0.05 '*' 0.1

Table 7. Orthogonal contrasts of the ANOVA and model statistics

	Dependent variable:			
	EI_Me-trics	*SN_Me-trics*	*TF_Me-trics*	*JP_Me-trics*
Male Students				
Intercept (Accounting, male)	0,191**	0,222***	0,213**	0,387 ***
	–0,092	–0,059	–0,088	–0,075
… vs. Marketing	–0,158	–0,472***	–0,380*	–0,369 **
	–0,202	–0,130	–0,194	–0,165
… vs. Human Resource Management	–0,125	0,012	0,087	–0,226
	–0,202	–0,130	–0,194	–0,165
... vs. Project Management	0,249	0,138	0,227	0,234
	–0,217	–0,140	–0,208	–0,177
… vs. Tax Law	0,059	–0,197	0,137	–0,097
	–0,238	–0,154	–0,229	–0,194
… vs. Supply Chain Management	0,809 *	0,078	–0,813 *	0,403
	–0,449	–0,290	–0,431	–0,367
… vs. Business Information Systems	–0,325	–0,055	0,020	0,087
	–0,270	–0,174	–0,259	–0,220
… vs. Business Law	0,309	0,078	0,212	–0,124
	–0,238	–0,154	–0,229	–0,194
Female Students				
… vs. Accounting, female	–0,113	0,074	–0,152	0,018
	–0,130	–0,084	–0,125	–0,106
… vs. Marketing	0,260	0,316 *	0,109	0,206
	–0,262	–0,169	–0,251	–0,213
… vs. Human Resource Management	0,304	–0,193	–0,405 *	0,137
	–0,251	–0,162	–0,241	–0,205

Table 7. (*cont.*)

	Dependent variable:			
	EI_Me-trics	SN_Me-trics	TF_Me-trics	JP_Me-trics
... vs. Project Management	–0,094	–0,217	0,146	–0,002
	–0,296	–0,191	–0,284	–0,242
… vs. Tax Law	0,113	–0,374 *	–0,798 **	–0,150
	–0,337	–0,218	–0,324	–0,275
… vs. Supply Chain Management	–0,687	0,226	0,952	–0,018
	–0,636	–0,410	–0,610	–0,518
… vs. Business Information Systems	n/a	n/a	n/a	n/a
… vs. Business Law	–0,027	–0,474 *	–0,613	0,003
	–0,322	–0,208	–0,309	–0,263
Observations	115	115	115	115
R2	0,112	0,288	0,331	0,169
Adjusted R2	–0,012	0,188	0,237	0,053
Residual Std. Error (df = 100)	0,440	0,284	0,422	0,359
F Statistic (df = 14; 100)	0,900	2,890 **	3,535 **	1,454
p-value	0,561	0,001	0,000	0,143

Signif. codes: 0 '***' 0.01 '**' 0.05 '*' 0.1

Based on the ANOVA results, the choice of the major does not significantly explain the value of the EI_Metrics and thus the magnitude of extraversion vs. introversion (p-value = 0.330). The same is true for the gender of the individuals (p-value = 0.593) and the interaction effect between both variables (p-value = 0.656). The ANOVA model does not show a significant model statistic (R^2 = 0.112, p-value = 0.5614). The orthogonal contrasts only show a weakly significant higher EI_Metrics for male students of supply chain management when compared to male accounting students.

Conversely, the ANOVA shows that the choice of major significantly determines the SN_Metrics, and thus the magnitude of sensing vs. intuition (p-value = 0.003), while gender does not (p-value = 0.955). The interaction effect between both variables again adds another significant effect (p-value = 0.016). Due to the orthogonal contrasts, this effect can mainly be attributed to a considerable gender difference in the marketing major. Male marketing students have a highly significant lower SN_Metrics than male accounting students (p-value = 0.000). Female marketing students, on the other hand,

have a weakly significant higher score (p-value = 0.064) than male accounting students. Another difference can be observed with female students of business law, who show a significantly lower score (p-value = 0.025), and with female tax law students who show a weakly significantly lower score (p-value = 0.088). According to the effects shown, the model statistics are significant (R^2 = 0.288, p-value = 0.001).

The ANOVA results further point out that the TF_Metrics is strongly impacted by the analysed variables. In particular, the choice of major shows a highly significant impact on the TF_Metrics, and thus on the magnitude of thinking vs. feeling (p-value = 0.006). The same is true for gender, which shows a highly significant impact (p-value = 0.001) and the interaction effect between both which shows a significant impact (p-value = 0.017). As shown in the orthogonal contrasts, this effect is due to a whole variety of smaller aggregated effects all pointing in the same direction. Male marketing students (p-value = 0.053), male supply chain management students (p-value = 0.062), female human resource management students (p-value = 0.096), female tax law students (p-value = 0.015), and female business law students (p-value = 0.050) all show at least weakly significantly lower thinking in comparison to male accounting students. According to the effects shown, the model statistics is significant (R^2 = 0.331, p-value = 0.000).

The JP_Metrics shows in the ANOVA table a less pronounced although significant impact of the choice of the major on judging vs. perceiving (p-value = 0.019). Gender does show significance (p-value = 0.412), nor does the interaction effect between both variables (p-value = 0.928). The impact of the major on the JP_Metrics is mainly due to the highly significant difference of the male marketing students, who show a significantly lower score than the male accounting students, as shown in the contrasts. According to the effects shown, the model statistics are insignificant (R^2 = 0.169, p-value = 0.143).

The multiple pairwise comparisons applying Tukey HSD (Honest Significant Differences) show particular significances between the majors, but no systematic behaviour could be found here due to the small numbers of students in each major and the multitude of pairwise comparisons.

Comparable studies are presented by Briggs et al. (2007), who compared accounting students and psychology students. What is striking here is that accounting students have a strong STJ tendency, with 38.2%, while psychology students show only 11.6%. In contrast, the share of NF personalities among accounting students is only 9.3%, while this share among psychology students is 38.4%.

Morgan and Barbour (2008) performed a comparable study which compared management/marketing students with non-management/marketing students. This study is relevant here since, in the present study, the marketing major shows the strongest contrasts to the accounting major. According to the authors, management/marketing students show a high proportion of extroverts, with 71.9%, sensing-types, with 64.9%, feeling-types, with 59.7%, and perceiving-types, with 57.9%. However, since the authors chose the contrast group very heterogeneously, the results are not directly comparable, but they show clear group differences between different majors at business schools.

Discussion and conclusion

Hypothesis 1 "Business students show a different distribution of personality traits than the overall population" was supported by the data and the analysis. Students of business administration show significantly more frequent extraversion, thinking, and judging preferences than the overall population. The extrovert is more outgoing, communicative, and can be described as a "socialiser" compared to other individuals. As business students tend to be more often the thinking type, they are, on average, more rational deciders as they link decisions to logical cognitive processes. Furthermore, since business students more frequently show the judging type, it can be assumed that they tend to act analytically and structured.

Basically, it can be assumed that individuals decide to study business administration if they tend to have a numerical affinity and thus differ from the overall population, and that these individuals prefer social aspects in the choice of their study programme. Furthermore, it should be noted that access to higher education in Germany is restricted and requires an A-Level diploma, i.e. a 12 or 13-year school degree. In this respect, a certain pre-selection of students cannot be ruled out.

Hypothesis 2 "The personality traits of accounting students differ significantly from other business students" was also supported by the data and the analysis. Our data indicate that potential accounting students show greater analytical skills and rational thinking than other students of business administration, but they lack extraversion and thus team-play and interpersonal skills. Furthermore, they are lacking intuition and thus creativity and "out of the box"-thinking. As a result, the talent pool for the accounting profession is more likely to have "bean counters" than "business partners". Consequently, this self-selection scheme reinforces the stereotypes of accountants.

Hypothesis 3 "There are significant contrasts between accounting students and individuals from other majors" was supported for particular majors. In particular, the marketing major differs significantly in many aspects. It should be noted that the present study was carried out at only a single university. Self-selection biases, which are not induced by personality differences, can occur both in the choice of the university as well as in the choice of subjects. For example, the choice of the lecture content by the lecturer, the teaching style of the lecturer, or the offer of other majors may influence the choice of the major.

Macroeconomic changes including globalisation, technology advances and complex regulations indicate that the accounting profession must participate in the change by converting to more soft skills such as flexibility and adaptability to change rather than content-based technical skills. These soft skills are identified with certain personality types that need to be recruited into the profession. The necessity to re-evaluate and adapt accounting education towards the required change is apparent. Educators need to teach personal and interpersonal skills and not only technical and functional abilities (Richardson et al., 2015). Booth and Winzar (1993) suggest that accounting educators should aim to improve skills such as having an open mind to new information when

solving problems, communication skills and developing interpersonal skills. This can be done through teaching strategies that involve more assessments, project work with other business courses, realistic case studies, the integration of behavioural science, and the reading of professional research journal articles.

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