ISSN 2164-2885

International Journal for Business Education

April 2018
Number 158

la Société Internationale pour l'Enseignement Commercial

The International Society for Business Education

ISSN 2164-2877 (print)
ISSN 2164-2885 (online)

International Journal for Business Education
Number 158
ISSN 2164-2877 (print)
ISSN 2164-2885 (online)

P.O. Box 84
Pardeeville, Wisconsin 53954
USA

The *International Journal for Business Education* is a peer-reviewed journal. Articles that are included have been subjected to a blind-review by external peers.

ISSN 2164-2877 (print)
ISSN 2164-2885 (online)

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Message from the
International President

Dear SIEC-ISBE Friends,

Welcome to the 158th edition of The *International Journal for Business Education*, formerly known as *The Review*. Our journal is a double blind, peer-reviewed publication for global business educators by global business educators. The journal is published once per year. ISBE members provide in-depth research articles that can be helpful in the classroom or with administrative responsibilities. Each article, based upon research conducted by our members, adds to the body of knowledge in global business education. As in the past, information about the upcoming conference will be included.

I want to thank Tamra Davis, Ph.D. of the USA Chapter and Michaela Stock, Ph.D. of the Austrian Chapter for taking on the task of editors. I also want to take a moment to thank our reviewers. The complete list of reviewers can be seen on our Editoral Board page. Your expertise was beneficial in helping improve the quality of the accepted manuscripts and offering guidance for improvement to those authors whose work was not accepted this year.

Our international conference 2018 will be located in Reykavik, Iceland. The conference theme, Start-Ups, is an exciting theme that is very appropriate in today´s business and Business Education. I hope to see you at the 2018 conference and our future conferences as well. Future conferences are planned in the following maritime locations:

2019—The Island of Cefalonia, Greece

2020—Baltic Sea Cruise Stockholm-Helsinki-St Petersburg-Tallinn-Stockholm

2021—An Asian location

With warmest SIEC-ISBE regards until we meet again, digitally or face-to-face

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ISSN 2164-2877 (print)
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Review Process

The International Journal for Business Education is a double-blind, peer-reviewed journal. Due to the international nature of the journal, two or more editors work together to facilitate the review process. The editor from outside of the United States handles all manuscripts that originate from the United States. This editor assigns the manuscripts to the appropriate reviewers, handles all correspondence with the author(s) and reviewers, and makes the final decision on acceptance. The editor from the United States handles manuscripts that originate from outside the United States. Again, this editor assigns the manuscripts to the appropriate reviewers, handles all correspondence with the author(s) and reviewers, and makes the final decision on acceptance. By following this process, it is possible that one or more of the editors will also have a manuscript published in the journal. Additionally, it is also possible that someone who has submitted a manuscript is also selected to be a reviewer by the editor from outside their geographic area.

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ISSN 2164-2877 (print)
ISSN 2164-2885 (online)

Preface

We would like to thank the wonderful professionals who filled the role of reviewers for this year's journal. Due to the number of manuscripts received, multiple reviewers were needed. Without their assistance, the job of editor would have been much more difficult. Thank you to the entire Editorial Board who are SIEC-ISBE members and volunteered to help when asked. Thank you.

We hope that you find the articles included in this year's The *International Journal for Business Education* interesting. Thank you to everyone who submitted a manuscript for consideration. Without your submissions, we would not have had a journal.

Tamra S. Davis, Ph.D. and
Michaela Stock, Ph.D.
SIEC-ISBE Editors 2018

ISSN 2164-2877 (print)
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ISSN 2164-2877 (print)
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Understanding Graduation Rates at Higher Education Institutions: A Forecasting Model

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ABSTRACT

Graduation rates and degree completion have always been a concern for students, students' families and universities. Moreover, many consider college degree completion rates to be among one of the most important indicators of institutional quality according to a report from the Higher Education Research Institute published in the United States of America. This research studied factors that can explain graduation rates which include student-faculty ratio, financial factors, and enrollment status. Data was collected and analyzed for state and private universities, and a Multiple Regression Model (MLR) was built to forecast graduation rates. The model was able to highlight variables that significantly relate to graduation rates. Researchers can use this article to understand the different factors that correlate with degree completion and to forecast graduations rates at Higher Education Institutions. The international researcher can explore replicating the forecasting model at universities outside the United States of America.

Introduction

Graduation rates are usually defined as the time to complete a degree program within four to six years of starting the degree (Paterson & Gordon, 2010), and graduation rate has become one of the commonly regarded statistics as a primary indicator of institutional performance for higher education (DeAngelo, Franke, Hurtado, Pryor, & Tran, 2011). In the DeAngelo, et al. (2011) report published by the Higher Education Research Institute, the authors stated that high graduation rates are important to society because greater degree attainment is associated with higher salaries and lower unemployment rates; therefore, impacting the economic health of the United States. Recent research has shed the light on the importance of increasing graduation rates at higher education institutions (Haynes, 2016; Joy, 2017). Before 1985, institutional statistics on universities' graduation rates did not exist (Cook & Pullaro, 2010), and now graduation rates have come to reflect overall quality of student learning, intellectual involvement, how well students are integrated into campus life, and how effectively a campus delivers what students expect and need. For instance, in a study performed on Texas high schools, concluded that the accountability pressure on schools affected college graduation rates. In 1993, a test-based accountability system was introduced in Texas resulting in sanctions

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put in place for underperforming schools (Deming, Cohodes, Jennings, & Jencks, 2016). This caused school officials to pressure students to achieve high test scores to avoid government punishments. The study found that this pressure affected students' college enrollment and completion rates as well as their job earnings as adults. Subsequently, students enrolled in underperforming schools had more pressure to do well on state tests which resulted in an increase in students' college enrollment and competition rates. Thus, the study found that high school accountability influences graduation rates. However, this paper proposes that the relative size of the college's student population, financial factors, and enrollment statuses has a statistically significant relationship with the institutional dedication to the student and ultimately the graduation rate. This paper chose to focus on these factors to determine whether our hypothesis holds true for over 1000 higher education institutions universities in the United States of America as shown in the conceptual model section.

This paper is divided into six sections. The first section introduces the topic and the need for a model to forecast graduation rates. The second section reviews and integrates the available literature history and the main authors that addressed graduation rates. The third section proposes a conceptual model that addresses the variables that predict graduation rates. The fourth section explains the data collection and analysis processes, the fifth section discusses the results and its implications, and the sixth section summarizes the paper with an overall conclusion and areas for future research.

Literature Review

Graduation rates have continued to be a popular indicator of institutional performance. Other studies have been performed about college graduation rates using different variables than this study. For instance, eight cohorts of undergraduate college students in the 1990s were studied resulting in the conclusion that there is a positive correlation between state funding and college graduation rates (Zhang, 2009). It was found that for every 10% increase in state funding, there was a 0.64% increase in graduation rates per full-time student. The author concluded that "it is the interaction between student characteristics (including commitments to their educational goals and institutions and the academic and social contexts of the institutions that ultimately determines students' college persistence and graduation" (Zhang, 2009, p. 716).

Additionally, Montgomery and Beronda (2012) used this same study as a resource for their study on graduation rates. In their study, they compared graduation rates of ten historically black colleges and ten predominately white institutions. While their main independent variable was race, they also used other variables such as geographical location, socioeconomic factors, and population size. Their results suggested that historically black colleges have lower graduation rates; thus, affecting state funding. Both Zhang's, and Montgomery's and Beronda's studies used graduation rates as a performance measure for determining funding levels. Furthermore, both studies used the Integrated Postsecondary Education Data System which

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this paper also utilized with the difference being that this study used data from more recent years.

Similar to Montgomery's and Beronda's study, Mooring and Mooring (2016) hypothesized that the graduation rates for minority community college transfer students vary and that the factors that best predict timely graduation also vary by ethnicity. They found that their hypotheses were valid. The results concluded that the most predictive factor for African American transfer students was enrollment in a four-year transfer program at the community college while the predictive factor for Hispanic Americans was obtaining a credential before transferring. Furthermore, a high GPA was the best predictive factor for Asian American transfer students.

Another study utilized prediction models using graduation rates as a performance indicator of community colleges (Moosai, Walker, & Floyd, 2011). Therefore, this study was not focused on what specific variables impact graduation rates, but was more concerned with how graduation rates could predict a higher education institution's performance. From this study using data from California, Florida, and Michigan community colleges, the results concluded that graduation rates could predict whether a college was exceeding, meeting, or below expectations. Yet, the researchers warned that the performance of an institution consists of numerous factors, not just graduation rates. Thus, this study will determine which major variables are significantly related to graduation rates which can predict institutional performance.

Another community college study used a regression model to compare the differences in graduation rates between students who transferred from community colleges to students who stayed at the college for all four years (Friedl, Pittenger & Sherman, 2012). They examined 417 University of Tennessee students and compared the performance of students who had previously taken an intermediate math course at a community college with those who had taken the same course at a four-year institution. It was found that the students who transferred performed poorer in college-level math courses at the university suggesting that community college transfer students may result in decreasing a university's four-year graduation rate.

Additionally, Melguizo (2008) found that the selectivity of institutions impacted graduation rates. In her study, Melguizo sampled 3,000 students across the nation. While this study used three specific independent variables, Melguizo used three sets of variables: student characteristics, pre-college achievement, and postsecondary institutional characteristics. Her regression analysis concluded that students who attended the most selective universities were more likely to graduate with a bachelor's degree.

Instead of just focusing on student characteristics, Crawford's (2015) study solely focused on the impact on institutional expenses. From his study using ANOVA, Crawford discovered that library and instruction expenses had a strong, positive correlation with college retention and graduation rates. Thus, he concluded that since private schools typically have larger funds for

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library and instruction expenses, more students graduate from private than public colleges, on average. Additionally, Crawford's results can support Melguizo's study about the impact of the selectivity of schools. From both studies, it can be hypothesized that since private schools tend to be more selective and have more funding that they have higher graduation rates than public colleges and universities.

Conceptual Model

Previous studies have successfully determined factors that impact graduation rates and how graduation rates impact institutional performance. However, none of the studies specifically focused on areas related to the number of applications received and accepted, student enrollment size, financial factors, enrollment statuses and student/faculty ratio. Furthermore, none of the studies had a similar scope as this research since this paper is using data from 1,155 higher education institutions across the United States.

This research proposed a framework that will predict graduation rates based on multiple independent variables including applications received, applications accepted, new students enrolled, part-time undergrads, out-of-state tuition and student/faculty ratio.

Figure 1 shows the multiple variables addressed in this paper. As shown in the conceptual model, this research focused on understanding the potential relationships between graduation rates (dependent variable) and the six independent variables in order to forecast the graduation rates.

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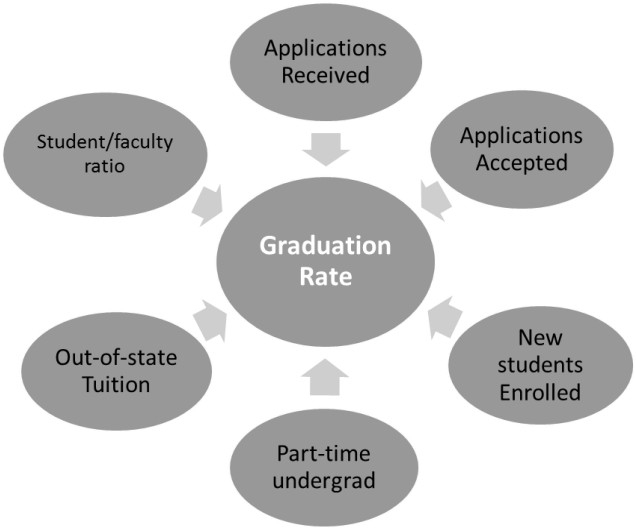

Figure 1: The Conceptual Model Dependent and Independent Variables

Variables Definitions

The six independent variables are defined as follows:

- Number of applications received: Total number of applications that were submitted to the school in the school year documented.
- Number of applications accepted: Number of applications that were submitted and accepted for spring or fall entry by the university or college.
- Number of new students enrolled: Number of new students entering the university at the start of the August or fall semester.
- Number of part time undergraduate: Total number of undergraduates in the program that are part-time students as defined by the university or college (typically less than 12 credits).
- Out of state tuition: Amount of tuition paid by students that are commuting out of state.
- Student/faculty ratio: Ratio of students to faculty members in the university.

The dependent variable in this paper is Graduation Rate. This variable is the percentage of a higher education institution's first-time, first-year undergraduate students who complete their program within 150% of the published time. In this proposed conceptual model, graduation rate is considered exclusively for four-year programs.

The following section describes the data collection and the analysis processes this study implemented.

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Data Collection and Analysis

Research Main Question.

The main question in this research paper was what can forecast graduation rates? To answer this question, the following hypothesis was proposed and tested:

- Research Hypothesis
  - H_0 (null hypothesis): There is no correlation between "Applications Received, Applications Accepted, New students Enrolled, Part-time undergrads, Out-of-state Tuition and Student/faculty Ratio" and "Graduation Rates."
  - H_1 (alternative hypothesis): There is a correlation between "Applications Received, Applications Accepted, New students Enrolled, Part-time undergrads, Out-of-state Tuition and Student/faculty Ratio" and "Graduation Rates."

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Data Collection Approach.

Data from 1,155 colleges across the nation was collected from the U.S News and World Report (National Universities Ranking, 2016), universities' websites, and phone calls to the universities made to verify any old/missing data. The number of higher education institutions collected grouped per state is shown in Table 1.

Data Collection Approach.

Data from 1,155 colleges across the nation was collected from the U.S News and World Report (National Universities Ranking, 2016), universities' websites, and phone calls to the universities made to verify any old/missing data. The number of higher education institutions collected grouped per state is shown in Table 1.

Table 1
Number of Higher Education Institutions per State

State	# of HE Institutions	State	# of HE Institutions
Alaska	2	Montana	7
Alabama	24	North Carolina	44
Arkansas	12	North Dakota	7
Arizona	4	Nebraska	14
California	61	New Hampshire	11
Colorado	13	New Jersey	26
Connecticut	16	New Mexico	8
District of Columbia	6	Nevada	2
Delaware	4	New York	89
Florida	25	Ohio	44
Georgia	35	Oklahoma	13
Hawaii	2	Oregon	13
Iowa	28	Pennsylvania	78
Idaho	6	Rhode Island	7
Illinois	47	South Carolina	24
Indiana	36	South Dakota	9
Kansas	20	Tennessee	30
Kentucky	21	Texas	51
Louisiana	20	Utah	5
Massachusetts	48	Virginia	37
Maryland	21	Vermont	13
Maine	12	Washington	15
Michigan	33	Wisconsin	27
Minnesota	24	West Virginia	15
Missouri	31	Wyoming	1
Mississippi	14		

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The detailed statistics of the six interdependent variables: applications received, applications accepted, new students' enrolled, part-time undergrads, out-of-state tuition and student/faculty ratio, are shown in Table 2.

Table 2
Statistics of the Six Interdependent Variables per State

State	Sum of app. Received	Sum of app. Accepted	Sum of new Students Enrolled	Sum of Part-time Undergrads	AVG of out-of-state Tuition	AVG of Student/faculty Ratio
Alaska	339	263	144	2,718	$ 6,393	10.7
Alabama	48,797	36,839	17,795	23,264	$ 5,368	16.6
Arkansas	19,603	17,078	10,808	11,181	$ 5,161	16.3
Arizona	33,276	27,870	10,432	15,615	$ 7,121	18.6
California	266,518	172,911	54,577	82,157	$ 11,461	14.4
Colorado	51,705	36,058	14,420	18,811	$ 8,821	19.7
Connecticut	60,265	35,503	11,497	18,359	$ 12,936	12.7
District of Columbia	35,380	16,348	6,201	4,473	$ 13,989	8.9
Delaware	17,334	13,066	4,521	6,980	$ 7,893	18.2
Florida	77,542	53,498	21,190	56,376	$ 8,843	16.3
Georgia	95,097	59,786	28,922	36,455	$ 6,756	15.2
Hawaii	5,079	3,382	2,127	3,282	$ 3,690	13.8
Iowa	44,683	37,977	15,875	15,137	$ 10,783	13.8
Idaho	10,945	9,050	5,333	10,292	$ 6,836	13.9
Illinois	122,948	86,174	34,133	39,473	$ 10,202	13.6
Indiana	101,685	81,821	37,576	49,032	$ 9,651	14.4
Kansas	28,339	21,788	12,443	16,025	$ 7,349	14.8
Kentucky	41,229	32,340	16,667	24,066	$ 6,863	14.5
Louisiana	52,691	45,484	25,335	27,746	$ 5,744	18.0
Massachusetts	159,329	100,911	34,191	46,978	$ 12,830	13.3
Maryland	63,458	39,904	13,379	19,927	$ 10,117	13.9
Maine	17,376	11,453	4,731	6,674	$ 9,865	15.9
Michigan	110,967	86,944	37,324	62,464	$ 9,085	17.7
Minnesota	52,159	37,924	19,580	34,144	$ 10,212	14.5
Missouri	60,632	48,425	22,156	38,318	$ 8,183	14.9
Mississippi	29,305	18,985	9,172	8,120	$ 5,582	16.0
Montana	9,782	8,241	5,045	5,175	$ 6,692	16.6
North Carolina	127,170	76,746	31,553	27,820	$ 8,395	13.8
North Dakota	7,911	6,546	4,550	3,400	$ 5,548	16.4
Nebraska	21,724	20,423	10,792	13,563	$ 6,808	15.0
New Hampshire	33,547	22,531	6,498	8,689	$ 12,276	16.2
New Jersey	129,267	66,899	18,576	39,184	$ 9,094	15.5
New Mexico	12,487	10,581	5,469	11,478	$ 6,071	16.1
Nevada	3,068	2,569	1,624	2,989	$ 6,995	11.5
New York	336,847	210,346	67,668	94,222	$ 11,037	14.0

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Ohio	131,720	103,317	48,317	53,355	$ 1,117	14.4
Oklahoma	21,597	18,859	10,540	14,509	$ 5,803	17.0
Oregon	25,936	20,742	7,369	5,034	$ 12,046	14.2
Pennsylvania	226,449	145,665	50,958	56,339	$ 11,784	13.7
Rhode Island	36,655	21,950	7,106	9,640	$ 12,896	14.8
South Carolina	45,498	33,852	14,203	12,738	$ 7,947	15.7
South Dakota	8,605	7,719	5,474	4,972	$ 6,146	16.1
Tennessee	59,939	42,992	20,739	25,894	$ 7,497	14.3
Texas	134,473	99,820	53,111	83,262	$ 6,431	17.0
Utah	17,694	14,762	9,834	16,728	$ 5,505	17.6
Virginia	118,319	72,610	27,200	21,749	$ 10,084	13.6
Vermont	19,847	13,944	4,769	4,038	$ 13,164	11.9
Washington	45,755	31,896	12,982	11,046	$ 10,718	14.9
Wisconsin	71,058	55,233	23,701	28,221	$ 9,722	15.6
West Virginia	28,214	23,631	10,762	10,803	$ 7,881	14.6
Wyoming	2,029	1,516	1,073	1,488	$ 5,988	15.1

Data Analysis.

Standard multiple regression analysis was performed to test the research hypothesis. A multiple linear regression (MLR) model was constructed with the six interdependent variables discussed in section 0 all 1,155 higher education institutions and the dependent variable "Graduation Rate". The results of the hypotheses testing using standard multiple regression are shown in Table 3 and the detailed MLR output is shown in Table 4 and Table 5.

Table 3
Results of Hypothesis Testing

Relationship Strength	Significant Relationship	Significance Level	Significant Contribution
$R^2 = 0.426$	Yes	0.00 < 0.05	• Number of applications received • Number of Part-time undergrad • Out-of-state tuition

Table 4
The Results of the Multiple Linear Regression Model for Graduation Rates

Regression Statistics	
Coefficient of Determination (R^2)	0.425752

Table 5
Multiple Linear Regression Output

	Coefficients	**Standard Error**	**t Stat**	**P-value**
Intercept	39.77871	2.27782	17.4635	0.00000
Number of applications received	***0.001411***	***0.000361***	***3.908984***	***0.00010***

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Number of application accepted	-0.00055	0.000659	-0.83221	0.40547
Number of new student enrolled	-0.00039	0.001087	-0.35874	0.71986
Number of Part-time undergrad	***-0.00242***	***0.000296***	***-8.1865***	***0.00000***
Out-of-state tuition	***0.002337***	***0.000122***	***19.09706***	***0.00000***
Student/faculty ratio	-0.10323	0.101047	-1.0216	0.30718

The results in Table and Table 4 show that this research conceptual model that includes applications received, applications accepted, new students enrolled, part-time undergrads, and out-of-state tuition and student/faculty ratio explains almost 43% of the variation in the graduation rate.

The Refined Conceptual Model.

In order to find the significant unique contribution of individual variables on the dependent variable, the observed levels of significance (p-value) were examined. The three variables that significantly relate to the dependent variable (graduation rate) are number of applications received, number of part-time undergrads and out-of-state tuition.

To improve the forecast of the developed MLR model, only the significant variables with p-value of 0.0 (in bold italic in Table 5) were included and a refined MLR model was built as shown in Table 6 and Table 7.

Table 6
The Results of the Refined Multiple Linear Regression Model for Graduation Rates

Regression Statistics	
Coefficient of Determination (R^2)	0.424297

Table 7
Refined Multiple Linear Regression Output

	Coefficients	**Standard Error**	**t Stat**	**P-value**
Intercept	37.37284	1.175189	31.80155	0.00000
Number of applications received	0.000997	0.000125	7.978915	0.00000
Number of PT undergrad	-0.00254	0.000279	-9.10238	0.00000
Out-of-state tuition	0.002421	0.000107	22.71887	0.00000

The results in Table 6 and Table 7 show that the conceptual model that includes number of applications received, number of part-time undergrads and out-of-state tuition explains almost 42.4 % of the variation in the graduation rate and the three independent variables significantly relate to graduation rate.

ISSN 2164-2877 (print)
ISSN 2164-2885 (online)

The regression model shown in Equation 1 intended to forecast graduation rate. Equation 1 demonstrates the interrelationship between the research variables of graduation rate, number of applications received, number of part-time undergrads and out-of-state tuition.

$$Graduation\ \ Rate \cong\ 37.373 + 0.000997\ (number\ of\ applications\ received) - 0.00254\ (number\ of\ parttime\ undergrads.) +\ 0.00242\ (out - of - state\ tuition) \quad (1)$$

The positive contributions of number of applications received and out-of-state tuition demonstrate that the increase in these two variables positively correlates with an increase in graduation rate. The negative contribution of number of part-time undergraduates, however, demonstrates that the increase in the number of part-time undergraduates negatively correlates with graduation rate.

Discussion

Standard multiple regression analyses were performed to test the research hypothesis and found that the six variables discussed in this paper (applications received, applications accepted, new students enrolled, part-time undergrads, out-of-state tuition and student/faculty ratio) were able to explain almost 43% of the variation in the graduation rate.

The conceptual model was refined to include the three significant variables only (with p-value of 0.0) and the refined multiple regression model that includes number of applications received, number of part-time undergrads and out-of-state tuition was able to explain almost 42.4 % of the variation in the graduation rate.

The coefficient of determination (R^2) which explains how much variation in the dependent variable (graduation rate) was explained by the independent variables is almost the same when including all six variables; the significant and insignificant ones. Therefore, the significant variables were considered only when building the refined conceptual model.

The refined conceptual model showed that the number of applications received and out-of-state tuition positively relates to graduation rate while part-time undergraduates negatively relates to graduation rate.

To test the applicability and practical use of our model in forecasting graduation rates, the developed conceptual model in this research paper was used to forecast the graduation rates for two universities in Florida, USA as shown in Table.

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Table 8
A Forecasting Example

	No. of Applications rec'd	No. of PT undergrad	Out-of-state tuition	**Actual Graduation rate**	**Forecasted Graduation Rate**
Stetson University	1557	81	12315	**73%**	**69%**
University of Central Florida	6986	7152	6618	**46%**	**42%**

The results in Table show that the multiple regression model developed in this research was able to forecast with close proximity the graduation rates at Stetson University and the University of Central Florida.

The ability to forecast graduation rates with such proximity could predict whether the educational institution was exceeding, meeting, or below expectations. This helps in institutional planning and reflects overall quality of student learning, intellectual involvement and how effectively a campus delivers what students expect and need.

Conclusion and Future Research

This section summarizes the results of this paper and how the research conceptual model, data collection and data analysis were able to predict graduation rates. The data collection and analysis performed in section 4 led to three significant variables that relate to graduation rate: number of applications received, number of part-time undergrads and out-of-state tuition. These three variables were able to explain 42.4 % of the variation in the graduation rate.

This research was able to reject the null hypothesis and support at 5% level of significance the alternative hypothesis that states: there is a correlation between "Applications Received, Applications Accepted, New students Enrolled, Part-time undergrads, Out-of-state Tuition and Student/faculty Ratio" and "Graduation Rates." The analysis showed that the increase in number of applications received and out-of-state tuition significantly increases graduation rate, while the increase in the number of part-time undergraduates significantly decreases graduation rates. Since the increase in the number of part-time undergraduates negatively relates to graduation rates, future research can look into institutional policies for hiring their part-time students to work on-campus as an incentive for them to become full-time students. In addition to the positive relationship this might have on graduation rates, students who work on-campus do not have to worry about commuting to work and have the opportunity to build strong connections with the institutions' faculty and staff. Further research can look into the commitment students work on-campus feel toward their degree completion and graduation when they have a secured job on-campus.

ISSN 2164-2877 (print)
ISSN 2164-2885 (online)

Future research can consider developing a "Linear Optimization" model. Optimization is the process of selecting values of decision variables that minimize or maximize a quantity of interest. The objective function can be to maximize graduation rate where the decision variables are: applications received, applications accepted, new students' enrolled, part-time undergrads, out-of-state tuition and student/faculty ratio. Each higher education institution can identify the appropriate constraints and limitations for each of the decision variables. For example the lowest acceptable value for out-of-state or the highest ratio of student/faculty. Higher education institutions can find the right combination of decision variables that maximize their graduation rates.

Since graduation rates have come to reflect overall quality of higher education institutions and how effectively a campus delivers what students expect and need, future research can also focus on gathering more data from universities as well as validating the data obtained to make sure it is up to date and correct. Additionally, a different study could be done specifically focusing on the graduation rates of four-year institutions since multiple studies have already been conducted only on two-year colleges as noted in this paper's references. Then, research could be executed to compare the variables that impact four-year graduation rates to two-year rates. Furthermore, a comparison could be made between graduation rates in public versus private universities or certain schools, colleges. Future research can replicate the forecasting model at universities outside the United States of America. And finally, future research can investigate further the interaction between the independent variables and how the interaction might relate to graduation rates.

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ISSN 2164-2877 (print)
ISSN 2164-2885 (online)

Revenge of the Nerds Revisited: Do Accounting and Finance Majors Differ from other Business Majors in Their Learning Styles, and do They Earn Higher Grades in a General Business Course?

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ABSTRACT

Decades of research spanning a range of educational domains have confirmed that students differ in their learning styles and that student performance is impacted by the degree of fit between these styles and the teaching and assessment methods deployed in courses (Allinson & Hayes, 1988; Cegielski, Hazen & Rainer, 2011; Drissi & Amirat, 2017; Honn & Ugrin, 2012; Visser, McChlery & Vreken, 2006.) In this study, the researchers investigate whether a capstone business course— designed to accommodate a diverse range of learning styles— can succeed in leveling the playing field, yielding results showing no significant differences in course grades as a function of students' learning styles. The second focus is examining the myth of bookish, nerdy accountants (Brighenti, 2010; Tuttle, 2016). The findings 'bust' the myth that more 'bookish' accounting and finance majors will earn higher course grades in a general business course. The paper concludes by noting some important implications of our study for future research and practice.

Introduction

Decades of research have confirmed that students differ in their learning styles and that student performance is impacted by the extent to which the teaching and assessment methods that are deploy in courses fit these styles (Allinson & Hayes, 1988; Cegielski, Hazen & Rainer, 2011; Drissi & Amirat, 2017; Honn & Ugrin, 2012; Visser, McChlery & Vreken, 2006.) The implication for practice is clear: Learning style research is relevant to all educators who are concerned with designing and implementing effective course curricula addressing the diverse learning preferences that students bring to real and virtual classrooms of the 21st Century (Al-Omari, Carter & Chiclana, 2016; Coffield, Mosely, Hall & Ecclestone, 2004; Hayes & Allinson, 1996; Yang, Hwang & Yang, 2013.)

Learning style refers to a student's preferred modality for learning, including types of learning materials, media, tasks, processes, and assessments (Drissi & Amirat, 2017; Visser, McChlery & Vreken, 2006.) Although several learning style models have been proposed over the years—including models developed by Honey & Mumford (1992) and Kolb (1984)—the validity and reliability of Felder-Silverman model (1988) has made it the most dominant and widely-used approach in the literature (Al-Azawei & Badii, 2014; Litzinger, Lee, Wise & Felder, 2007; Riding & Reyner, 1998; Yang, Hwang & Yang, 2013.)

ISSN 2164-2877 (print)
ISSN 2164-2885 (online)

Working with Solomon, Felder developed a 44-item *Index of Learning Styles (ILS)* instrument to differentiate learning styles on four key dimensions outlined in the Felder-Silverman model (Felder & Solomon, 1996.) The validity and reliability of the *ILS* has been firmly established across a number of studies spanning multiple domains of inquiry (e.g., Al-Azawei & Badii, 2014; Felder & Spurlin, 2005; Litzinger, Lee, Wise & Felder, 2007; Graf, Viola, Leo & Kinshuk, 2007; Riding & Reyner, 1998; Zwyno, 2003.) Table 1, compiled by Cegielski, Hazen & Rainer (2011), provides a succinct overview of the four *ILS* dimensions:

Table 1
Description of the Constructs Associated with Learning Styles

Construct	Description	Example
Active-Reflective	The manner in which one engages in processing information	Active learners prefer to engage in group discussions and apply information to common situations Reflective learners prefer to cogitate and internally process new information
Sensing-Intuitive	The extent to which one is inclined to embrace concrete or abstract forms of information to form a frame of reference for learning	Sensing learners prefer the empirical facts and tangible work Intuitive learners prefer theories and rely on their ability to identify general relationships
Visual-Verbal	The degree to which one favors either visual or textual input as the primary input mode in the learning process	Visual learners prefer to use pictures, diagrams, and charts in the learning process Verbal learners prefer textual input (written or spoken) of information in the learning process
Sequential-Global	The degree to which one prefers the presentation of information in an incremental linear series or holistic broad strokes	Sequential learners are inclined to apply a stepwise approach to assimilating new information, perhaps recognizing the "big picture" after comprehending the underlying components of the information Global learners more readily grasp the "big picture" but often miss the details that support the overall message of the information

The primary purpose of this study is to determine whether or not a capstone business course—designed to address a diverse set of learning styles— can succeed in overcoming individual differences

ISSN 2164-2877 (print)
ISSN 2164-2885 (online)

in learning preferences by yielding results showing no significant differences in course grades as a function of students' learning styles. This finding would support a key practical implication in the learning style literature for business educators: Designing courses to address diverse learning styles can help educators level the playing field for students bringing different learning preferences to the classroom (Al-Omari, Carter & Chiclana, 2016; Coffield, Mosely, Hall & Ecclestone, 2004; Hayes & Allinson, 1996; Yang, Hwang & Yang, 2013.)

The other key component of the study will examine the veracity of the perception that accounting and finance majors earn better grades in their courses than other majors in the business program at our institution. To this end, we will investigate whether or not a significant relationship exists among type of major and course grade earned, all within the comparatively field- and major-neutral setting of a required, senior-level strategic management capstone course expressly focused on the inclusion and integration of all functional areas in the analysis, decision-making, and conduct of a company's operations. Using the *ILS* to gain an increased understanding of how different business majors vary in their learning style preferences will provide crucial insights for instructors, department chairs, program administrators, and others charged with the task of ensuring the design and delivery of effective learning experiences targeting the needs of a diverse student body.

Hypotheses

Relationships between Learning Style Preferences and Course Grades

Felder and Spurlin (2005) advocated using the *ILS* to identify the diverse learning style profiles characterizing students enrolled in one's classes. This approach can help instructors to design and implement course activities addressing the learning needs of all of their students. Ironically, the true test of how well an instructor succeeds in this regard is a null finding in the form of an observation that no significant differences in course grades exist in the sample as a function of learning styles.

The researcher investigated this hypothesis in the context of a capstone course required of all business majors as part of their core experience. To control for unwanted variance due to differences in instruction and instructors, the same teacher was used across all three course sections in the study. Although many of the primary learning activities were delivered in a traditional live mode, the online learning materials, assignments, and grade-reporting were all made available through use of the web-based Desire2Learn (D2L) course management system. D2L is similar in features and functions to Blackboard and other online course management systems.

Online learning resources were leveraged in a second way through integrating a team-based competitive web-based computer simulation into the course. The *GLO-BUS* simulation is a popular entry-level strategic management simulation available through the McGraw-Hill Irwin family of learning resources (McGraw-Hill Irwin, 2017). A full one-third of the course grade depended on students' performance in the online simulation, requiring student teams to compete through making

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ISSN 2164-2885 (online)

management decisions across a range of business functions— operations, marketing, human resources, accounting, finance— all within the context of running a digital camera company.

Every effort was made to ensure that this capstone course in the business core was designed and implemented in such a way that it provided a rich learning experience covering the range of learning styles through including:

1. *Active and Reflective learning components*— the online simulation (learning through Actively *doing*) and the traditional examinations (learning through Reflectively *thinking*);
2. *Sensing and Intuiting learning components*— a focus on facts/details (Sensing) and seeing new relationships and the big picture (Intuiting) were both necessary for success in the online simulation and the examinations;
3. *Visual and Verbal learning components*— supported through the use of 21st Century learning materials incorporating greater use of visual/graphical learning approaches to balance and augment the more traditional verbal/textual word-based approach, as found in the textbook and online materials, including those available via the *GLO-BUS* simulation web-site; and
4. *Sequential and Global learning components*— Sequential learning supported through face-to-face lectures, textbook readings, and examinations, with Global learning supported through seeing complex interrelationships in a holistic manner via the online simulation.

The study builds on Felder and Spurlin's (2005) research by explicitly examining whether or not a sample comprised of students with diverse learning styles, taking a course designed to address the learning needs of these students, will yield a finding of no significant differences in course grades as a function of learning style:

Hypothesis 1: No significant differences in course grades will be observed in students preferring an Active learning style versus students preferring a Reflective learning style (*ILS* Dimension #1-Active—Reflective).

Hypothesis 2: No significant differences in course grades will be observed in students preferring a Sensing learning style versus students preferring an Intuiting learning style (*ILS* Dimension #2-Sensing—Intuiting).

Hypothesis 3: No significant differences in course grades will be observed in students preferring a Visual learning style versus students preferring a Verbal learning style (*ILS* Dimension #3-Visual—Verbal).

Hypothesis 4: No significant differences in course grades will be observed in students preferring a Sequential learning style versus students preferring a Global learning style (*ILS* Dimension #4-Sequential—Global).

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Relationships among Major and Learning Style Preferences

Of the many stereotypes surrounding the various fields, majors, and careers in business, perhaps none is so enduring as the myth of the nerdy, bookish accountant and financier, perpetuated through decades of media exposure and marked through such archetypal images as the veritable 'black-rimmed, thick-lensed glasses' (Brighenti, 2010; Tuttle, 2016.) One of the prevailing cultural myths at the academic institution is that if you are one of the 'cream of the crop' top students in the business program, you have what it takes to join the elite and become an accounting or finance major. Years of anecdotal evidence culled from dozens of students over the past two decades document the staying power of this culture-bound perception at the institution.

Before one can so quickly dismiss the power of anecdotal evidence as a basis for formulating testable hypotheses, one must not forget that focus groups or other qualitative methods— and even common sense or intuition— are acceptable methods of selecting mediating factors where little prior research exists on the topic of interest, as noted in Table 2 (MacKinnon, Coxe & Baraldi, 2011):

Table 2
Methods of choosing mediators

When there is substantial prior research on the topic	**When little prior research is available on the topic**
Literature review to determine conceptual theory and action theory links	Look for correlates of the outcome measure to determine conceptual theory links
Based on a psychological theory of the process	Focus groups and other qualitative methods
Prior mediation analysis	Common sense or intuition

To examine the myth of nerdy, bookish accounting and finance majors earning higher course grades in the context of a capstone business course, the researcher searched the literature and found no explicit learning style profile for these majors.

However, a meta-analytical study by Felder and Spurlin (2005) documented a consistent learning style profile among engineering students, measured by Felder & Solomon's (1996) *Index of Learning Styles (ILS)* across a dozen different institutions providing engineering programs. Administering the *ILS* to engineering majors produced a consistent picture of learning styles for those majors: engineering majors display a pronounced preference for Active, Sensing, Visual, and Sequential learning approaches.

ISSN 2164-2877 (print)
ISSN 2164-2885 (online)

This learning style profile is not surprising, given the fundamental nature of the engineering field and its focus on mastering facts regarding mathematics and the physical world (Sensing), acquired in a linear and rational method (Sequential), developing the ability to see and diagram how various parts/components will fit together in proper design (Visual), using physical and computer models to test one's knowledge (Active). These four learning style preferences increase the chances that an engineered bridge will not collapse but will instead function to support the desired weight capacity.

In contrast, engineers trained primarily through learning in a Reflective, Intuitive, Verbal, and Global mode would produce bridges designed through thought experiments involving flashes of creative insight, expressed in words with few diagrams, based on a 'big-picture' (Global) view of how a bridge should function. Of course, most if not all people would prefer the bridges they cross to be designed by engineers trained to design and build bridges in a more grounded, detailed, and visual manner.

Consistent with the meta-analytical findings of the Felder and Spurlin (2005) study, it was expected that like the engineers, the accounting and finance majors would express a learning style preference for mastering facts and details associated with their number-based fields (Sensing), acquiring these facts and details in a linear and rational mode (Sequential). Unlike the engineers, however, we expected the accounting and finance majors to focus more on thinking (Reflective learning) as opposed to doing, aligned with a preference for precise, detailed Verbal descriptions providing more less interpretive ambiguity and greater exactness of meaning (as opposed to Visual, graphical depictions providing far greater interpretive ambiguity and less precision in meaning).

At the other extreme, it was expected that other business majors— including marketing, management, human resources management, operations, and information systems majors— would manifest a preference for learning associated with developing an ability to see new and important relationships unfolding in social contexts (Intuiting), grasping the big picture of how these relationships are interconnected (Global), acquiring knowledge through a predominantly Visual style (seeing relationships, the big picture, etc.), all within a context of Active learning. Thus the researcher predicts that:

> *Hypothesis 5:* Accounting and finance majors will express a preference for a Reflective learning style, while other business majors will prefer an Active style (*ILS* Dimension #1- Active—Reflective).
>
> *Hypothesis 6:* Accounting and finance majors will express a preference for a Sensing learning style, while other business majors will prefer an Intuiting style (*ILS* Dimension #2- Sensing—Intuiting).
>
> *Hypothesis 7:* Accounting and finance majors will express a preference for a Verbal learning style, while other business majors will prefer a Visual style (*ILS* Dimension #3- Visual—Verbal).

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Hypothesis 8: Accounting and finance majors will express a preference for a Sequential learning style, while other business majors will prefer a Global style (*ILS* Dimension #4- Sequential—Global).

Relationships between Major and Course Grades

The final hypothesis concerns a test of the myth of a main effect for major on course grades, i.e., the perception that accounting and finance majors will earn higher course grades than other business majors:

Hypothesis 9: Accounting and finance majors will not earn significantly higher course grades in the capstone course than other majors in the business program.

The main effect prediction expressed in this final hypothesis completes the foundation for exploring the truth behind the myth of bookish accounting majors earning higher grades in a general business course. Hypotheses 5-8 will reveal crucial information regarding the veracity of the perception of bookish accounting majors characterized by learning style preferences for Reflective, Sensing, Verbal, and Sequential approaches such as those embodied in the traditional 'textbook' mode of learning.

While Hypotheses 1-4 show that the researcher does not expect to observe significant differences in course grades as a function of learning style preferences per se, it is important to investigate whether any differences in learning styles associated with different business majors have a *mediating* effect on the major—course grade relationship in the sense that learning style may augment or enhance the effects predicted in Hypothesis 9 above.

Taken together, the above hypotheses present an intriguing set of predictions relevant to all instructors who are concerned with designing and implementing effective course curricula addressing the diverse set of learning styles that students will inevitably bring to the real and virtual classrooms of the 21st Century. Results consistent with the predictions will advance the field through providing empirical support for the value in using Felder and Solomon's (1996) *ILS* as a means of: (1) testing whether a class aimed at addressing the diverse learning styles of these different majors can succeed in this regard through yielding no significant differences in course grades as a function of students' learning styles, and (2) identifying diverse learning styles associated with different disciplinary fields or majors.

Method

Participants and Procedures

Study data were obtained from 84 students (43 males, 41 females) enrolled in three sections of a capstone senior-level strategic management course offered at a regional Midwestern university with a total enrollment of 10,000. This class was the capstone business course required of all business majors as part of their core experience. To control for unwanted variance due to differences in instruction and instructors, the same teacher was used across all three course sections in the study. Participants

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completed the 44-item Felder and Solomon *Index of Learning Style* instrument and results were entered into an SPSS data file for subsequent analysis.

Variables and Measures

Two *control variables* were examined to rule these factors out as sources of undesired variation in the research study: age and gender. These data were obtained through self-reported background information provided by study participants on the final survey instrument page. Age was coded as the whole number value of each students' chronological age. Applying a dummy variable approach to gender in a regression paradigm, male students were coded as a "0" and female students were identified as a "1."

Since the study examined differences in learning styles associated with different business majors— and the effects of learning style in mediating the major-grade relationship— the researcher again applied a dummy variable approach, operationalizing the *independent variable* (major) in the following manner:

0= accounting and finance majors
1= all other business majors

Felder and Solomon's (1996) 44-item *Index of Learning Styles (ILS)* was used to measure students' preferences on the four style dimensions noted earlier. A copy of the *ILS* is attached in the Appendix. Following the recommendations of Litzinger, Lee, Wise, and Felder (2007), each "a" response to an item was coded as a "1", and each "b" response was coded as a "-1". With 11 items measuring key aspects of each of the four learning style dimensions, this approach yielded a score ranging from -11 to +11 for each dimension, providing the researcher with numerical measures of the four *mediating variables* employed in our study.

The Active—Reflective learning style dimension is measured by *ILS* items #1, 5, 9, 13, 17, 21, 25, 29, 33, 37, and 41. The Sensing—Intuiting dimension is assessed through items #2, 6, 10, 14, 18, 22, 26, 30, 34, 38, and 42. The Visual—Verbal dimension is evaluated via items #3, 7, 11, 15, 19, 23, 27, 31, 35, 39, and 43. The fourth and final Sequential—Global dimension is measured by items "4, 8, 12, 16, 20, 24, 28, 32, 36, 40, and 44.

Once again, each "a" response on an item is coded with a "1", indicating the presence of a preference on that item for the first pole or endpoint on the relevant dimension (Active, Sensing, Visual, or Sequential, depending on the dimension represented by the item in question). Each "b" response is coded with a "-1", marking a preference on that item for the second pole/endpoint on the relevant dimension (Reflective, Intuitive, Verbal, or Global).

For example, if a student answered with a "b" response on all 11 items on the *ILS* associated with the Active—Reflective dimension, they received a score of -11 on that particular mediating variable, indicating a strong preference for a Reflective learning style. Less extreme scores indicate less of a preference for one learning style over the other, on the given dimension of interest.

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For instance, a score of -1 on the Active—Reflective dimension signals the lack of a strong preference for one of those learning styles over the other, suggesting that the student was roughly equal in her/his preferences for Active vs. Reflective learning approaches. The sole *dependent variable* in the study—course grade— was entered in raw form as the numerical grade achieved by each student on a standard 4.0 scale (e.g., 3.33 = a B+, 3.67 = an A-, 4.0 = an A).

Model Construction and Data Analysis

To properly test for mediating effects of the learning style variables listed above, analyses were conducted in the manner prescribed by Baron and Kenny (1986). Regression equations were run to ascertain whether three conditions are met: 1) the independent variable affects the mediator, 2) the independent variable affects the dependent variable, and 3) the mediator affects the dependent variable. If the conditions are not met, there can be no mediating effect. However, if these conditions are indeed met, the dependent variable is regressed on both the independent and mediating variables.

According Baron and Kenny (1986), if we find the effect of the independent variable is less in the final regression equation than in the second, a mediating effect exists. Using this conservative approach ensures that mediator variables remaining in the model are significantly related to the independent variable and the dependent variable. If we find a significant effect of the independent variable on the dependent variable, we will then be able to run a stepwise, hierarchical regression analysis to test for significant mediating effects of the four learning style variables on the major-course grade relationship.

Results

All statistical tests were carried out at the .05 level of significance using the IBM SPSS 24.0 software package. Table 3 provides the descriptive statistics and correlations for the independent, control, mediating, and dependent variables.

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Table 3

Descriptive Statistics and Correlations for Study Variables (N = 84)

Table 3

Descriptive Statistics and Correlations for Study Variables (N = 84)

Variable 8	***M***	***SD***	1	2	3	4	5	6	7
1. Major (IV)	.62	.49	----						
2. Age (CV)	22.50	1.44	.07	----					
3. Gender (CV)		.49	.50	.12	-.04	----			
4. Active—Reflective *ILS* Dim. (MV)		2.14	4.35	.15	.09	-.17	----		
5. Sensing—Intuiting *ILS* Dim. (MV)		3.14	5.30	-.26*	-.10	.12	-.31**	----	
6. Visual—Verbal *ILS* Dim. (MV)	5.26	4.58	.36***	.06	.19	.44***	-.26*	----	
7. Sequential—Global *ILS* Dim. (MV)		1.76	4.39	-.05	.18	.11	-.26*	.31**	-.29** ----
8. Course Grade (DV)		3.64	.43	-.08	.07	.03	.06	.26*	-.09 .22*

Note: * $p < .05$. ** $p < .01$. *** $p < .001$.

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ISSN 2164-2885 (online)

Accounting and finance majors (coded as "0") comprised 32 of the 84 participants (38.10%). All other business majors (coded as "1") constituted 52 of the participants (69.10%). The mean for this dummy independent variable was 0.62 (*SD*= 0.49).

Two *control variables* were included in the model in order to rule them out as sources of undesired variation: age and gender. The mean age of students in the sample was 22.50 (*SD*= 1.44). Gender, the second control variable, yielded a mean of 0.49 (*SD*= .50), with 43 male students and 41 female students.

In accordance with the procedures outlined in Baron and Kenny (1986), we applied the three-step process to determine which learning style variables to retain in the final model for hypothesis testing. Table 4 presents the results of the regressions performed during this three-step test for mediation. As we noted earlier, if we obtain a significant effect for the independent variable on the dependent variable, we will then be able to run a stepwise, hierarchical regression analysis to test for significant mediating effects of the four learning style variables on the major-course grade relationship.

Table 4

Results of the Test for Mediating Variables

Model Construction Step 1: IV & CV → MV Regressions

IV	MV	Beta	*t*	Sig.
MAJOR	**ACT—REF**	.15	1.333	.186
	SEN—INT	-.26	-2.443	.017**
	VIS—VRB	.36	3.441	.001***
	SQL—GLB	-.05	-.412	.681
CV	**MV**	**Beta**	***t***	**Sig.**
AGE	**ACT—REF**	.09	.838	.419
	SEN—INT	-.10	-.947	.386
	VIS—VRB	.06	.481	.624
	SQL—GLB	.18	1.764	.093

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ISSN 2164-2885 (online)

Results for Step 1 of model construction— regressions of MAJOR (the *Independent Variable*) on the four learning style dimensions (the *Mediating Variables*)— show that MAJOR was significantly related to two of the four dimensions: Sensing—Intuiting (SEN—INT) and Visual—Verbal (VIS—VRB). Regressions of AGE and GENDER (the *Control* Variables) revealed no significant relationships among these variables and learning style.

The Step 1 results for MAJOR provide strong support for two of the four learning style dimensions, exactly in the directions predicted in Hypotheses 2 and 3. The significant negative relationship observed on the SEN--INT dimension in the step 1 phase of model construction confirms, as predicted, that management majors preferred an Intuitive learning style, while accounting and finance majors preferred a Sensing style.

In addition, the significant positive relationship found for the VIS—VRB dimension confirms our prediction that management majors will prefer a Visual learning style, while accounting and finance majors prefer a verbal style. These intriguing results show that accounting and finance majors will prefer the more fact-based (Sensing) and word-based (Verbal) approaches to learning as represented in the prototypical textbook format, while management majors will prefer more of a graphical focus (Visual) focused on helping them to learn by seeing new patterns of relationships in the world (Intuiting).

Moving to the second model construction step in the Baron and Kenny approach, Table 4 shows that we found no significant relationships when we regressed the independent variable on the dependent variable; by itself, MAJOR was not significant as a source of variation in course grades. In addition, we found no significant impacts of AGE and GENDER on course grades.

The good news is that the study was looking for no significant results on Hypotheses 1-4, providing evidence that a general business course incorporating elements supporting a diverse set of learning styles can level the playing field for earning course grades. In particular, we found that differences in learning styles revealed between Accounting and Finance majors and other business majors in the step 1 regressions did not translate into significant differences in grades earned in the capstone course.

The bad news revealed in Step 2 of the *model construction phase* is that finding no significant difference in course grades as a function of major means that we will not be able to proceed with the *model testing phase*.

Turning to the third and final step in model construction, we regressed the four learning style mediating variables on the dependent variable and found that two of the four mediators were significantly related to the dependent variable, shown in the lower portion of Table 4. Both the SEN—INT and the SQL—GLB dimensions were positively related to GRADE, meaning that students preferring the Sensing and Sequential learning styles achieved higher course grades.

ISSN 2164-2877 (print)
ISSN 2164-2885 (online)

In summary, the three-step *model construction phase* of data analysis showed that one of the four learning style mediators (Sensing—Intuiting) had qualified for use with the independent variable (MAJOR) in the model testing phase, with significant impacts in steps 1 and 3. However, since the second step of the model construction phase revealed no significant relationship among MAJOR and COURSE GRADES, following Baron and Kenny's (1986) procedures we have no sound psychometric basis for continuing the analysis to the *model testing phase* for mediating effects using a stepwise regression approach.

Conclusions and Implications

This study makes an important contribution to the growing body of research on the use of the *ILS* as a means of identifying patterns in learning style preferences associated with different majors at post-secondary institutions of higher learning. More specifically, we succeeded in documenting some key truths behind the myth of bookish accounting and finance majors. In particular, our results show that accounting and finance majors are more 'bookish' insofar as they displayed a significant preference for a more Reflective, Sensing, Verbal, and Sequential learning style. Other business majors, on the other hand, preferred a more Active, Intuitive, Visual, and Global learning style.

Following the advice of Felder and Spurlin (2005), the researcher will apply the results to practice through communicating the findings with the instructor of the course involved in the study. Knowledge of this sort will play an increasingly important role as the instructor works to ensure that course activities remain focused on addressing the full range of diverse learning styles in an era offering a veritable explosion of new pedagogical technologies, from online resources to podcasts, from blogs to 'twittering', and beyond. Similar rich implications exist for department chairs, program heads, and other administrators charged with designing and implementing effective learning approaches in the 21st Century.

Felder and Spurlin (2005) highlight a second set of key implications of *ILS*-based research for practice: communicating the results with student participants can help them attain a greater awareness of their own learning style preferences, as well as those expressed by other individuals and other groups of individuals (including other majors). Greater insight into the strengths, weaknesses, and precise nature of one's learning style preferences can yield deeper levels of understanding regarding which courses, parts of courses, and teaching approaches provide better and worse fits with one's own style of learning.

Another crucial implication of the study is that sometimes a failure to reject the null hypothesis is exactly what one should be hoping for, as in the case of our finding of no significant differences in course grades as a function of major. Although we did find evidence for some truth to the perception that accounting and finance majors are more 'bookish' vis-à-vis their learning style preferences, we failed to find proof that these majors earned higher grades in a general business class not focused on any one major: the capstone business course.

ISSN 2164-2877 (print)
ISSN 2164-2885 (online)

The success in busting this myth is good news for the instructor of the course involved in our study, as the capstone course is expressly focused on including and integrating all functional areas into the analysis, decision-making, and planning efforts of a firm's ongoing operations. This curricular design was intentional, providing students with a varied menu of learning modalities targeting the full range of learning styles (Karns, 2006).

Ideally, this approach equips instructors with an expanded learning delivery toolkit, helping them reduce cognitive misfits among learning styles and tasks, enhancing learning outcomes as a result (Honn & Ugrin, 2012). Prior research supports this thesis, confirming that a 'smorgasbord' approach can indeed level the playing field so that learning style differences are no longer a source of advantage or disadvantage in course performance (Ng, Pinto & Williams, 2011).

The study lends additional credence to this curricular design strategy, especially when diverse sets of majors are required to take the same core course within a broader program of learning, and when educators are charged with designing and implementing effective course curricula addressing the diverse learning preferences that students bring to real and virtual classrooms in the 21st Century (Al-Omari, Carter & Chiclana, 2016; Coffield, Mosely, Hall & Ecclestone, 2004; Hayes & Allinson, 1996; Yang, Hwang & Yang, 2013.)

This study raises some intriguing implications for future research utilizing the *ILS* instrument. Additional studies should examine the potential impacts of the amount of studying and nature of studying on course grades. Measures of the latter could readily be developed by translating the defining endpoints or poles of the four *ILS* learning style dimensions into different types of study activities associated with or supporting the different endpoints (types of activities associated with Active learning, Reflective learning, etc.)

Future research should not overlook potential differences in learning style preferences arising from cross-cultural factors. Valuable nuggets of insight await further studies focused on mining the potentially rich connections between the *ILS* and validated approaches for measuring cross-cultural differences, including work by Triandis (1994) and Hofstede's (1984) renowned 'work-related values differences' focusing on four dimensions: *individualism/collectivism, masculinity, power distance,* and *uncertainty avoidance.*

The above implications for future research and practice highlight several inherent limitations of our study, however. First and foremost, our findings are limited by the fact that our study relied on a sample drawn exclusively from a population of undergraduate business students enrolled at a medium-sized Midwestern university. Drawing samples from other populations of learners– different majors at the undergraduate level, students from other types of secondary and post-secondary schools, in other regions of the country and the world, and samples from different types of work-related environments– will help future studies examine the generalizability and ecological validity of our findings.

ISSN 2164-2877 (print)
ISSN 2164-2885 (online)

A second set of limitations derives from inherent constraints in the nature and scope of single research studies. This study was focused on: (a) examining impacts of learning style differences on course grades in a capstone general business class, and (b) documenting systematic differences in learning styles by major. Although the curricular design strategy in this capstone course provided students with access to a varied menu of learning modalities, targeting the full range of learning style preferences (Karns, 2006), we did not investigate impacts of learning styles on a more granular performance level. Future studies are needed to unpack the impacts of learning styles on specific tasks and outcomes when a menu-based curricular approach is deployed, tracking the amount and nature of study and task activities.

In conclusion, the study adds significant value to the existing literature by using the *ILS* to document that different business majors do indeed hold different learning style preferences. In particular, we succeeded in revealing some truth behind the myth of the bookish accounting major. The researcher also succeeded in 'busting the myth' that bookish accounting and finance majors earn higher grades than other business majors, in a general business course.

By so doing, this study provides a useful example of how *ILS*-based research can inform practice through generating valuable information regarding the different learning styles that students bring to their classes and how an intentional and expressed desire to design and implement a course addressing the full range of learning styles can promote successful learning regardless of one's preferred learning style. Expanding this research to additional learning contexts– including samples drawn from secondary schools, graduate schools, technical schools, work-related learning programs, and other post-secondary schools– will yield further insights as we contribute to the growing body of research on the nature and impacts of different learning styles in the 21st Century.

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ISSN 2164-2877 (print)
ISSN 2164-2885 (online)

Management Strategies for Active Learning in AACSB accredited STEM discipline of CIS: Evidence from Traditional and Novel Didactic Methods in Higher Education

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ABSTRACT

The positive influence of active learning methods for Higher Education is widely studied and is well documented in the research literature. However, there is very little research on active learning impact on Association to Advance Collegiate Schools of Business (AACSB) accredited business programs which include a Science, Technology, Engineering, Mathematics (STEM) discipline such as Computer Information Systems (CIS) with very diverse student population demographics. For this study, the researchers focus on campus-level data particularly how active learning influences student learning in introductory College of Business computer information systems courses focused on information technology for management. In this study, the researchers investigate whether a relationship exists between the method of learning and the student reactions to instruction and courses. The survey instrument of choice for eliciting student feedback is the Individual Development and Educational Assessment (IDEA) and the time period that the surveys have been collected and analyzed is more than a decade about 12 academic years, 35 academic courses for traditional learning, and 37 academic courses for active learning. The results of the statistical analysis indicate that there is a significant positive impact for the student feedback reported with active learning methods compared to significantly lower results reported with traditional learning. The results provide important information to practitioners, researchers and educators on the positive impact of active learning methods on AACSB accredited business programs which include a STEM discipline such as computer information systems with very diverse student population demographics.

Keywords: active learning

Introduction

In this study, the researchers focus on the influence of active learning in comparison to traditional learning on the student learning outcomes of Association to Advance Collegiate Schools of Business *(AACSB)* accredited business higher education Science, Technology, Engineering, Mathematics, Medicine

ISSN 2164-2877 (print)
ISSN 2164-2885 (online)

(STEMM) courses. For this study, the focus on campus-level data, particularly how active learning influences student learning in introductory College of Business computer information systems courses focused on information technology for management. In this study, the researchers investigate whether a relationship exists between the method of learning and the student reactions to instruction and courses. Data of *IDEA* evaluations are drawn from over a decade, about 12 academic years, 35 academic semesters for traditional learning and 37 academic semesters for active learning. All these *IDEA* evaluations are analyzed with statistical methods such as t-tests and bootstraps. Results indicate a higher student satisfaction and higher student evaluations from the *IDEA* instrument are statistically significant when active learning teaching methods are employed. The influence of active learning on student engagement and learning indicators is well documented in the research literature, but there is very little evidence on long-term, about 12 academic years, information technology enhanced active learning methods and their effects on learning outcomes for business higher education level courses. The *STEMM* course Introduction to Computer Information Systems for which the students provided their feedback is part of the College of Business curriculum at California State University Stanislaus which is *AACSB* accredited.

Literature Review

In the available research literature, there are many studies which cover the traditional teaching and learning methods and their effects on the achievement of course learning objectives in traditional learning settings (Brockliss, 1996). Traditional learning is the lecture style delivery of information, which enforces a one way communication where the students passively receive information from the instructor (Piaget, 1926; Vygotsky, 1978). Also, traditional learning relies primarily on the teacher lecturing from a podium down to the crowd, a scenario which may cause—after the first 10-15 minutes—student attention decline and may lead to complete absence of student concentration (Bligh, 2000). Freeman et al. (2014) report research results that active learning increases student performance in science, technology, engineering and mathematics STEM. In contrast to traditional learning, in active learning a two-way communication is necessary between the teacher and the students to engage in the learning process (Pintrich, McKeachie, & Lin, 1987). The teacher facilitates the learning process by providing real world scenarios whereby the students learn by example and construct their own knowledge utilizing scientific evidence (Handelsman et al., 2004).

In the research literature, numerous studies provide scientific evidence which indicate information retention and student learning satisfaction is increased during interactive learning sessions compared to traditional 50 minutes' lectures (Hake 1998; Springer, Stanne, & Donovan, 1999; Knight & Wood 2005). Large class sizes (greater than 40 students) may inhibit and constrain the deployment of active learning strategies. In business schools where professors often utilize the Harvard business case study approach to engage the students in the learning discussion the most effective way to learn in larger classes is to create small groups of up to five students and engage in the class discussion activities one group at a time (Heppner, 2007; Stanley & Porter, 2002; Weimer, 1987). Higher education is dominated by traditional learning and it is no wonder that students perceive some disciplines (for example science,

ISSN 2164-2877 (print)
ISSN 2164-2885 (online)

technology, engineering, math, medicine, *STEMM*) as difficult, hard to understand, unapproachable and prefer to shy away from studying these fields. Unfortunately, the same facts are verified by the very high failure, attrition rates and low degree graduation rates in STEMM disciplines of Higher Education (Chen, 2013). Jensen, Kummer, and Godoy (2015) report that when an active-learning, constructivist approach is utilized in flipped and non-flipped classrooms higher learning gains or better attitudes are most likely a result of the active-learning style of instruction rather than the order in which the instructor participated in the learning process. Baepler, Walker and Driessen (2014) report that using an active learning classroom, seat time can be cut by two-thirds and achieve the same outcomes, original findings are confirmed with a second follow-up study, both studies use a standardized exam to measure learning outcomes and student perceptions of the active learning classroom are more favorable. Ruest, Svoboda, and Opperman (2017) report from their dental education research study that the students indicate that active learning activities like crossword puzzles could be an effective adjunct to a flipped classroom self-learning model.

Active teaching and learning methods

In order for active learning to be effective, some preparation (material and psychological) is required from the teacher facilitator. Instead of the teacher lecturing the students, the role is to facilitate, interact with learners and guide them step-by-step through the learning process. In this active teaching and learning paradigm a facilitating approach is for the teacher to consider the class as a group of junior colleagues with whom to collaborate and mentors them with great respect. Based on this strategy the teacher-facilitator is enabled to form a bond enhanced by the learning interaction with the students. This approach also allows the teacher-facilitator to build mutual trust and respect with learners. Active learning also enables the teacher to be a facilitator rather than a supervisor and allows the ability to approach students as a learning resource instead of their superior. This approach allows student-to-teacher and peer-to-peer interaction engaging students in the learning process with open communication so that they feel comfortable coming to the teacher for questions and educational guidance. Active learning approach also provides an open learning environment with mutual respect and satisfaction for the facilitator as well as for the students. The facilitator is able to achieve fulfilment in teaching by helping the students learn new knowledge, or a novel skill that will be useful to them in their higher education and ultimately their careers and the students feel satisfaction with their new knowledge and reflect it in their *IDEA* survey responses. For a teacher facilitator, the leading purpose is to coach the students and facilitate them throughout the learning process by receiving their feedback and adjusting the teaching approach to achieve their learning objectives. Student engagement in the learning process is achieved by motivating them to actively participate and get involved in their daily learning activities utilizing novel technologies such as information technology enhanced training, computing simulations, hands on IT labs, creating and practicing interactive computing models and collaborating on modern business case studies. For example, for the STEM course Introduction to Computer Information Systems as part of their active teaching and learning students engage with interactive computing labs using Cengage's Skills Assessment Management software learning platform.

ISSN 2164-2877 (print)
ISSN 2164-2885 (online)

Next is an example of Microsoft Access Database tasks completed for Module 1: Project 1 a. Project Report Description: The following provides a brief description and list of fields for available Project Reports. Frequency Analysis by Project displays performance results for each project task (step number) for the section as a whole. Note that total students equals 12 while the total completed times for Steps 1 are 7 (full credit) + 9 (no credit) equals 16. This is due to the fact that each student is allowed to complete the whole project up to three times to improve their grade. For example, if a student the first time receives 50% and wishes to improve it, he/she can redo the whole project and receive 70% and if he/she wishes to further improve it, he/she can redo the whole project and receive 80%. Full credit is for completing correctly all the activities for a step otherwise student is given no credit.

Table 1
Sample Microsoft Access Database Tasks List

Step Number	Description Text	Activities	FC	NC
1	Create a new table in Datasheet View with the following options: (a) Rename the default primary key ID field State and change the data type to Short Text. (Hint: State should remain the primary key). (b) Change the field size of the State field to 2. (c) Add a new field with the name StateName and the Short Text data type. Save the table with the name States, but do not close it.	Set a field's field size property in Table Datasheet view. Add a field to a table in Table Datasheet view. Create a table in Table Datasheet view. Rename a field in Table Datasheet view. CLT.	7	9
2	With the States table still open in Datasheet View, add the four records shown in Table 1 in the Instruction file. If necessary, resize the StateName field so that all field values are completely visible. Save and close the States table.	Enter a record into a table. CLT.	10	6
3	Open the AdRep table in Datasheet View. Add a new field following the PostalCode field with the field name DateHired and the Date and Time data type. Close the table.	Add a field to a table in Table Datasheet view. CLT.	15	1
4	Open the Billboard table in Design View and make the following changes to the Height field: (a) Change the data type from Short Text to Number. (b) Change the Field Size property to Single. (c) Change the Decimal Places property from Auto to 1.	Set a field's data type in Table Design view. Set a field's field size property in Table Design view. Set a field's Decimal Place property in Design view. CLT.	14	2
5	With the Billboard table still open in Design View, add Daily Effective Circulation as the Description (Optional) to the DEC field.	Add a description to a field in Table Design view. CLT.	13	3
6	With the Billboard table still open in Design View, change the field size property for the Location field to 75. Save the changes to the Billboard table, and then close it. (Hint: Because there were changes to data types and field sizes, the “Some data may be lost”	Set a field's field size property in Table Design view. CLT.	14	2

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Step Number	Description Text	Activities	FC	NC
	warning message appears. The data fits within the valid ranges, so ignore this message and continue saving the table).			
7	Import the data from the Excel support file Support_SC_AC16_1a_Advertiser.xlsx, available for download from the SAM website. Append the records to the Advertiser table. Do not create a new table, and do not save the import steps.	Import data from an Excel workbook into an existing table. CLT.	10	6
8	Open the Advertiser table in Design View and make the following changes to the AdvertiserID field: (a) Make the field the primary key. (b) Change the Caption property to AdvID. (Hint: Do not type the period). Save the changes to the Advertiser table, and then close the table.	Set a table's primary key in Design view. Set a field's caption property in Table Design view. CLT.	14	2
9	Open the Billboard table in Datasheet View, navigate to the third record (which has a BbrdID field value of LHBU01), and then enter Poster for the Type field value. Navigate to the previous record (which has a BbrdID field value of LHBE01) and enter Digital for the Type field value. Close the table.	Set a field's data type in Table Datasheet view. CLT.	15	1
10	Open the Billboard Listing Query in Design View, and then add a criterion to select only those records with a State field value of WA. Run the query, and then save and close the query.	Add a criterion to a Short Text field to a query in Design view. CLT.	14	2
11	Use the Simple Query Wizard to create a query based on the Advertiser table with the following options: (a) Include all fields from the Advertiser table in the query. (b) Save the query with the name Advertiser Query (which is the default name) and close it, if necessary.	CLT.	12	4
12	Create a simple form for the Advertiser table. Save the form as Advertiser Form, and then close the form. (Hint: Use the Form button to create this form).	Create a form using the Form tool. CLT.	6	10
13	Open the AdRep Update Form in Form View and navigate to the third record, which has the AdRepNumber field value of KS02. Change the Address field value for this record to 90 Mesa Verde St., and then close the AdRep Update Form.	Edit a record using a form. CLT.	12	4
14	Create a simple report based on the Advertiser table. Save the report as Advertiser Report, and then close the report.	Create a report using the Report tool. CLT.	8	8
15	Open the Idaho Wyoming Billboard Circulation report in Layout View, and then modify the report to match the figure in the Instruction file by following these	Change the document properties. Edit the text in a label in Report Layout view. Resize a control in	6	10

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Step Number	Description Text	Activities	FC	NC
	directions: (a) Delete the Type and Facing columns. (b) Change the column heading for the BbrdID column and the DEC column to the headings shown in the figure. (c) Sum the values in the DEC column. If necessary, expand the size of the total control so it displays completely. (d) Change the report title from "Idaho Wyoming Billboards" to Idaho Wyoming Billboard Circulation. (Hint: Do not type the period. Your report may display a different date and time than what is shown in the figure).	Report Layout view. Add totals to a report column in Report Layout view. Delete a control in Report Design view. CLT.		

As part of their active teaching and learning students are coached one-on-one by their teacher-facilitator how to complete the Modules for Microsoft Access Database by implementing six projects of 15 to 25 tasks each. In addition to re-working the solution of a similar project in class, the student at any time can always consult the comprehensive lab training which is always available online demonstrating an interactive computer screen recording for each step of the project. Active learning is a standard adopted by the Association to Advance Collegiate Schools of Business AACSB accreditation organization.

Research methodology

Originality and relevance to the field of this study is the contribution of the effects of active learning on *AACSB* accredited business program which includes a *STEMM* discipline like computer information systems with very diverse student population demographics. The positive influence of active learning methods for higher education is widely studied and is well documented in the research literature. However, there is very little research on active learning impact on *AACSB* accredited business programs which include a *STEMM* discipline such as computer information systems. For this study, the focus is on campus-level data particularly how active learning influences student learning in introductory College of Business computer information systems courses focused on information technology for management. In this study, the researchers investigate whether a relationship exists between the method of learning and the student reactions to instruction and courses. The survey instrument of choice for eliciting student feedback is *IDEA* and the time period that the surveys have been collected and analyzed is more than a decade about 12 academic years, 35 academic semesters for traditional learning and 37 academic semesters for active learning. Linse (2017) reports that when evaluating student ratings over a long time period individual courses with low scores are less important than patterns of consistent high score results. Therefore in this research study it is important to distinguish the teaching method which exhibits a pattern over a long time period with consistent low or high scores. *IDEA* is a nonprofit organization which provides analytics, resources, and advice to improve student learning in higher education. The Individual Development & Educational Assessment (*IDEA*) Student Ratings of Instruction System originated at Kansas State University during the 1968-69 academic year with a unique emphasis to provide constructive feedback to improve the quality of teaching and student learning. During the next

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ISSN 2164-2885 (online)

seven years, the system was perfected and refined to assist in the improvement of instruction at Kansas State University. With help from the W. K. Kellogg Foundation, the *IDEA* Center was established in 1975 and the *IDEA* Student Ratings system was made available to other colleges and universities. More than 40 years of research in refined feedback instruments and collaboration with more than 300 Universities in the US provide critical insight to guide personal and programmatic reflection. The *IDEA* survey utilized in this study has a Likert scale (1 no apparent progress, 2 slight progress, 3 moderate progress, 4 substantial progress, 5 exceptional progress) for questions 1-12 to gather the self-assessment of the student´s actual learning progress and a Likert scale (1 definitely false, 2 more false than true, 3 in between, 4 more true than false, 5 definitely true) for questions 13-18 to measure student's attitudes and feelings for the teacher, the course and the field of study.

Statistics analysis

The research question is, does the teaching method make a difference to the *IDEA* survey results of a very diverse University student population for a *STEMM* computer information systems course of an *AACSB* accredited program? The research hypothesis is that active learning enhances teaching and student learning, creates positive impact on self-assessment of the student´s actual learning progress and on student's attitudes and feelings for the teacher, the course and the field of study. The statistical analysis is transparent and contains e.g. t-tests and bootstraps. The focus of this study is on the influence of active learning in comparison to traditional learning on the student learning outcomes of *AACSB* accredited business higher education *STEMM* courses. For this study, the researchers focus on campus-level data particularly how active learning influences student learning in introductory College of Business computer information systems courses focused on information technology for management. In this study, the researchers investigate whether a relationship exists between the method of learning and the student reactions to instruction and courses. Data of *IDEA* evaluations are drawn from over a decade, about 12 academic years, 35 academic semesters for Traditional Learning *TL* and 37 academic semesters for Active Learning *AL*. Data collection took place at California State University Stanislaus over a time period that spans over a decade approximately 12 years from spring semester 2004 to winter inter-session 2016. A total of 35+37=72 academic semester class sections with average 30 students each or N=2,160 students total participated in the study. Each of the N=2,160 students has completed an *IDEA* survey. Two experimental conditions are employed for teaching method traditional and active learning. For the experimental condition, traditional learning 35 academic semester class sections participated and for the active learning 37 academic semester class sections participated.

Sample population

The demographics of the University student population for 2016 are 6,422 (66%) female, 3,340 (34%) male, 4,840 (50%) Hispanic or Latino which designates the University as Hispanic serving Institution (CSU, 2018a). The business course for which the students have provided their feedback is introduction to computer information systems.

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Table 2
Introduction to Computer Information Systems Demographics, 2016

University Student Population distribution by race, ethnicity, residency status 2016	
American Indian or Alaskan Native	33 (0.3%)
Asian	973 (10%)
Black or African American	218 (2%)
Hispanic or Latino	4,840 (50%)
Native Hawaiian or other Pacific Islander	48 (0.5%)
Nonresident Alien	320 (3%)
Unknown, not responded	549 (6%)
Two or more races	384 (4%)
White	2,397 (25%)

The vast majority, more than 98%, of the students who took this course were first-time freshman business students with an average age of 18-years old and the next significantly smaller group is mature students at an older age than first-time freshman students. Another important characteristic of the sample population is that the vast majority of the students are first generation college students. Nearly 80% of first-time freshmen are first-generation college students. Another significant fact is that the student to faculty ratio is 20:1 which allows for a more engaging learning experience and plays an important role in active learning teaching and learning methods. The course description is the following. "Students learn current information technologies for business applications including hardware and software concepts, components and their integration into business applications. In addition to discovering current information technologies, the student is introduced to word processing, spreadsheet, database, business presentation and Internet applications. The labs are created to satisfy the requirements for training on the Microsoft Office Specialist certifications for word processing, worksheet, database and business presentation applications" (CSU, 2018b).

ISSN 2164-2877 (print)
ISSN 2164-2885 (online)

Table 3

IDEA survey instrument questions utilized to elicit student feedback

IDEA survey form - student reactions to instruction and courses progress on:
Gaining factual knowledge (terminology, classifications, methods, trends).
Learning fundamental principles, generalizations or theories.
Learning to apply material (to improve thinking, problem solving, and decisions).
Developing Skills, competencies, and points of View needed by professionals in the field most closely related to this course.
Acquiring skills in working with others as a member of a team.
Developing creative capacities (writing, inventing, designing, performing in art, music, drama, etc.).
Gaining a broader understanding and appreciation of intellectual, cultural activity (music, science, literature. etc.).
Developing skill in expressing myself orally or in writing.
Learning how to find and use resources for answering questions or solving problems.
Developing a clearer understanding of, and commitment to, personal values.
Learning to analyze and critically evaluate ideas, arguments, and points of view.
Acquiring an interest in learning more by asking my own questions and seeking answers.
As a rule, I put forth more effort than other students on academic work.
My background prepared me well for this course's requirements.
I really wanted to take this course regardless who taught it.
As a result of taking this course, I have more positive feelings toward thig field of study.
Overall, I rate this instructor an excellent teacher.
Overall, I rate this course as excellent.

For the next diagram the *IDEA* survey questions are noted on the horizontal X axis Q1=2, Q2=3, Q3=4,…Q18=19 and the teaching method is indicated by symbols (○/□) for TL/AL. Traditional Learning is TL (○) and Active Learning is AL (□). The academic semesters' *IDEA* survey mean values are from spring 2004 to winter 2016. The Y axis displays the mean values for TL (○) and AL (□).

ISSN 2164-2877 (print)
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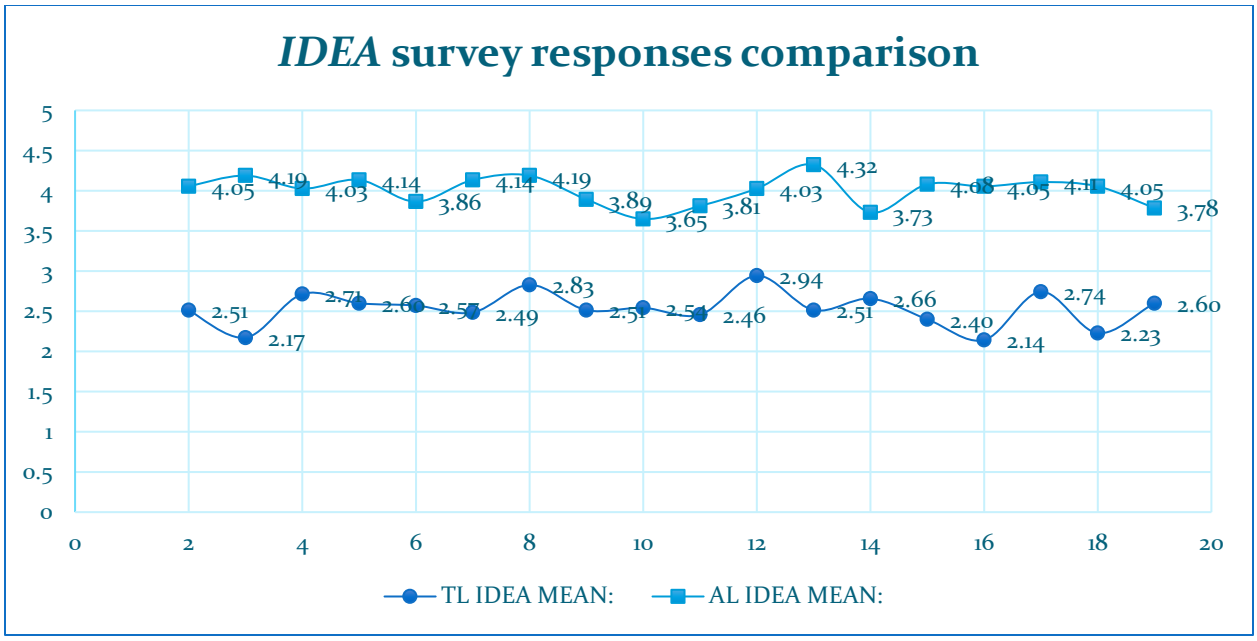

Figure 1. IDEA survey responses comparison of Traditional Learning and Active Learning.

For statistical analysis of the data, *IBM SPSS* was used. The null hypothesis always assumes that the *IDEA* Active Learning and Traditional Learning means are equal. The t-statistic tests the null hypothesis and will indicate if the difference of the two means is different from zero (Pituch, Whittaker, & Stevens, 2015). Comparison of the differences of the means of two groups is the same as utilizing the membership of the two groups to predict an outcome (Lowry, 2014). Cohen (1968) demonstrated that a linear model is utilized when two means are compared. Therefore, this is a regression with one dichotomous predictor utilizing a linear model (Urdan, 2016). For example, the model predicts the student responses on the excellence of the course from whether or not a student participated in active learning (Anderson, Sweeney, Williams, Camm, & Cochran, 2014). Also, Figure 1 indicates that there is a significant difference between active learning and traditional learning means (Lim & Lim, 2016). The independent samples t-test is utilized when there are two experimental conditions—traditional and active learning—and different students participated in the course taught with each condition (Morgan, Reichert, & Harrison, 2016). To run an independent t-test the dependent variable Q18 was selected from the list and assign it to Test Variable(s). Next, the independent variable Teaching Method, which designates the groups traditional learning and active learning, was selected and assigned to Grouping Variable. Then, groups with the numeric codes were assigned to designate the two groups. In this case traditional learning is 1 and active learning is 2. Next, the confidence interval was designated at 95% which is adequately high for this analysis. Next, bootstrapping is utilized to decrease the impact of potential bias in the data and to get a bias corrected and accelerated 95% confidence interval. Last, the survey was deployed.

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Table 4
Group Statistics

Teaching Method		Bootstrap results are based on 1,000 bootstrap samples			
Traditional Learning=1.0	Statistic	Bias	Std. Error	Lower BCa 95% Confidence Interval	Upper BCa 95% Confidence Interval
N	35				
Mean	2.600	-.009	.199	2.218	2.972
Std. Deviation	1.193	-.0207	.0794	1.0582	1.2833
Std. Error Mean	.2017				
Active Learning=2.0					
N	37				
Mean	3.784	-.006	.129	3.555	4.000
Std. Deviation	.7865	-.0123	.0589	.6840	.8588
Std. Error Mean	.1293				

In the above Table 4, a summary is provided for the two experimental conditions. The reader can understand from this table that the traditional learning group has 35 class sections participating and the active learning group has 37 class sections participating, numbers are indicated on the right of N. The group of traditional learning on average rated 2.6 on a scale of 5 as an excellent course, with a standard deviation of 1.1931. In addition the standard error of that group is 0.2017. The bootstrap standard error estimate is 0.199 and the bootstrapped confidence interval for the mean has a lower value of 2.218 and upper value of 2.972. The group of active learning on average rated 3.784 out of 5 as an excellent course, with a standard deviation 0.7865 and a standard error of 0.1293, lower than the TL group. The bootstrap standard error is 0.129 lower than TL group and the confidence interval for the mean has a lower value of 3.555 and upper value of 4.

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Table 5
Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Diff.	Std. Error Diff.	Lower 95% Confidence Interval of the Diff.	Upper 95% Confidence Interval of the Diff.
Equal variances assumed	13.206	.001	-4.997	70	.000	-1.1838	.2369	-1.6563	-.7113
Equal variances not assumed			-4.941	58.381	.000	-1.1838	.2396	-1.6633	-.7043

In the above Table 5 , the main test statistics are presented. The test statistics values are displayed in two different rows titled Equal variances assumed and not assumed. In order to determine if the variances in experimental groups are approximately equal, which is assumed by parametric tests, Levene's test is performed to see if this assumption is broken or not. Hence Levene's test puts to the test the hypothesis that the difference of the two variances is zero and the two group variances are equal. If Levene's test is not significant p>0.05 then the variances are assumed approximately equal and the hypothesis is acceptable. If Levene's test is significant p<=0.05 then the assumption of homogeneousness of variances is violated and the hypothesis is not acceptable. In this case Levene's test is significant p=0.001 which is less than 0.05. Hence the test statistics are acceptable from the row titled Equal variances not assumed. Examining the t-test for equality of means the standard error difference is 0.2396, the mean difference is -1.1838 and the t-statistic is equal to the mean difference divided by the standard error difference, t=-4.941. This t value is assessed compared to the expected t-value with no effect in the population and with degrees of freedom 58.381. The significance of the t-test is assessed by if it is greater or less than p=0.05. For this case the two tailed value of p=0.000007 which is less than 0.05 and hence the t-test finds a significant difference between the means of these two groups. If the same test is run as a regression then the values of the t-test and significance are the same. The direction (positive or negative sign) of the correlation coefficient of a dichotomous variable depends on which cases are assigned to which groups. The positive or negative sign (direction) of the t-test value depends upon which group is selected as the base category (the category designated as 1=Traditional Learning). Hence one of the important results of the experiment is that active learning=2 significantly affects the students' assessment of the excellence and quality of the course.

ISSN 2164-2877 (print)
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Table 6
Bootstrap for Independent Samples Test

	Mean Difference	Bootstrap results are based on 1,000 bootstrap samples				
		Bias	Std. Error	Sig. (2-tailed)	Lower BCa 95% Confidence Interval	Upper BCa 95% Confidence Interval
Equal variances assumed	-1.1838	-.0025	.2364	.001	-1.6840	-.7493
Equal variances not assumed	-1.1838	-.0025	.2364	.001	-1.6840	-.7493

Table 6 presents the results of bootstrapping procedure. The mean difference standard error value is re-computed and is equal to 0.2364 which is lower than the prior value of 0.2396. The bootstrapped computed confidence interval is -1.6840 to -0.7493 for the difference between means -1.1838. The bootstrap confidence interval indicates that the mean difference for the two population groups is negative and cannot be zero i.e. significant difference between the two population groups. Hence this bootstrap confidence interval confirms the conclusion that active learning seems to affect the assessment of students regarding the quality and excellence of the course.

Future work and limitations of the study

Limitations of this study are that the results pertain to a specific region the central valley of California and to a specific diverse demographics of the university student population. In addition to the diverse demographics with high concentration of Hispanic university student population the study included only small size classes of about thirty students. According to research literature, small class size improves quality of student learning. Another limitation of the study included focus on a specific campus in a specific location in the central valley of California. Nevertheless, these limitations may be balanced by other independent studies which have performed similar experiments on a broader university student population sample in other parts of North and South America, Europe, Middle East, Asia, Africa, Australia and have reached the same positive findings. Numerous independent research studies have reached similar positive results about active learning and are in agreement with the findings of the current study which are independently verified and confirmed. The contribution of this work to the university business faculty and students is therefore confirmed by the experiments of this and other independent international studies which reaffirm the positive influence of active learning. Future work will focus on individual student learning objectives and how they are influenced over time by active learning strategies.

ISSN 2164-2877 (print)
ISSN 2164-2885 (online)

Conclusion

In this study, the investigation was whether there is a relationship between teaching methodology and student assessment of excellence of the course and how the means of the student assessments compare for two independent groups who participate in traditional lecturing and active learning. Our results reveal that there appears to be a significant difference between traditional lecturing and active learning, as to how the students respond to standard *IDEA* survey for achieving their learning objectives. Results indicate that there is a relatively immediate statistically significant impact of active learning on the excellence and quality of the taught course. This finding is consistent with the research literature that active learning strategies are more efficient and information is absorbed and retained more effectively for active learning participants compared to students subjected to the traditional lecturing.

Hence one of the important results of this study is that active learning meaningfully affects in a positive and significant way the students' assessment of the excellence and quality of the course. There are numerous implications for practice and policy for higher education institutions especially business schools with a *STEMM* discipline which aspire to be or already are *AACSB* accredited. It is an advantage for higher education institutions to include active learning activities for their business programs to enhance teaching and to enrich student learning experiences.

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ISSN 2164-2877 (print)
ISSN 2164-2885 (online)

Providing Entrepreneurship Education to Business and Non-Business Students: A Holistic View on Different Approaches

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Abstract

Entrepreneurship education has developed to a field of great significance, since a thoroughly carried out entrepreneurship education might serve as catalyst to enable economic growth and sustainable development. This paper follows a broad understanding of entrepreneurship education and concentrates on entrepreneurship education at universities. Several strategies to foster entrepreneurship and entrepreneurial spirit are introduced and didactical possibilities are presented by practical examples, such as business simulations and the project TIMEGATE. Finally, consequences and limitations of teaching entrepreneurship with a special focus on interest profiles of business teachers are discussed critically. As a practical implication, it becomes apparent that measures of entrepreneurship education require accurate reconcilement of didactical aims, teaching methods and assessment. Additional measures such as the introduction of role models can provide another contribution to foster entrepreneurship education within the classroom.

Keywords: Entrepreneurship education, economic growth, sustainable development

Introduction

Entrepreneurs play an important role in the innovation process of modern economies. According to the European Commission (2013, pp. 5–8), the key competence `entrepreneurship´ should be embedded into curricula across primary, secondary, vocational, higher and adult education. The term 'entrepreneur' goes beyond founding new enterprises and being an employer. It includes all kinds of innovative economic activities under uncertainty. Entrepreneurship is not a specific personality trait inherent to successful entrepreneurs, but entrepreneurship may be attributed to entrepreneurs' behavior (Drucker, 2002, pp. 21–26). Entrepreneurship, in this sense, is considered as teachable and learnable, thus „everyone who can face up to decision making can learn to be an entrepreneur and to behave entrepreneurially" (Drucker, 2002, p. 26). This raises the dominant question, in which didactical settings entrepreneurship education might contribute to the learning processes of future entrepreneurs.

ISSN 2164-2877 (print)
ISSN 2164-2885 (online)

In literature, there is a broad consensus that measures of entrepreneurship education show a positive impact on learners' intention towards becoming an entrepreneur (as illustrated within the reviews of Bae, Qian, Miao, & Fiet, 2014; Gorman, Hanlon, & King, 1997). As a result of this learning process students might develop a more realistic view on their entrepreneurial skill set which, in turn, can lead to a negative impact of entrepreneurship education, namely on students' intention to found an enterprise (Oosterbeek, van Praag, & Ijsselstein, 2010). Nevertheless, entrepreneurship education is considered to have a favorable influence on personality traits relevant to start-ups (Bae et al., 2014).

Given the wide range of possible measures to conduct entrepreneurship education within the classroom (e.g. business simulations, case studies, project-based learning, role plays; see also Riebenbauer & Köppel, 2009, p. 86) and the wide range of possible recipients (e.g. students of business and non-business students), entrepreneurship education offers a multitude of potential didactical settings. The aim of this research is to display how entrepreneurship might be taught effectively to both business students and students of other disciplines and to discuss challenges for teaching entrepreneurship education specifically for teachers of business education.

The research follows a compiled methodology by combining existing methods to conduct entrepreneurship education with findings regarding the teachers' interest profiles. However, providing an in-depth analysis of potential didactical settings or a checklist of recommendations for in-classroom-actions is beyond the scope of this paper. Instead, the aim of this paper is to add another perspective to the ongoing literary discourse by focusing specifically on the person of the teacher and challenges for teaching entrepreneurship education. For this purpose, four forms of autonomy are identified as main goals of entrepreneurship education (Tramm & Gramlinger, 2006) as well as necessary entrepreneurial qualities (Casson, 2003) and their capability of enhancement. Subsequently, different strategies of implementing entrepreneurship education on an institutional and supra-institutional level are discussed. Two teaching and learning settings for conducting entrepreneurship education are presented in detail: (1) The first setting focuses on how business simulations might be utilized to conduct entrepreneurship education especially for business students. (2) The second setting broadens this perspective by including non-business students, with a special focus on training at university level. Considering the dominant role of the teacher in facilitating learning processes (Hattie, 2010), challenges for teaching entrepreneurship are derived by using the RIASEC model to analyze (prospective) business teachers` interest profiles.

Planning and implementing Entrepreneurship Education

The main goal of many didactical interventions of entrepreneurship education is to foster autonomous learners (e.g. Oosterbeek et al., 2010). With regard to entrepreneurship education, Tramm and Gramlinger (2006) differentiate between four dimensions of autonomy:

1. Entrepreneurial autonomy. The autonomous entrepreneur founds and leads businesses and works for his/her own profit and risk.
2. Vocational autonomy. The intrapreneur works independently within a company and makes

ISSN 2164-2877 (print)
ISSN 2164-2885 (online)

autonomous decisions based on the company's strategies and aims.

3. Self-marketing. The dimension of self-marketing adheres at the worker's ability to obtain, develop and market one's own competences within the person's vocational environment.
4. Personal autonomy. A person with personal autonomy is able of organizing his/her own life actively, adequately and in a responsible way.

Based on these four types of autonomy, entrepreneurship education is not limited to enabling learners to found and lead his/her own business (also see Drucker, 2002, p. 21), but also to work independently within an existing enterprise (as intrapreneur). All four types of autonomy build on each other: An entrepreneur must exhibit (1) entrepreneurial autonomy through founding and leading businesses, (2) vocational autonomy within all tasks associated with leading the business, (3) self-marketing in promoting his/her own vocational competences and (4) personal autonomy in being a mature and responsible citizen, capable of making autonomous decisions regarding one's own life choices. Therefore, facilitating (all four types of) autonomy can be considered a key component of entrepreneurship education.

Entrepreneurial qualities and their capability of enhancement

Entrepreneurs are generalists who have to be competent in all aspects of decision making (Casson, 2003; Drucker, 2002). Casson (2003) identifies ten main entrepreneurial qualities which the entrepreneur, as a leading organizer, should possess (see Table 1). Most decisions in the entrepreneurial context are of non-trivial nature. The challenge is that many of the skills and competences necessary to manage these decisions are scarce and distributed unequally. However, successful entrepreneurs should possess these skills or need to recruit specialists to fill their skills deficits. Therefore, delegation skills and organizational skills are also essential for entrepreneurs, even though they are not essential for the process of decision-making. With regard to entrepreneurship education, almost all of the major entrepreneurial qualities listed in Table 1 are capable of enhancement.

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Table 1
Major entrepreneurial qualities and their capability of enhancement

Quality	Essential to all non-trivial decisions	Scarce and unequally distributed	Capable of enhancement
Self-knowledge	✓		
Imagination	✓	✓	
Practical knowledge	✓		✓
Analytical ability	✓	✓	✓
Search skill	✓		✓
Foresight	✓	✓	✓
Computational skill	✓	✓	✓
Communication skill	✓		
Delegation skill		✓	✓
Organizational skill		✓	✓

Source: Casson (2003, p. 31).

Contents of appropriate entrepreneurship education can be found in numerous studies (e.g. Morris, Webb, Fu, & Singhal, 2013; Oosterbeek et al., 2010; Solomon, 2008). Based on the current literary discourse, four main aspects of entrepreneurship education can be derived (Rybnicek, Ruhri, & Suk, 2015): professional competences, behavioral and attitudinal competences, practical experience, awareness and self-assessment. However, this leaves two questions unresolved: (1) How can these aspects of adequate entrepreneurship education be enhanced methodically? (2) How can these methods be integrated into existing curricula?

Strategies for implementing entrepreneurship education

To implement entrepreneurship education in existing curricula, various approaches can be utilized, as exemplified by the case of Austrian Business Colleges (Lindner, 2009, p. 77): (1) Entrepreneurship education might be integrated as an educational principle within a whole curriculum (e.g. within the Austrian curriculum of Business Colleges). (2) Entrepreneurship education might also be integrated at the institutional level as school concept for one specific institution. As a result, various teachers and subjects at a given institution are committed to integrate methods of entrepreneurship education into their teaching practice. (3) Within a single institution, entrepreneurship education could be implemented as one focus of training amongst others (e.g. the focus 'Entrepreneurship and Management' within Austrian Business Colleges). Students opting for this specific focus will receive special training, while other students will not. (4) Finally, entrepreneurship education can be conducted as didactical interpretation of the regular curriculum. Following this paradigm, methods of facilitating entrepreneurship education are integrated into existing courses without creating new courses dedicated

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to entrepreneurship education. A comprehensive implementation of entrepreneurship education might follow different strategies simultaneously when creating an entrepreneurial learning environment.

Conducting Entrepreneurship Education

When it comes to conducting entrepreneurship education, measures are commonly limited to the higher levels of the corresponding education systems and often built on a narrow definition of entrepreneurship education by only focusing on the foundation of new enterprises (ET 2020 Thematic Working Group, 2014, p. 27). However, entrepreneurship education – in the broad sense of Tramm and Gramlinger (2006) – might be conducted for all age groups. Given the variety of possible measures of entrepreneurship education (EE), within this paper two possible settings for different groups of students at different levels of the education system are discussed: (a) a didactical setting for business students aiming at implementing entrepreneurship education into the multi-dimensional teaching and learning arrangement of business simulations and (b) a university program representing a special focus of training open for all students (business and non-business students). By following different strategies of implementation simultaneously, it is ensured that different students and their individual needs and interests are addressed by the proposed measures of entrepreneurship education.

Utilizing business simulations to conduct EE for business students.

With regard to the ten major entrepreneurial qualities (Casson, 2003, p. 31), business simulations are considered a method capable of enhancing a multitude of entrepreneurial skills (Riebenbauer & Köppel, 2009, p. 86). Business simulations, which are specifically designed for business students, can provide a valuable addition for fostering entrepreneurship education for various age groups. Business simulations can take various forms, e.g. as virtual enterprises or junior companies. These two types of business simulations are distinguished by the degree of realism of the two aspects ‘flow of goods and services’ and ‘external contacts’ (Tramm & Gramlinger, 2006).

Within a business simulation of the type of a virtual enterprise, the flow of goods and services is fictitious, while external contacts are real. Students work and learn within their own virtual enterprise and trade with other virtual enterprises run by other students at other institutions. While these external contacts are real, the flow of goods and services is fictitious as well as all transactions between the virtual enterprises (Stock & Riebenbauer, 2013). Currently, more than 7,500 virtual enterprises exist worldwide (EUROPEN-PEN International, 2016) enabling students to internationally market the product portfolios of their corresponding virtual enterprises.

Junior companies represent another form of business simulations. Within junior companies, both the flow of goods and services as well as the external contacts are real. Therefore, junior companies participate in the ‘real’ economy and require real money to fund their activities. Clear (economic) success criteria do not require as much teacher guidance as in virtual enterprises. However, a tradeoff between economic factors (e.g. being a profitable business) and pedagogic factors (e.g. individual learning aims of the students) has to be considered by the teacher.

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ISSN 2164-2885 (online)

Both types of business simulations might also be implemented consecutively (as illustrated by Tramm & Gramlinger, 2006, p. 19). Students start with a junior company forming a practice oriented and highly motivating introduction to entrepreneurial thinking and acting. This can be followed by a virtual enterprise to engage into worldwide business activities and to illustrate complex economic relationships. However, neither form of business simulation automatically fosters entrepreneurship education. Instead, proper modelling is required: Teachers must be open towards implementing aspects of entrepreneurship education into their teaching practice. Modelling should allow for action-oriented learning, an interconnection between theory and practice and the formation of a proper entrepreneurship climate. In addition, a creative pre-phase, where students have the possibility to develop their virtual enterprises' strategy and product portfolio, can provide another entrepreneurship aspect to the model of the virtual enterprise. With proper modelling (e.g. target orientation, project management, cooperation with real-life businesses), business simulations can provide a valuable addition to facilitating entrepreneurship education within the classroom by fostering the development of all four types of autonomy (Riebenbauer, Dreisiebner, & Stock, 2016). The role of a teacher in a business simulation is of multi-dimensional nature, with the teacher acting rather as learning companion, moderator and coach than as mere conveyor of knowledge (Stock & Riebenbauer, 2013). Thus, teaching entrepreneurship with business simulations represents a challenging task for business teachers.

Utilizing special focuses of training to provide EE for all students.

A limitation of the previously discussed teaching and learning arrangements is that they are specifically designed for business students and require certain skills to participate.1 However, by definition, entrepreneurship education is not strictly limited to business majors. To reach a wider audience of students (e.g. students of medicine, pharmacy, sports, law, engineering), in 2014 the University of Graz introduced the 'Transfer Initiative for Management- and Entrepreneurship-Basics ('Basics' = in German: Grundlagen), Awareness, Training and Employability' (TIMEGATE). The program was designed as a response to the relatively low number of university students who were aiming at a career in entrepreneurship. Instead, students tended to strive toward traditional careers, mainly due to the fear of failure in the founding process (Rybnicek, Ruhri, & Suk, 2015, p. 24). According to the approaches towards entrepreneurship education (Lindner, 2009, p. 77), these measures qualify as focus of training, combining different classes for the purpose of entrepreneurship education.

Currently, students may choose from a range of 56 different courses, arranged in three modules (Basics of Business Administration and Founding, Personality and Perspective, Practice-Transfer). All persons fulfilling the general university entry qualifications may apply for TIMEGATE courses. There are no prerequisites or previous knowledge regarding the subject required. Within the program, students receive the possibility to gain insight into the process of finding a business idea, creating a business plan

[1] Nevertheless, business simulations are not strictly limited to business students, and may also be applied in other subjects to develop students' competences.

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and the process of founding a start-up company. Further special learning and teaching activities comprise startup mingle, foundation garage, idea contests or collaborations with science parks and real entrepreneurs (Rybnicek, Ruhri, & Gutschelhofer, 2015; TIMEGATE, 2017).

Challenges for Teaching Entrepreneurship Education

The previously presented settings to foster entrepreneurship education – as any other didactic setting – require students to learn in order to obtain new competences regarding a certain subject under the assistance of a teacher (didactic triangle: Meyer, 2012, pp. 457–460). A synthesis of more than 800 meta studies (Hattie, 2010) confirms the important role of the teacher in the classroom. Regarding entrepreneurship education, this raises the question whether teachers might be able to act as proper role models to cast the entrepreneurial spirit upon the students.

An investigation into a person's entrepreneurial mindset might take place with the individuals' interest profiles. One model designed to investigate a person's interest profile is the RIASEC model (Holland, 1973). The core of this model consists of six interest dimensions, which can be displayed as a hexagon (see Figure 1). An individual might have interests in the following dimensions: Realistic (doers), Investigative (thinkers), Artistic (creators), Social (helpers), Enterprising (persuaders) and Conventional (organizers).2 Dimensions situated next to each other in the hexagon have been proven to show a high correlation (e.g. persons with a high social score are often also highly artistic), whereas opposite positions in the hexagon represent a lower correlation (e.g. conventional people often score low in the artistic dimension).

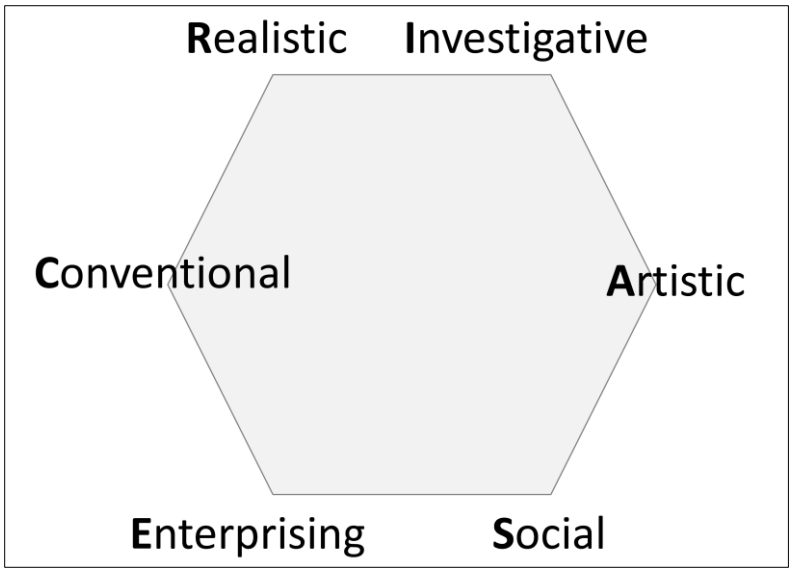

Figure 1. RIASEC model. Adapted from Holland (1973).

[2] Paraphrase of the six dimensions according to University of Missouri Career Center (n.d.).

ISSN 2164-2877 (print)
ISSN 2164-2885 (online)

The individual interest profile can be obtained via standardized tests, with the majority of them originally designed for the purpose of career counselling (e.g. Bergmann & Eder, 2005; Holland, 1973; Jörin, Stoll, Bergmann, & Eder, 2003). In career counseling, the Holland model is applied to match individuals and jobs according to their interest profiles. Each person's individual interest profile is expressed by a three-letter-code, consisting of the three most distinctive interest dimensions (Holland, 1973, pp. 86–91).

For the vocation of the 'Entrepreneur' the corresponding Holland code is ESA – Enterprising, Social and Artistic (University of Missouri Career Center, n.d., p. 5). According to this code, entrepreneurs are interested in working with other people, persuading them to invest in their idea and in managing the goals of their organization (Enterprising dimension). They are also characterized as helpers who like to support people (Social dimension) and they are "creators" (University of Missouri Career Center, n.d., p. 4) who like to use their creative potential to initiate innovations (Artistic dimension).

Yet, this leaves the question unanswered whether teachers match the interest profile of a typical entrepreneur. A study regarding the vocational interests of future Austrian teachers reveals three distinctive interest-profiles (Bergmann, 2007). For this purpose, 215 university students of three different study programs (Business Education, Teacher Training STEM and Teacher Training Art) were questioned utilizing the EXPLORIX questionnaire (www.explorix.de, Jörin et al., 2003), a German adaption of Holland`s Self-Directed Search (Holland, 1973, pp. 119–131). Figure 2 shows the interest profiles for each of the three groups of teachers regarding the RIASEC dimensions, with a higher score implying a greater interest for the corresponding dimension.

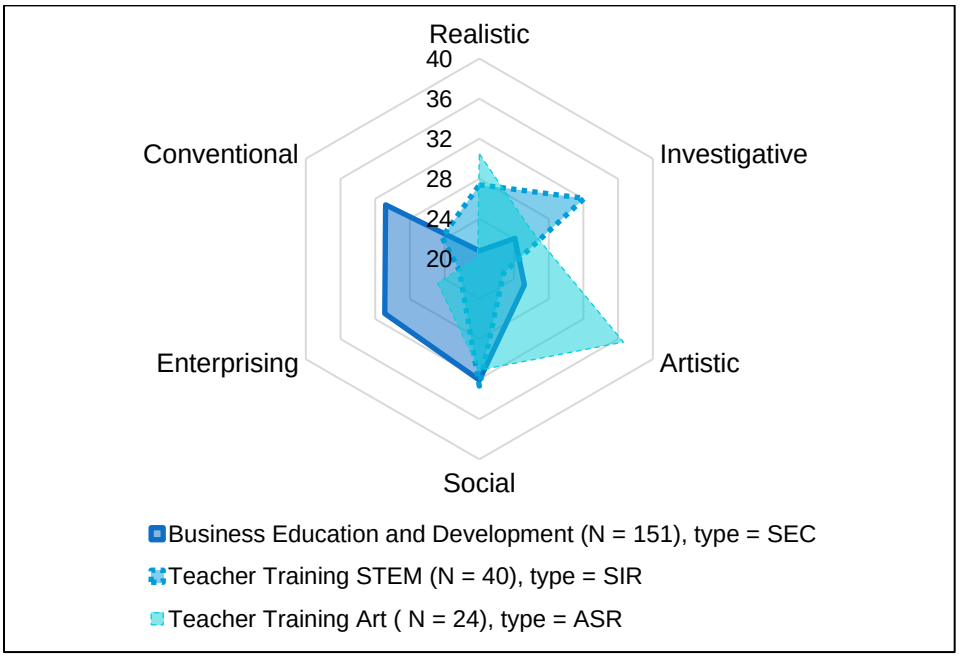

Figure 2. EXPLORIX profiles of students from different study programs. Adapted from Bergmann (2007), Data according to Bergmann (n.d.).

ISSN 2164-2877 (print)
ISSN 2164-2885 (online)

Results yield the three-letter-code SEC (social, enterprising, conventional) for the students of Business Education, SIR (social, investigative, realistic) for the students of Teacher Training STEM and ASR (artistic, social, realistic) for the students of Teacher Training Art. Compared to the students of the other two programs, students of Business Education score higher in the enterprising dimension, but much lower in the artistic dimension compared to the students of Teacher Training Art. Data from the same three study programs utilizing the General Interest Structure Test (AIST, 'Allgemeiner Interessens Struktur Test') (Bergmann & Eder, 2005) confirm these results, leading to the same subtypes for the two Teacher Training programs (SIR for STEM; ASR for Art) and the (similar) three-letter-code CSE for the students of Business Education (Bergmann, n.d.).

The results for future Austrian teachers by Bergmann (2007) are in accordance with earlier findings by Campbell and Holland (1972), who found that teachers of business education are – together with bankers – the profession with the highest score on the conventional interest dimension among all examined professions. Not even accountants score as high on the conventional scale as teachers of business education. On the realistic dimension, however, teachers of business education scored particularly low. These findings regarding the interest profiles of business teachers of Campell and Holland (1972) were later confirmed by Chacko (1991).

Based on these findings it can be concluded that students of Business Education are generally interested in three dimensions viable for a 'good' business teacher – they are helpers, persuaders and organizers. But they lack the artistic (innovative, creative) interest dimension required by the entrepreneur. Instead, they are 'conventional', interested in tasks that require accurate work structured by a predetermined set of rules (e.g. bookkeeping). Figure 3 compares the Holland codes for students of Business Education (code SEC) with the code for the vocation of the 'Entrepreneur' (code ESA).

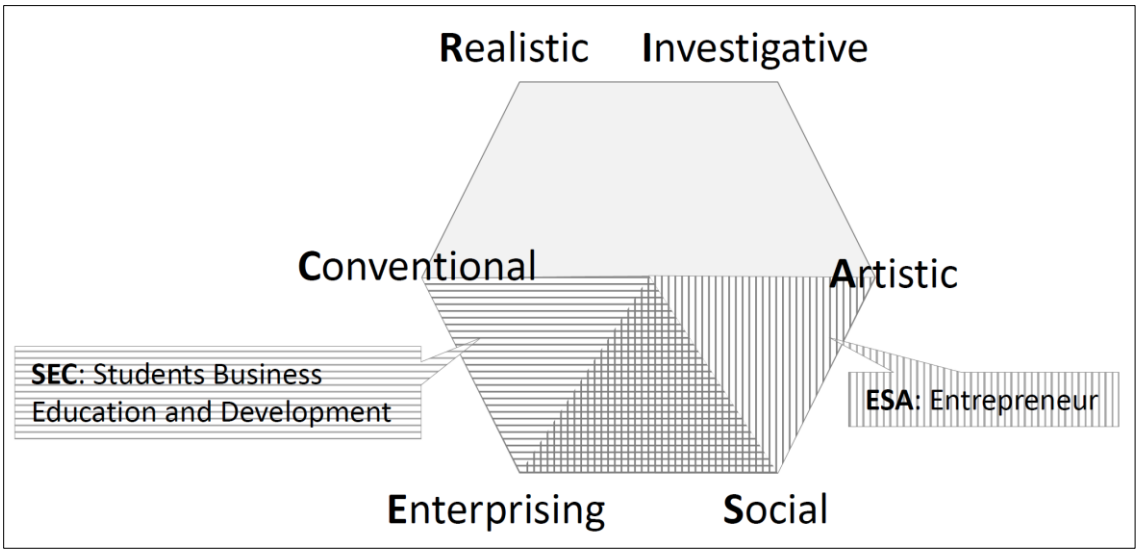

Figure 3. Holland codes for Students of Business Education (SEC) and Entrepreneurs (ESA).

ISSN 2164-2877 (print)
ISSN 2164-2885 (online)

Students of Business Education and entrepreneurs alike share the enterprising and social interest dimension. However, while students of Business Education are conventional 'bookkeepers', entrepreneurs are artistic 'creators'. Within Holland's hexagon, the two dimensions artistic and conventional show the lowest correlation among all dimensions (Holland, 1973, p. 23), thus implying that it is unlikely that the 'conventional' business educators also show the 'artistic' character traits of the entrepreneurs. For teachers of business education this leads to the challenge of awakening the students' interest in becoming an entrepreneur without being an entrepreneur themselves, but rather an intrapreneur (who is defined as a person being capable of working independently within an institution and to make autonomous decisions based on the organization's strategies and aims).

Conclusion and critical appraisal

Various strategies can be followed to foster students' competence development according to a broad understanding of entrepreneurship education. Within this article, two teaching and learning settings for fostering entrepreneurship education have been described: (1) Business simulations specifically designed to improve the competences of business students and (2) a university-wide facultative focus of teaching entrepreneurship addressing all students.

Despite the differences in the didactical settings, one aspect remains constant: all aspects of the teaching and learning method must be designed with respect to entrepreneurship education. This Constructive Alignment (Biggs, 2016) covers three dimensions: 'aims of teaching and learning', 'applied methods' and 'assessment'. With the aim of fostering entrepreneurship education, it seems quite logical that the applied teaching method should be chosen in line with this specific aim. As argued by Riebenbauer, Dreisiebner and Stock (2016), business simulations might be one method to be chosen when the underlying aim is to teach entrepreneurship education. However, beside aims and methods there is also a third aspect to be considered that is, assessment. Assessment has to be adjusted to the aims and methods since learners tend to align their learning processes not towards the teacher's learning aims but towards the expected assessment. As a consequence, measures of entrepreneurship education aiming at the development of entrepreneurial qualities should also incorporate assessment specifically tailored towards the intended students' learning aims (for the assessment of multidimensional learning environments such as business simulations see Stock, Riebenbauer, & Winkelbauer, 2010).

According to Hattie (2010), teachers are the most important factor in the classroom when it comes to fostering student learning. However, as illustrated by the investigation of Bergmann (2007), the 'typical' business teacher displays an interest spectrum different from an entrepreneur. Based on this observation, one can conclude that a business teacher as an intrapreneur may certainly be the 'right' person when it comes to support students in obtaining the competencies necessary to run a successful start-up (e.g. business administration, accounting). However, this person is most likely not a suitable role model for the students when it comes to inspire people to actually become entrepreneurs through founding a start-up.

ISSN 2164-2877 (print)
ISSN 2164-2885 (online)

As a practical implication, role models might be involved in entrepreneurship education for example in the form of lectures by founders or in the course of mentoring programs. Such mentoring programs have also been proven to be the most desired support measure for young founders (Ideentriebwerk Graz, 2017). In addition, mentoring programs allow for individualization by meeting the needs of special groups of students. For example within TIMEGATE, the program 'Female Academics meet Executives' (FAME) offers female students a possibility to enhance their career network (TIMEGATE, 2017). Similar measures might be also applied in business simulations, where successful start-ups can act as partner company for a virtual enterprise. Such partner companies can be used as prototype for the modelling of the virtual enterprise and their founders might serve as role models for the students.

However, business simulations or special focuses of training such as the TIMEGATE program represent just two out of many possible options to conduct entrepreneurship education in the classroom. As indicated by Riebenbauer and Köppel (2009, p. 86) there exists a multitude of possible methods, ranging from complex teaching and learning settings (e.g. business simulations, case studies, business games, project-based learning) to components which might be applied in a variety of in-classroom situations. Such components include providing feedback (to increase self-awareness of the own entrepreneurial skill-set) and providing opportunities for reflection (e.g. upon experiences gained during internships). Providing assistance to implement such didactical settings in classroom work is of great practical importance for teachers of business education.

Despite the teacher's importance in designing didactical settings and implementing the content of the curricula, the students still have an important role to play in entrepreneurship education. The competencies necessary to build up a successful enterprise cannot be taught by a teacher – instead, they have to be obtained by the students themselves through learning, with the teacher acting in the function of a learning companion, moderator or coach. Providing thoroughly designed curricula and didactical settings can act as a valuable contribution to assist teachers in their teaching and students in their learning process and to boost entrepreneurship education in the classroom. However, there is a need for further research to evaluate the impact and potentially improve the quality of already existing curricula and didactical settings with the aim of fostering entrepreneurship education.

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ISSN 2164-2877 (print)
ISSN 2164-2885 (online)

What must a lecturer/instructor (teacher) be able to do to inspire entrepreneurship and business students?

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ABSTRACT

This paper discusses what a lecturer/instructor (teacher) must be able to do to inspire entrepreneurship and business students. Entrepreneurship, particularly start-up business, has become a top priority in national government policies due to its ability to drive creativity, innovation, competitiveness, employment and growth. The goal is not to make the students rush to become entrepreneurs or business-oriented professionals but rather provide them with tools that enable realistic self-evaluations and learn to recognize different opportunities around them.

The study seeks to define the skill sets that the inspiring entrepreneurship and business teachers consider essential to their work. Teachers expressed their views in small focus groups of their peers, i.e. other teachers. The theoretical framework consists of theories dealing with the general skill sets and expertise of the teachers. The empirical data were collected through a Finnish adaptation of the Canadian DACUM (Developing A CUrriculuM) model which is used to analyze the contents of the requirements of various occupations. A separate questionnaire has been used to support the data collection.

This study indicates that most of the entrepreneurship teachers are females whose pedagogical experience seems to be more comprehensive and long lasting than their male colleagues possess. However, they are often short of practical skills. On the contrary, the male colleagues have more experience in practice but with quite narrow pedagogical skills. The female entrepreneurship teachers tend to be inspired, but they often have too little experience in practical working life. According to today's trend, entrepreneurship teachers are anticipated to be not only traditional teachers but also entrepreneurs with their own company.

Keywords: Inspiring, Expertise, Entrepreneurship, DACUM model, Skill set, Teacher, Business students

Introduction

Entrepreneurship, as well as start-up business, has met much success in national government policies due to its ability to drive creativity, innovation, competitiveness, employment and growth. These are key

ISSN 2164-2877 (print)
ISSN 2164-2885 (online)

components of any sovereign country's welfare. Even though this is agreed on by most people, rather small steps are taken to develop those inevitable activities in many countries. (Suonpää, 2013)
The process of becoming an entrepreneur is a long one, and to support this process, educational institutions should provide the students with tools that enable their growth to entrepreneurship. The students should be trained by an entrepreneurship teacher or a business-oriented professional to learn to recognize the different opportunities that arise around them. Students have various needs at different stages of their studies. In entrepreneurship studies supported by the counselling process, there are three key principles that should be taken into account. The counselling process should be:

(a) holistic, i.e. considering a student's whole life situation;
(b) individual and student-oriented; and
(c) flexible and versatile (Römer-Paakkanen & Takanen-Körperich, 2011).

The students, teachers, and career counselors in educational institutions need tools for ideal learning results to anticipate and assess the future direction of the students' working life and their role in society. Today, and even more in the future, coping with work duties requires a self-directed approach to work:

> People need to commit to an entrepreneurial attitude as they must repeatedly renew their competencies and skills. Such characteristics as willpower, intuitive thinking, spirit and communication skills impact on ability to manage practical problem-solving situations. The ability to learn from experience and lifelong learning are valued (Munch & Jakobsen, 2005).

As the role of an inspiring entrepreneurship and business teacher must be flexible and versatile, he/she must accept and take advantage of the changing learning environments.

Purpose of the study

The aim of this study is to describe and analyze the competencies, skills and attitudes that make up the expertise of the inspiring entrepreneurship teachers as expressed by them.

Analysis in this context refers to classification and not to cause-and-effect analysis. It is described what the entrepreneurship teacher and business-oriented professional must be able to do to inspire entrepreneurship and business students. The goal in entrepreneurship and business education is not to make the students rush to become entrepreneurs or business-oriented professionals but rather to provide the students with tools that enable realistic self-evaluations. The students should also be trained to learn to recognize different opportunities around them.

Research questions

The research problem is examined through the following study questions:

1. What are the core skills or skill sets that entrepreneurship and business teachers say make up their work?

ISSN 2164-2877 (print)
ISSN 2164-2885 (online)

2. What kinds of expertise make up the core skill and skill sets?
3. Which sub-skills make up the above core skills?
4. How can skill sets be classified into cognitive, psychomotor and affective elements?

The theoretical framework consists of theories dealing with the key concept of competence and the general skill sets and expertise of teachers. For purposes of this study, skill set embodies the competence and attitudes of the inspiring entrepreneurship and business teacher as illustrated in Figure 1.

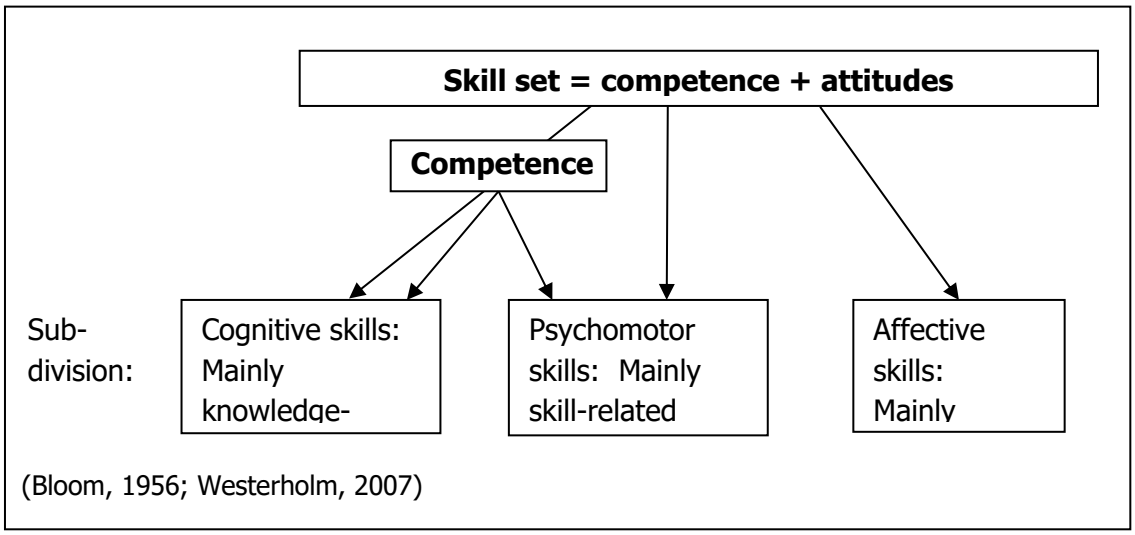

Figure 1. Conceptual Model of a Skill Set

The categories in the sub-division are not mutually exclusive, and they may overlap. A belief, for example, may be cognitive-affective by character while a skill may have a strong cognitive orientation.

The theoretical framework consists of theories dealing with the general skill sets and expertise of the teachers. The empirical data were collected through a Finnish adaptation of the Canadian DACUM (Developing A CUrriculuM) model which is used to analyze the contents of the requirements of various occupations. A separate questionnaire has been used to support the data collection.

Review of the literature

Skill sets considering earlier research.

The concept of competence embodies expertise, skill, qualification, ability, capacity, efficiency, proficiency, and skillfulness. It is an amalgam of knowledge, behavior, attitudes, and values referring to the mastering of a skill. Learning, or achieving a goal, is construed as a skill. Competence is also linked to

ISSN 2164-2877 (print)
ISSN 2164-2885 (online)

creativity, innovativeness, flexibility, endurance, precision, and accuracy (Westerholm, 2007). According to Ruohotie and Honka (2003), there is a large number of scientific literature available that deals with competencies and qualifications. Regardless, the use of these concepts has been inconsistent and no consensus has been reached on their semantic content (Nijhof & Streumer, 2001; Rychen & Salganik, 2003).

Earlier research on lecturer/instructor skills.

Teachers play a key role in promoting entrepreneurship education and learning (Hannula, Ruskovaara, Seikkula-Leino & Tiikkala, 2012). Suonpää (2013) states that "the role of the teacher is not to deliver the right knowledge to the students, but to support the students to construct their own knowledge in social process facilitated by the teacher. The teacher supports the students' individual and collective learning goal setting based on the needs of the students rather than setting the learning goals for them" (p. 126). Knowledge is not seen as an objective substance owned and transferred by a teacher to students, but it is created in students' active social processes in action. So, knowledge is contextual and subjective (Kyrö, 2005; Kirby, 2007).

Römer-Paakkanen and Takanen-Körperich (2011) established in their research that a distinct line should be drawn between how the teacher should meet the student, to be interested in students' everyday life and how to teach entrepreneurial attitude. The teacher must comprehend the concept and totality of the business along with the distinctive characteristics of each sector, i.e. they must possess a cognitive knowledge of business activities. Affective and psychomotor competences are now highlighted in the expertise alongside the traditionally emphasized cognitive competence. The main target is to help the students to find out their own strengths and competencies in the future society and in future labour markets.

To adopt entrepreneurship as part of culture in vocational education means according to Koiranen (2007) that each entrepreneurship teacher working in payroll system must find intrapreneurial feature in his/her teaching work. He/she owns an entrepreneurial responsibility for modern, high-class and desired teaching. In this way entrepreneurship for its part can have influence on the institution's productivity.

Entrepreneurship education is an enormously complex web with many parties involved. Teachers are an important element because they are responsible for the actual teaching. Also, they are in contact with the students and the environment, and the teachers accumulate a lot of knowledge during the education. "Teachers' own understanding regarding the objectives, methods and results, which make way for reflection, play an immense role in successful entrepreneurship education" (Seikkula-Leino, Ruskovaara, Ikävalko, Kolhinen and Rytkölä, 2013, p. 165). Moberg (2013) states that entrepreneurship education is a heterogeneous field with several perspectives. There is no real consensus stating which types of skills are more important than others when it comes to new venture creation, and it is often

ISSN 2164-2877 (print)
ISSN 2164-2885 (online)

contested what "real" entrepreneurial activity means. To capture these different views, an entrepreneurial self-efficacy scale needs to incorporate a large range of different skill-sets (Moberg, 2013). Entrepreneurship education is often wrongly comprehended as a homogeneous topic that can be taught to every student in the same way, without taking into the consideration their disciplinary background (Honig, 2004).

Interest in entrepreneurship education has been growing enormously over the last two decades (Kuratko, 2005). Today the trend has been that teachers meet new pedagogical challenges in their everyday work. According to Römer-Paakkanen and Pekkala (2008), growing to entrepreneurship could be understood as a triangulation process of socialization, education, and experiences. The process develops in different environments or systems in family (family system), in school (education system), and in free-time activities and hobbies (informal and non-formal systems). Counselling, coaching, and mentoring form a supporting system, and they are the catalysts in this process. Counselling focuses on an individual, and it produces self-directive actions. Its aim is to highlight competent learning and self-management. Entrepreneurial pedagogical culture supports this study and gives it importance in developing an entrepreneurial culture by fostering an entrepreneurial attitude, entrepreneurship skills and awareness of career opportunities (Commission of the European Communities, 2006; Römer-Paakkanen and Pekkala, 2008).

Methodology

This study follows a mixed-method design, and the research approach is qualitative and phenomenographic. It is based on the DACUM model outcomes and on a supplementary questionnaire.

One central perspective for the selection of research methodology is the discipline under which the research is presented and which it references. Every scientific discipline seeks to define its own characteristic methods and uses them to justify its specificity. Differences between disciplines are considerable in this respect (Kyrö, 2004).

The study of qualitative learning starts from the premise of intentionality. Instead of merely reacting to external stimuli, humans are autonomous subjects who seek to construct a view of the world for themselves. Phenomenography is the study of how the world appears to people, how people perceive, understand, interpret and experience things and events, how they form ideas about them, and what types of structures people construct in their minds about reality (Järvinen & Järvinen, 2004; Marton, 1994; Metsämuuronen, 2003).

The DACUM model provides training in multi-level thinking. The job analysis consists of breaking down the work into knowledge, skills and attitudes that directly correspond to Bloom's Taxonomy. It is not a means of psychological testing but rather a quick and quite reliable method of analyzing different occupations and professions.

ISSN 2164-2877 (print)
ISSN 2164-2885 (online)

Execution of the empirical study and research setting

The data collection method in this study was the DACUM model which provided a tool for the precise determination and recording of the knowledge, skills and attitudes required in various occupations. Teachers were given an opportunity to express their views in a small focus group of peer teachers. Consensus opinions formulated by the groups were then meticulously documented, i.e. the DACUM model delivers a single-page occupation-analysis chart consisting of knowledge, skills and attitudes based on the session. The practical work of gathering the data in the DACUM sessions were performed by a facilitator and a recorder (Westerholm, 2007).

The DACUM model (Coffin, 2002; Glendenning, 1998) is built around general areas of competence (GAC), each of which involves different skills. General area of competence equals the key competences in the European Commission's recommendation on key competences (EU 2004 & 2006) and the core expertise in the framework concerning European expertise, making the general areas of competence in the DACUM analysis comparable to both. Besides specific knowledge, the general areas of competence may also comprise tacit knowledge that manifests in the context of the work (Alvarez & Busenitz, 2001; Barney, 1991; Polanyi, 1962). In Bloom's Taxonomy factual skills correspond to cognitive and psychomotor skills while personal skills mainly correspond to affective skills (Allahwerdi, Hietaharju, Kolstela & Laikio, 2006). In this study cognitive skills mainly correspond to knowledge-based competence while affective skills correspond to attitude and tacit knowledge can be in e.g. psychomotor skills.

The two researchers of this study act as a facilitator and as a recorder. The researchers and the organizer nominate participants and possible observers whose role in the DACUM session is to prompt discussion, not formulate opinions. The core skills from the work analysis charts of the two DACUM workshop groups abroad are presented in Appendices A and B and supplementary questionnaires in Appendices C and D as well as a Finnish sample in Appendix E. They were classified as cognitive, affective, or psychomotor as well as cognitive-affective, cognitive-psychomotor, affective-psychomotor, or cognitive-affective-psychomotor skills according to Bloom's Taxonomy. The classification here was performed by the researcher, who served as a facilitator to the groups. The classification was reviewed by the researcher and the experienced entrepreneurship teacher and pedagogue who attended each DACUM workshop and served as a recorder. The classification was based on subjective interpretation of both the work analysis charts of the two workshops and observations made during the workshop sessions. The supplementary questionnaires were talked over in the same way. Different opinions were discussed until consensus was reached. After classification, the various sub-skills were added together and the numbers of each sub-skill listed to facilitate comparisons. The result of the classification of competences and attitudes in the manner described above represents thus one interpretation based on five analyses, and as Ruohotie (2006) has noted, there are no clear-cut criteria for defining key competencies.

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The empirical data are based on 26 samples of entrepreneurship and business teachers. These informants (21 female and 5 male teachers) are introduced in Appendix F. The consensus opinions formulated by the group were then meticulously documented. Besides the teachers' demographic data, their core competencies and supporting skills together with the attitudes were illuminated by a separate questionnaire which supported the DACUM data collection (Appendices C, D, and E).

In addition to Finland, the data were also accumulated at international conferences. This means in the DACUM workshops, where the participants came from Austria, Belgium, Finland, Great Britain, Greece, and Portugal and at the 89th International SIEC-ISBE conference in San Juan, Puerto Rico, July 2017, where the participants were from Finland, Iceland, Poland, Puerto Rico, Sweden, the Bahamas, and the United States. The research data were obtained from 12 Finnish and 14 foreign entrepreneurship and business teachers. Use of the DACUM model was limited to development undertaken in Canada and its partial Finnish application.

The essential aspect of describing expertise is the use of active verbs which reflect the levels of thought and cognitive function. For example, the following aspects were raised to be taken into consideration during the DACUM workshop at the International SPACE Network 28th AGM and Conference in Portugal, April 2017:

"As an inspiring teacher, I must be able to…

- learn (core skill) → reflect in and reflect on, have subject knowledge, learn by doing (sub skills)
- create safe environment (core skill) → establish shared values, understand needs and wants, respect (sub skills)
- trigger = inspire passion (core skill) → provide thinking space, notice (sub skills)
- facilitate (core skill) → listen, understand process, manage, question, adapt,
- compromise (sub skills)
- stimulate (core skill)
- collaborate (core skill)
- "storytell" (core skill) → accept failure to use it positively (sub skills)."

In the workshop during the 89th International SIEC-ISBE conference in Puerto Rico, July 2017, the following aspects were raised into consideration:

"As an inspiring teacher, I must be able to…

- engage (core skill) → be enthusiastic, open-minded, good communicator (sub skills)
- make relevant (core skill)
- be dynamic (core skill)
- trust myself (core skill)

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- solve problems (core skill)
- integrate (core skill)
- accept mistakes (core skill)
- respect (core skill)
- mentor (core skill)
- have practical experiences (core skill)
- have team building (core skill)
- believe in students (core skill)."

Although the teachers were from different countries, different cultures, different ages (43–70), male and female, the challenges between them and their students were very similar (See Appendix F).

The research setting of this study is illustrated in Figure 2:

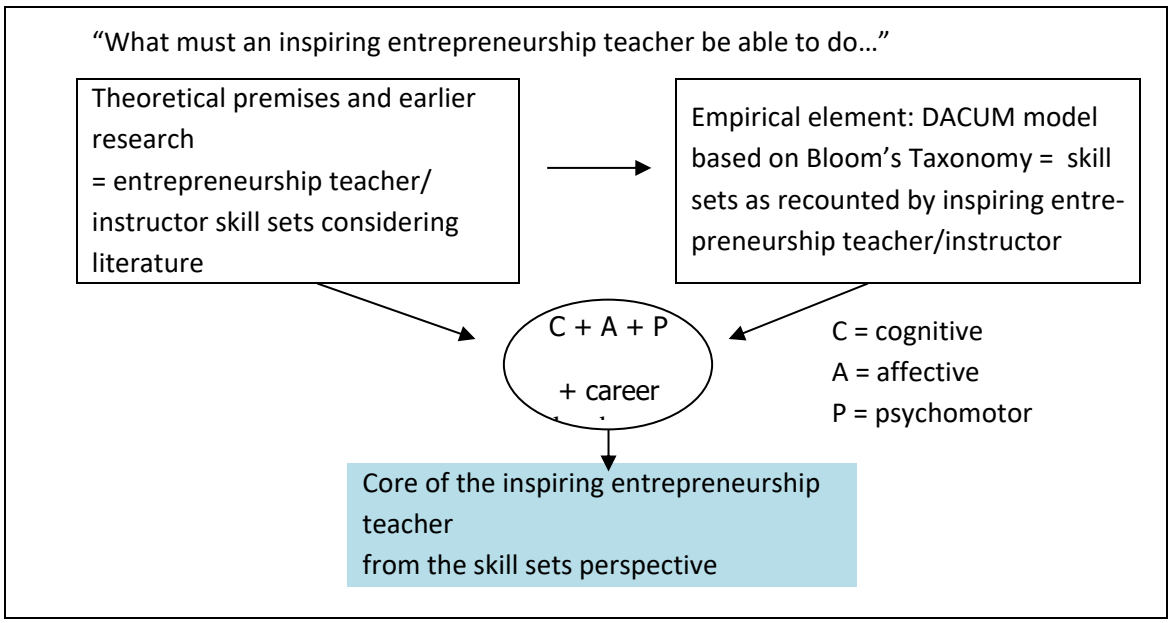

Figure 2: Research setting

The knowledge, skills, and attitudes appearing on the job analysis charts and in answers to questionnaires are organized into a portrait of the inspiring entrepreneurship and business teacher based on the Bloomian vision underlying the DACUM model (Bloom, 1956; Bloom & Krathwohl,1956; Krathwohl, Bloom & Masia, 1964; Dave, 1967 & 1970) and expressed as cognitive (C), psychomotor (P) and affective (A) skills. This study based on the DACUM Analysis including the findings of the questionnaires gives rise to the outcome describing the core of pedagogical and educational skills, which in turn provide an answer to the question of what entrepreneurship and business teachers personally feel they must be able to do.

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Discussion of the research findings

The study sought to describe what entrepreneurship and business teachers themselves feel they must be able to do to inspire entrepreneurship and business students. The study produced knowledge about their skill sets and partly about entrepreneurship education. The outcome shows that a distinct line should be drawn between how the entrepreneurship and business teacher meets the student to show interest in student's everyday life and how to teach entrepreneurial attitude and behavior in future working life.

The teacher must comprehend the concept and totality of the business along with the distinctive characteristics of each sector, i.e. he or she must possess a cognitive knowledge of business activities. Affective and psychomotor competence and attitudes are now highlighted in the teacher's expertise alongside the traditionally emphasized cognitive competence and attitudes.

Findings relative to earlier doctrine

Schools tend to increase their commitment of resources to entrepreneurship education. They seek a greater number of tenured and tenure track faculty with expertise in entrepreneurship. The field of entrepreneurship is in its growth mode, and there are no signs of it slowing down (Finkle, 2010, pp. 40-42).

As to this study, the entrepreneurship and business teachers should establish their shared values in main core skills by

- creating safe learning environment in mutual respect;
- creating inspiring atmosphere by contextual storytelling focused on success stories;
- teaching students to accept their failures and taking advantage of them in a positive way;
- promoting critical thinking; and
- using relevant technology.

Suonpää (2010) summarizes in her research that entrepreneurship education has three goals which are learning about, learning through and learning for entrepreneurship. Most students learn about entrepreneurship which often means designing their own business plan. If the studies are based on literature, students lack opportunities to learn through entrepreneurship. This involves the design of a pedagogical process to facilitate an entrepreneurial way of learning and behavior (Suonpää, 2010). According to questionnaire data (Appendices C, D, and E), Finnish entrepreneurship teachers showed mostly "learning through entrepreneurship" by CAP core skills, whereas the foreign entrepreneurship

ISSN 2164-2877 (print)
ISSN 2164-2885 (online)

teachers showed mostly “learning for entrepreneurship” at the conferences in Porto and Puerto Rico. After our classification these groups showed mostly A core skills.

This study indicates that now most of the entrepreneurship teachers are females whose pedagogical experience seems to be more comprehensive and long-lasting than their male colleagues possess. However, they are often short of practical skills. On the contrary, the male colleagues have more experience in practice, but with quite narrow pedagogical skills. The female entrepreneurship teachers tend to be inspired, but they often have too little experience in practical working life. According to today´s trend, entrepreneurship teachers are anticipated to be not only traditional teachers, but also entrepreneurs with their own company.

Entrepreneurship teaching consists of three factors which are social, psychosocial and pedagogical, and reaching them demands collaboration between educational institutions and employer sector. Thus, today practical skills are necessary. However, in our research the attitude is the most demanded quality in sub-skills.

The most natural environment for teaching has been the classroom where the teacher and the students meet their peers regularly under the guidance of the teacher, but today the trend is working life focused. However, the guiding role of the teacher is irreplaceable. The working life environment does not necessarily have pedagogical tools available for the teacher in the same way as the teacher has them in the classroom environment.

Results

The core skill set of the inspiring entrepreneurship teacher considering this study perceives both cognitive and affective core skills as extremely important core expertise, which is perceived as equally important in work situations, yet cognitive-affective-psychomotor skills are just as important. This even distribution of skills in each of the categories in Bloom’s Taxonomy would indicate the existence of the modern inspired entrepreneurship teacher. A slight difference was observed on the one hand between younger and less experienced teachers and on the other hand older and more experienced teachers. Barely any pure psychomotor skills can be found at the core of expertise. It is our observation that the inspired entrepreneurship teacher is not aware of the psychomotor nature of the transfer of cognitive knowledge. Cognitive knowledge thus transfers through action when necessary, yet the teacher does not perceive knowledge as action or takes it more or less for granted.

The teacher is an expert whose skills, knowledge, and attitude support the students to learn. Applying knowledge, putting theory into practice and using knowledge are required in inspiring teacher’s everyday work. His or her main tasks are to:

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- help students in learning;
- act as a facilitator;
- motivate the students to communicate;
- improve the student to understand different behaviors;
- give tools for professional growth;
- deliver immediate feedback and ideas;
- promote critical thinking; and
- use relevant technology.

These facts have an outstanding possibility to come true in a classroom where the students support each other giving and getting feedback and peer evaluation. They share learning and work to reach the same goal and at the same time they take responsibility of the learning of their peers. The teacher is obliged to create a positive atmosphere and stay in active interaction with each student. At the same time a close collaboration with working life creates an active learning environment.

In summary, the empirical results illuminate that the inspiring entrepreneurship teacher is influenced partly by the knowledge and skills resulting from pedagogical and theoretical competence and attitudes, partly by the increasing work cooperation between educational institutions and an employer sector.

Conclusions and some practical implications

The researchers found that teacher education is in focus, and this data indicates that the teaching is holistic, when all forms of the teaching should work together in a concerted effort. The students should know whom to contact, when and if they need support. Understanding of overwhelming teaching and learning process is constantly required. The teacher must be open-minded to experience, willing to hear and reconcile conflict situations. Also, it is of great importance that students' attitudes are trained, not only by the teacher, but also by peer students.

An essential prerequisite for entrepreneurship education and career path is that the teachers and career or entrepreneurship counselors are skilled and enthusiastic in the field. Both the previous studies and literature and our studies indicate that inspiring entrepreneurship teachers in their work should be versatile, flexible and accessible to all students.

According to the researchers' studies, an entrepreneurship teacher should understand both career and entrepreneurship as a holistic phenomenon. An entrepreneurship teacher should also work like an entrepreneur being creative, dynamic, risk-taking, and initiative oriented, hard-working, responsible and action motivated. He or she should possess a positive attitude towards entrepreneurship. That means appreciating market economy, business life, business, enterprises, entrepreneurs and work. Also, he or she should understand entrepreneurship as a phenomenon giving it a holistic meaning. This approach

ISSN 2164-2877 (print)
ISSN 2164-2885 (online)

means developing knowledge, skills and attitudes needed in business life and improving students to manage their own career lives. And finally, an inspiring entrepreneurship teacher must adopt modern learning paradigms. He or she should encourage students to the entrepreneurship and use methods appropriate for transferring entrepreneurial knowledge, skills and attitudes. Such appropriate methods activate students, favor student-orientation and emphasize social interaction.

The experiences of the researchers and studies show that career and entrepreneurship education process in school environment or in higher education is not a linear process. Rather, it is more like a spiral process in which the different levels of career and entrepreneurship education are more inter-dependent and co-existing. The entrepreneurship student often finds spark to succeed in supporting of the inspiring teachers. These teachers should update their skill sets and ponder what they must know and be aware of so that they are able to inspire their students to become entrepreneurs. Thus, an outstanding change is focused on the greater influence of collaboration with working life.

The results of this qualitative and phenomenographic study can be implemented when planning and developing the training programs and curriculum from entrepreneurship and career point of view. Up-to-date and factually correct information along with positive attitudes towards entrepreneurship are prerequisites in helping young people to create their career and to become entrepreneurs. It is vital that students become familiar with the entire process, knowing how to set up an enterprise, design a business plan and making it grow and succeed. Above all they must know what it means on a personal level with correct attitude and what kind of opportunity this career choice can offer them and their families. Risks should also be charted and understood, but as the objective is to encourage people to adopt the field, entrepreneurship should be offered as a positive opportunity and challenge.

The entrepreneurship teachers in this research discovered many indispensable attitudes which they must be able to have to inspire the students in their studies and career options. These attitudes help the students to aim for personal growth and self-confidence in their future working life. As entrepreneurs-to-be, they want to become independent, and they want to regard themselves as experts in their career fields. Thus, future research should focus on students' abilities to invest more effort in effective entrepreneurial studies to establish startups.

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ISSN 2164-2877 (print)
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APPENDIX A

Summary of the core skills and sub-skills of the lecturers/instructors at the SPACE Conference DACUM workshop in Porto/Portugal, May 27, 2017

"As an inspiring teacher, I must be able …

Core Skills		Sub-skills					
To learn	CAP	Reflect in, reflect on CA	Have subject knowledge C	Learn by doing P			
To create safe environment	CA	Establish shared values CAP	Understand needs and wants CAP	Respect A			
To inspire passion = trigger	A	Provide thinking space CP	Notice CAP				
To facilitate	CAP	Listen CA	Understand process CP	Manage C	Question CA	Adapt CAP	Compromise CAP
To stimulate	A						
To collaborate	CAP						
To accept failure and use it positively	C	Storytell CAP					

	Core Skills	Sub-skills
C = Cognitive	**1**	**2**
CA = Cognitive-Affective	1	3
CP = Cognitive-Psychomotor	0	2
A = Affective	**2**	**1**
P = Psychomotor	**0**	**1**
AP = Affective-Psychomotor	0	0
CAP = Cognitive-Affective- Psychomotor	**3**	**6**
Total	**7**	15

ISSN 2164-2877 (print)
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APPENDIX B

Summary of the skills and sub-skills of the lecturers/instructors at the SIEC-ISBE Conference in Puerto Rico DACUM workshop, July 27, 2017

"As an inspiring teacher, I must be able (n=12)…

Core skills		**Sub-skills**		
To engage	CAP	Be enthusiastic A	Be open-minded A	Be a good communicator CA
To make relevant	C			
To be dynamic	A			
To trust myself	A			
To solve problems	C			
To integrate	CP			
To accept mistakes	CA			
To respect	CA			
To mentor	CAP			
To have practical experiences	CAP			
To have team building	CAP			
To believe in students	A			

	Core Skills	Sub-skills
C = Cognitive	**2**	
CA = Cognitive-Affective	2	1
CP = Cognitive-Psychomotor	2	
A = Affective	**3**	**2**
P = Psychomotor	**0**	
AP = Affective-Psychomotor	0	
CAP = Cognitive-Affective- Psychomotor	**4**	
Total	**12**	3

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Appendix C

SPACE Conference, Porto

Summary of a supplementary questionnaire

Core skills		**Supporting skills**		**Attitudes**	
Be a risk taker	CA			Organization skills	CAP
Be a good facilitator	CAP			Autonomy	A
Be creative	A			Motivation	A
Have own company	CP			Patience	A
Energy	P			Energy	P
Flexibility	A			Word awareness	C
Competence	CAP	Flexibility	A	Flexibility	A
Passion	A	Tolerance	A	Passion	A
Guidance	CP	Respect	CA	Problem-solving	C
Patience	A	Listen	CA	Optimism	A
Inspire/lead	AP			Courage	AP
				Empathy	A
Able to listen	A	Understand different levels of experience	CAP	Patience	A
Coaching	AP	Empathy	A	Understanding	A
				Entrepreneurial	CAP
				Collaborate/network	CAP
				Open-minded/into new things	A
				Parenting young people/energy	AP
Subject knowledge	C				
Up-to-date research	C				
Teaching skills	CAP				

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	Core Skills	**Sub-skills**
C = Cognitive	**2**	**2**
CA = Cognitive-Affective	1	2
CP = Cognitive-Psychomotor	2	0
A = Affective	**5**	**13**
P = Psychomotor	**1**	**1**
AP = Affective-Psychomotor	2	2
CAP = Cognitive-Affective- Psychomotor	**3**	**4**
Total	**16**	**24**

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APPENDIX D

SIEC-ISBE Conference, Puerto Rico
Summary of a supplementary questionnaire

Core skills		**Supporting skills**		**Attitudes**	
Knowledge	C	Understanding	CA	Open-minded	A
Motivated	A			Big believe in students	A
				Supporting, engaging	AP
				Inspiring	A
Sensitive to new ideas	CA	Open to diversity	CA	Positive	A
Assertive	AP	Technical skills in information system	CP	Supportive	A
To be facilitator	CAP	Analytical skills	CP	Open mind	A
Good rapport with students	AP	Know cultural climate	CAP	Be pleasant at all times	A
Patience	A	Be available to students	AP	Be fair in dealing with students	AP
Updated in knowledge	C	Willing to explain and re-explain topics	A	Be a co-operative and helpful co-worker	CAP
Get to know names quickly	A	Be aware of possible student problems and needs	CA		
Engage students	CAP	Utilize relevant information	CAP	Positive	A
Use relevant technology	CP	IT skills	CP	Respectful	A
Promote critical thinking	CAP	Team building	AP	Discovery	CA
Problem solving	CAP	Decision making	CP		
Flexibility	A	Brave	A	Positive	A
Curious	A	Motivated	A	Support	A
Open minded	A	Knowledge	C	Open attitude	A
				Feedback	CAP

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	Core Skills	**Sub-skills**
C = Cognitive	**2**	**1**
CA = Cognitive-Affective	1	4
CP = Cognitive-Psychomotor	1	4
A = Affective	**6**	**15**
P = Psychomotor	**0**	**0**
AP = Affective-Psychomotor	2	3
CAP = Cognitive-Affective- Psychomotor	**3**	**3**
Total	**15**	**30**

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Appendix E

SIEC Finland members
Summary of a supplementary questionnaire

Core skills		**Supporting skills**		**Attitudes**	
Spontaneity	A	Motivate students	A	Inspiring	A
Experience	CP	Diverse teaching methods	CAP	Motivating	A
Innovativeness	AP			Mastering my field	C
Professional competence in business	C	Social competence	A	Engagement	CAP
Pedagogical content knowledge	C	Present and moderate skills	P	Self-reflection	A
Management	C	Methodological skills	C	Self-dependence	A
Managing information	C	Learning skills	CAP	Positive attitude	A
Commitment to quality	P	Engagement/eye for details	CAP	Motivational attitude	A
Continuous learning	CA	Motivation	A	Flexible attitude	A
Entrepreneurial spirit	CAP	Knowledge of new media	C	Patience	A
Own experience	CP	Good general knowledge	C	Open mindset	A
Intercultural competencies	CAP			Professional	C
Up-to-date business knowledge	CP	Communicate the topics in question	CP	Coaching, not teaching	AP
Pedagogical alternatives in use	CAP	Visualize future opportunities	AP	Inspiring & motivating	A
Cooperation and collaboration	CAP	Motivate and engage	CAP	Committed & interested	AP
Pedagogical competence	CAP	Risk taking	CA	Opportunity centered	A
Substance competence	CAP			Positive outlook	A
Innovative competence	CAP			Flexible	A
Competence in substance	CAP	Capability to adapt	AP	Positive	A
Teaching skills	CAP	Capability to learn new	AP	Cooperative	A
Interaction skills	CAP	Capability to understand different ways of learning	AP	Openness	A
Entrepreneurship talent	CAP	Open mind	A		
Innovativeness	AP	Communicative skills			
Experience in entrepreneurship	CAP	Professional skills	CAP		
Inspiring atmosphere	A	Knowledge	C	Supportive	A
Flexible ways to succeed	AP	Empathy	A	Inspiring	A
Commit to success	P	Understanding different ways	CAP	Enthusiastic learning	CAP
Creating supporting atmosphere	CA	Understand different cultures	CAP	Inspired	A
Be clear and supporting	A	Empathy skills	AP	Ability to listen	A

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Flexible and able to adapt to students' ideas	CAP			Supportive	A
Student centered attitude	A	Questioning and listening skills	AP	Everything I do aims to help the students	A
Versatile teaching methods	CAP			Don't forget the big picture	CAP
Willingness to help learning	CAP	Flexibility/creativity	AP	Open mind	A
Master your field	C	Good examples from real life supporting	C	Positiveness	A
Business	C	Motivation, inspiration	A	Empathy	A
Marketing	C	Supportive	A	Group leading	CP
Communication	CAP	Group dynamic leading	AP	Supporting	A
Teamwork	CAP	Social skills/ updating networks	AP	Guts to understand	A
Entrepreneurship skills	CAP	Leadership skills	CAP	Entrepreneurship	CAP
Business skills	CAP	IT-skills, understanding and training sports	CAP	"long nerves"	A

	Core Skills	**Sub-skills**
C = Cognitive	**7**	**7**
CA = Cognitive-Affective	2	1
CP = Cognitive-Psychomotor	3	2
A = Affective	**4**	**35**
P = Psychomotor	**2**	**1**
AP = Affective-Psychomotor	3	11
CAP = Cognitive-Affective- Psychomotor	**19**	**14**
Total	**40**	**71**

ISSN 2164-2877 (print)
ISSN 2164-2885 (online)

Appendix F

Demographics

Gender	Age	Country	Working area	Years as lecturer	Teaching area
Female	56	United Kingdom	University	30	HRM
Male	51	United Kingdom	University	30	Linguistics
Female	70	Belgium	Retired/coach in EU-projects	53	Economics
Female	58	Austria	University	29	Finance, itercultural communication
Female	43	Belgium	Polytechnic	10	Finace, economics
Male	45	Greece	Polytechnic	15	Marketing
Female	58	Belgium	University	17	Business management
Female	51	Finland	Polytechnic	17	Eentrepreneurship, marketing
Female	50+	Finland	Polytechnic	25	Int. business. languages
Female	48	Finland	Polytechnic	11	Languages, digital business
Female	43	Austria	Polytechnic	14	Business education, business teacher education
Female	70	Germany	Adult college	23	Finnish for foreigners
Female	53	Finland	Vocational	22	Entrepreneurship, health services
Male	58	Finland	Polytechnic	1	Business administration
Female	54	Finland	Vocational	21	Marketing
Female	-	Finland	Polytechnic	29	Chem. technology
Female	-	Finland	Polytechnic	16	Business communication
Male	47	Finland	Vocational	15	Tourism, international business
Male	39	Finland	Vocational	?	Entrepreneurship, international studies
Female	51	Sweden	Vocational	20	Entrepreneurship, business, e-commerce, administration
Female	56	Sweden	Vocational	19	Economics, leadership, marketing, events

ISSN 2164-2877 (print)
ISSN 2164-2885 (online)

Gender	**Age**	**Country**	**Working area**	**Years as lecturer**	**Teaching area**
Female	52	Puerto Rico	University	24	Management
Female	70+	Bahamas	University	48	Business
Female	60+	USA	University	21	Human sciences, personal finance, resource mtg, consumer economics
Female	55	Finland	Vocational	28	Student counseling, leadership skills
Female	44	Finland	Polytechnic	13	Digital Business

	Female Teachers	Male Teachers
Number	21	5
Age	43 – 70	39 – 58
Years as Lecturer	6 – 53	1 – 30

ISSN 2164-2877 (print)
ISSN 2164-2885 (online)

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