The impact of teaching models in higher education on non-creative employment in the Cultural and Creative Industries (CCIs)

DRAFT

Please do not quote or distribute.

Kasper M. Arendt[1], Trine Bille[2], Bo T. Christensen[3], Vibeke Jensen[4], Beatrice Rangvid[5]

ABSTRACT

The cultural and creative industries (CCIs) is considered an important growth sector in the economy, providing innovation and employment. While the creative jobs have been in focus and widely studied, there has been less interest in the non-creative jobs in the CCIs. Business schools are providing general skills which are expected to be important for business development in the CCIs as well as in other industries. Using Copenhagen Business School as a case, we investigate what kind of business school graduates are more prone to be employed in the CCIs. In doing so, we differentiate between 1) course content relating to CCIs and 2) pedagogics, as former studies have shown that teaching models influence students' learning approaches and outcomes. Combining existing knowledge on the needs for special competences in the CCIs, with the expected outcome of different teaching models leads us to our main hypothesis: *Competence teaching models in any higher education business administration program have positive impacts on employment in the CCIs for business graduates.* Our main hypothesis is highly supported. Taking self-section into account by fixing the influence of enrollment into specific program clusters, competence teaching models increase the likelihood of being employed in the CCIs with about 21 percentage points. Furthermore, 24% of the business school graduates are employed in the CCIs 0-4 years after graduation. Our finding can inform educational policy suggesting how to educate for jobs in CCI and similar industries, where the environment is fast changing.

Keywords: Non-creative jobs, creative industries, competence teaching models, higher education, employment.

Note: This work is supported by the Independent Research Fund Denmark [grant number 8108-00031B].

[1] Researcher, PhD, The Danish Centre for Social Science Research (VIVE), Denmark, ksa@vive.dk
[2] Professor, PhD, Department of Business Humanities and Law, Copenhagen Business School, Denmark, tb.bhl@cbs.dk
[3] Professor, PhD, Department of Marketing, Copenhagen Business School, Denmark, bc.marktg@cbs.dk
[4] Senior researcher, PhD, The Danish Centre for Social Science Research (VIVE), Denmark, vmj@vive.dk
[5] Senior Researcher, PhD, The Danish Centre for Social Science Research (VIVE), Denmark, bsr@vive.dk

1. Introduction

The cultural and creative industries (CCIs) are considered an important growth sector in the economy, providing innovation and employment (Jones et al., 2015). Furthermore, it has been shown that the CCI employ highly skilled and highly motivated labor (Lesley et al. 2020).

Employment in the CCIs can roughly be divided into "creative jobs" and "non-creative jobs". Studies have shown that "non-creative jobs" make up a large share of jobs in the creative industries (Nathan et al., 2015). For Denmark, Bille (2006) has shown, based on official register-data from Statistics Denmark, that only 16 percent of those working in the creative industries have a creative job-function, while 44 percent have "non-creative" job functions.[1]

While the creative jobs have been in focus and widely studied, there has been less interest in the non-creative jobs in the creative industries, and how education, skills and capabilities can be important for employment, careers and ultimately the success of the creative firms. One non-creative skill has attracted special attention, namely entrepreneurship. Entrepreneurship and entrepreneurial competences within the CCI have been shown to be important (Hagoort et al., 2012). Creative businesses are often small, and given the high competition in the CCIs, having a creative product alone is not sufficient. It is equally important to be able to create a viable business and effectively bring a creative product to market. In recent years, there has been a focus on enhancing managerial and entrepreneurial competencies for individuals in creative job functions. This is achieved by examining and developing curricula in creative programs at arts schools and universities. There are many practical examples and cases of this as well as some research. These studies are made within the context of creative jobs, and what kinds of additional skills are needed for employment and success in the CCI (e.g. Bridgstock, 2011; Lindsey et al., 2018; Mietzner and Kampath, 2013).

The present study is dealing with non-creative jobs in the CCIs. Business schools are providing more general skills that are expected to be important for business development not only in the CCIs but also in other industries. We use Copenhagen Business School (CBS), one of the largest business schools in Europe with close to 20,000 students, as a case to investigate which types of business school graduates are more likely to be employed in the CCIs. Three different types of study programs can be distinguished:

- General business administration programs
- Entrepreneurship programs
- Programs with special content targeting the CCIs.

The three types of programs are defined by the specific *content* of the programs. In addition, it can be expected that the *pedagogics and how the programs are taught* can have an impact on career choices.

The effect of pedagogy during education has not yet been studied within the context of careers in the CCIs. However, former studies have shown that teaching models influence teaching styles,

[1] For 40 percent their job-functions were unknown.

students' learning approaches, and outcomes (Béchard and Grégoire, 2005). In other words, how you teach matters for learning outcomes, and subsequently students' skills and careers (Lackéus, 2020).

The purpose of this paper is to examine long-term effects of pedagogy and learning methods on employment in the CCIs for business school graduates.

Former research has shown that the CCIs possess some special characteristics (e.g. Jones et al., 2015). Among the most often mentioned characteristics are organization in a network economy with flexible and short-term contracts, advanced used of technology in the production, and global connectedness. Furthermore, they operate under monopolistic competition, and they are often dependent on copyright. In other words, the CCIs are fast changing, innovative and demanding to manage. Therefore, we would expect that non-creative jobs in the CCIs would likewise be demanding and require special competences to be able to handle the challenges.

Furthermore, we anticipate that the special competences needed in the CCIs to a higher degree will be developed, when learning-processes are more self-directed and include real-life learning situations, and when an experiential approach to learning is taken. In the paper, we have therefore included a measure for teaching models to capture whether teaching methods promote creative (learning goals), interpersonal (pedagogy), practice-related (type of knowledge) and self-determined (examination format) competences. These sub-dimensions of competence teaching models are thought to be related to the necessary competences in creative industries.

To address the overall question, our study contrasts the teaching models, adopted by a broad range of two-year master's programs at CBS, to investigate their impacts on employment in the CCIs within the five-year period following students' graduation. We consider teaching models involved in all types of higher education business administration programs, regardless of whether they focus on CCIs, since we expect that the way these programs are taught have implications for the careers of their graduates, regardless of whether the program content relates to CCIs, entrepreneurship or some other business administration field (e.g., marketing, finance, general management, organization, operations).

The paper is organized like this. In the following section we provide the theoretical background for understanding the CCIs and the expected competences needed in these industries, and we define different types of teaching models. This leads us to the development of our main hypotheses. Section 3 describes our data sources and sample, our main variables, and our empirical approach. In section 4 we describe our main findings and results, and section 5 discuss implications of our results and concludes the paper.

2. Theory and hypothesis

In this section we will first define the CCIs and the competences needed in the CCI. This is based on a literature review. Secondly, we will define teaching models and especially the competence

teaching models. This will lead us to our main hypothesis, which is based on the expectation that the competence teaching model will develop the competences needed in the CCIs.

2.1 Competences and employment in the CCIs

The CCIs are normally defined by SIC codes based on an assessment of whether the industries are "creative" or non-creative". After a long period of time, where there were different definitions in different countries (see Bille, 2011), there seems to be consensus on the UK model (see appendix Table A.1 for a definition). In a similar way, employment in the CCIs is typically categorized into "creative" and "non-creative" jobs. Creative jobs are defined based on job functions classified as creative based on ISCO codes (see e.g. Higgs, Cunningham and Bakhshi, 2008 for a definition based on ISCO codes), while non-creative jobs are the residual category. Research interest has been centered around the size of the creative industries in the economy, the contribution and share of creative job within the creative industries (sometimes called creative intensity) as well as within all industries (including non-creative industries, sometimes referred to as embedded jobs). To account for embedded jobs (creative jobs in non-creative industries) dynamic mapping has been introduced (Bakhshi, Freeman and Higgs, 2013). A UK study (Nathan et al., 2015) shows that the jobs in the CCIs constitute 7.58% of all occupations, and within the CCIs the creative intensity is 0.37, which means that 37% of the jobs in the creative industries are classified as creative (see Table 1).

Table 1. Employment in UK, in 1,000, 2011-2013

	Creative industries	Non-creative industries	All industries	Share CCI
Creative occupation	816	570 (embedded jobs)	1,386	
Non-creative occupation	1,405	26,525	27,920	
All occupations	2,221	27,085	29,307	7.58
Creative intensity	0.37			

Source: Nathan, Pratt and Rincon-Aznar (2015)

Previous research has focused on creatives and their competences, contributions, careers, and labor market characteristics. Minimal attention has been given to non-creative jobs in the CCIs and related competences, even though these jobs make up around 2/3 of the employment in these industries.

In general, to adopt a competency approach, it is necessary to create a competency model that describes the minimum list of competences required for a position. According to Marelli et al. (2005) competency is a measurable human capability and is needed to create an effective performance. A competency model can be applied at different levels: for the individual job/position, or for various positions within a specific business or even an industry. If the competency model is applied to an industry, such as the CCIs, it must be assumed that this industry

has some special characteristics, requirements and needs, which is shared among positions in the industry.

Competency is the fundamental characteristic of a person, which can be a motive, a talent, a skill, a self-concept, or supportive knowledge, and which can affect the resulting performance (Aisha et al., 2019, Spencer and Spencer, 1993).

Several studies have already investigated the skills and competences needed for creatives to be successful inside and outside (embedded jobs) the creative industries – beyond their core specialized artistic skills.

Bridgstock (2011) has studied creative graduates from two Australian Universities, with the purpose to find a link between a particular set of skills and graduates' careers and outcomes. She finds that skills related to self-management, career building competences and intrinsic work motivation are important skills for creative graduates to get successful careers in the CCIs and beyond. Likewise, ARC (2007) points towards interpersonal skills, the capacity to manage uncertainty and ambiguity, and certain types of inductive problem-solving ability as valuable skills when in working the CCIs. Recently, Lesley et al. (2020) has developed a new Creative Skills Monitor which aims to provide insight into the skills needed in the CCIs and oversee skills mismatches. The report shows that work in the CCIs is characterized as highly skilled, well-paid and concentrated in higher-level occupations, but with substantial differences between sub-sectors. The skills survey from 2017, which the report is based on, reveals that the biggest skills deficiencies relating to *technical and practical skills* were: Specialist skills or knowledge needed to perform the role, advanced or specialized IT skills, solving complex problems, and knowledge of products and services. When it comes to *soft employability skills*, the most important were: Ability to manage own time and prioritize own tasks, customer handling skills, sales skills, managing or motivating other staff, and persuading and influencing others (p. 21). The study was made within the context of creative jobs.

Lindsey et al. (2018) have studied the skills need for the creative and cultural sector, including all occupations within the CCIs. They find that 33% of the business included in the survey reported skills gaps, and the most common gaps identified were: business marketing and communications skills, problem solving skills, vocational skills relating to business support occupations, fundraising skills and social media skills.

Mietzner and Kamprath (2013) have investigated which competences are essential for creative professionals in the turbulent environment of the CCIs. They present four requirements that call for shifts in the education of competences. Based on a discussion of the requirements, they present a competence portfolio for the CCI along the dimensions of professional, methodological and personal-social competences (see Table 2). The study is based on a literature review as well as a qualitative study, which includes interviews and workshops with industry experts on trends within the CCIs and corresponding demand for competences. The study points to development of curricula and study programs in the education of creative professionals. The study is focusing on creative and not on the non-creative occupations in the CCIs.

Table 2. Competences for creative professionals

Personal-social	Methodological	Professional
Motivation Independence Ability to work in a team Creativity Communication Self-reliance Readiness for action Readiness to learn Discipline Open for change Networked holistic thinking Ability to make decision Innovativeness and optimism Readiness to arrange and initiative Persistence Being aware of consequences and strategic thinking Ability to give and receive criticism	Management of multi- and cross-media projects Strategic, proactive thinking Change management Analysis understanding Scientific methods Connectional strength Ability to assess Ability tor organize Creative methods	IT-competences/dealing with new technologies Sector-based knowledge and multi- and cross-media understanding Practical experience Business administration Legislation/law (IP and copyrights Intercultural understanding Entrepreneurial thinking Innovation management Sector-crossing competence Relation management/network management

Source: Mietzner and Kamparth (2013)

Aisha et al. (2019) has proposed a competency model related to the CCIs. The model is based on a systematic literature review, and it is designed by including three different approached which are commonly used: 1) the educational approach, 2) the psychological approach, and 3) the organizational approach. The resulting competency model is shown in table 3.

Their competency model is targeting SMEs in the CCIs, and it is further refined by looking into which competency areas are need in different positions in the company. Their results show that most of the competency elements are needed by all division in the firm, some are needed by several divisions, and a few are only needed by the management level. There is no division between creative and non-creative jobs. The research shows that the competences are in general needed for most jobs in the CCIs.

Table 3. Competences needed for work in the CCIs

Competency category	Competency areas and elements
Entrepreneurial competences	Achievement (orientation, initiative, seeking opportunities) Personal effectiveness (self-confidence, flexibility, commitment) Cognitive (conceptual thinking, analytical thinking, problem solving)
Managerial competences	Orientation to others (relationship building, customer service orientation, interpersonal understanding) Directing and controlling (leadership, teamwork) Business acumen (innovation management, business functional, project management, knowledge management, change management)
Creative economy context competences	Art and culture (aesthetics, cultural impact, language) Industrial development (product knowledge, cross sector knowledge, intellectual property, technology

Source: Aisha et al. (2019)

While former research has focused on the creative jobs, and the additional personal and technical and professional skills needed in the CCIs, the study by Aisha et al. (2019) shows that there are several competence areas and elements which are important for working in the CCIs, independent on the job position (being it creative or non-creative). The general competences needed are based on the special characteristics, requirements and needs in the CCIs, and therefore also required for non-creative job positions. Even though these competences are slightly differently defined in the different studies, the cover the same elements and Aisha et al. (2019) provides (in our opinion) the most comprehensive overview. The non-creative jobs make up around 2/3 of the occupation in the CCIs, and it expected that theses competences are just as needed in these jobs.

The proposed competency model can be used in academic institutions and universities as a foundation for preparing graduates in accordance with the industry needs. The next relevant question is how to create or develop these competences which are needed.

2.2 The competence teaching model

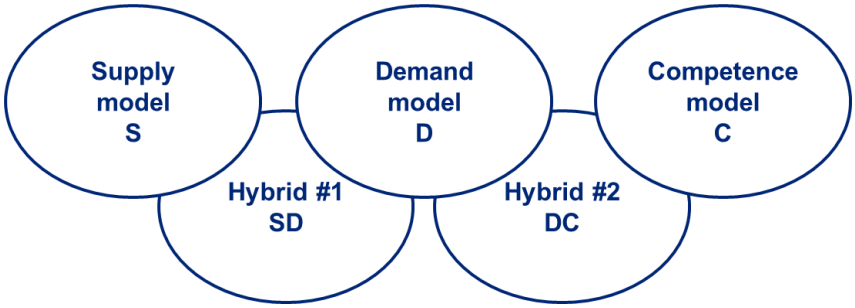
Former studies have shown that teaching models influence students' learning approaches and outcomes. Research on the long-term effects of higher education pedagogy shows that pedagogical interventions and teaching models like problem-based learning (PBL) influence graduates' careers (Béchard and Grégoire, 2005). PBL emphasize structuring knowledge for use in working contexts, developing reasoning strategies and self-directed learning skills, and increase motivation for learning (e.g., Biggs et al., 2022). Therefore, it can be expected that "soft competences" can be develop through e.g. PBL to improve teamwork ability, leadership, decision making, interpersonal understanding and project management. PBL typically applies a competence teaching model.[2]

Teaching models are forms of organization that address specific goals and objectives in certain pedagogical situations, influencing learning outcomes, such as skills and careers (Lackéus, 2020). To

[2] PBL has been shown to impact careers in STEM (Beier et al., 2019; LaForce et al., 2017) and medicine (Albanese and Mitchell, 1993; Tsigarides et al., 2017)

understand the concept of teaching models, Béchard and Grégoire (2005, 2007) has proposed a conceptual framework of five teaching models rooted in prior pedagogy literature: The supply model (S) emphasizing traditional didactics; the demand model (D) focusing on case-oriented work; the competence model (C) featuring real-world and experiential learning situations: the supply-demand (SD) hybrid model blending lectures with cases and applications; and the demand-competence (DC) hybrid model combining cases and applications with real-life experiences, see Figure 1.

Figure 1. Five teaching models



At the operational level, Béchard and Grégoire (2005) has argued that teaching models are anchored in four dimensions that represent their manifest expression: teaching goals, knowledge emphasized, pedagogical methods and means, and forms of evaluation.

They operationalize *competence teaching models* as follows:

- Creative and generative *learning objectives* (versus lower-level objectives, such as to "remember" or "understand" from Bloom's taxonomy) that build competence for developing, designing, and creatively constructing new knowledge.
- Contextualizing *knowledge* to the situation at hand and the actions to be performed, such as knowing how to solve complex problems and mobilize resources (versus focusing on abstract theoretical knowledge), building competence in acknowledging contingencies, addressing situational factors, and preparing for action.
- Collaborative and interactive *pedagogical methods* and means centered on interactions between context, student, and teacher, as well as social learning resources (versus one-way or individual learning) to encourage social competence.
- Using authentic performance *evaluation forms* (versus passive, summative assessment forms) to develop students' self-directed and action-oriented competence in complex, student-managed projects.

It means that teaching models has the potential to develop specific competences: For example, generative learning objectives may foster creativity and coping with uncertainty. Contextualizing knowledge may enhance competences like valuing ideas and learning through experience. Collaborative pedagogies and self-directed exam forms relate to mobilizing and working with others, as well as motivation, perseverance, vision, initiative, planning, and management.

2.3 Hypothesis

The proposition is that the implementation of competence teaching models in any higher education programs can impact graduates' competences and careers. Constructive learning objectives, contextualized knowledge, collaborative pedagogies, and self-directed exam forms could enhance certain learning outcomes and competences in any program.

Combining the knowledge of the needs for special competences in the CCIs (see section 2.1), with the potential of the competency teaching model to develop the needed skills, we reach our main hypothesis:

H_0: Competence teaching models in any higher education business administration program have positive impacts on employment in the CCIs for business graduates.

This is based on the expectation that the competence teaching model will develop the competences needed in the CCIs, as explained above.

3. Data and methods

In this section we will describe our sample and data sources, followed by a description of our main variables: the outcome variable, our main variable of interest, namely our teaching model score (TCM) and how it is developed, and our controls. In the end of the section, we describe our empirical approach.

3.1 Data sources and sample

The data set for this study originates from multiple data sources. We have combined administrative records from all two-year master's programs at Copenhagen Business School (CBS) with labor market and socio-demographic databases from Statistics Denmark. CBS has 37 master's programs divided into seven program clusters: general management; finance and economics; innovation and entrepreneurship; marketing; digitalization and operations; leadership and organization; and linguistics (see the appendix Table A.2 for an overview). Using unique program identifiers (IDs), course IDs, and student IDs, we linked business school programs and course information to the sample of graduates from 2013–2015. We then tracked their progress during their master's programs and followed them into the labor market for a period of 5 years after graduation. Approximately 6,500 students graduated during this period.

The analyses are based on a reduced sample to mitigate the influence of noise induced by student heterogeneity. We excluded graduates who lacked a previous association with an educational institution in Denmark (from primary school through to bachelor program), to ensure a certain level of familiarity with the national educational system and labor market. Thus, we aimed to increase the likelihood of capturing the effects of teaching models rather than unmeasured confounds. We also excluded people who spent more than 5 years on their two-year master's program (<2%) and those older than 35 years at the time of graduation (<1%). As a result, our final analysis sample consisted of 4,717 students. Course descriptions for courses taken by students in the sample were collected and categorized them according to the teaching model applied (see below).

In the analysis we distinguish between three types of graduates: 1) All graduates (N = 4,704), 2) Graduates from innovation and entrepreneurship (IE) programs (N = 304), and 3) Graduates from a special graduate program targeting the CCIs, namely Management of Creative Business Processes (CBP) (N = 80).

This rich and unique data is suitable for investigating the impact of teaching models on employment in the CCIs addressing methodological challenges. It enables capturing teaching models for CCI and non-CCI programs, thus disentangling effects of 1) course content and 2) pedagogy.

3.2 Variables

Outcome measure

The outcome measure is employment in the CCIs, and we are using DCMS's definition of the CCIs based on SIC codes (Nathan et al., 2015). See Table A.1 in the appendix.

Classification of teaching models

Based on the work by Béchard and Gregoire (2005), a coding scheme for teaching models has been developed. The coding scheme was developed in Arendt et al. 2024 and will be summarized here. [3]

The coding scheme considers four operational dimensions namely 1) learning objectives, 2) forms of evaluation, 3) knowledge emphasized, and 4) pedagogical methods and means. Each operational dimension was coded separately based on unique and non-overlapping information from online course descriptions. The coding of each operational dimension resulted in a specific code for the type of teaching model (S, D, C).

Regarding *learning objectives*, a keyword search of the course description was conducted, applying Bloom's taxonomy of educational objectives (Biggs and Kennedy, 2020). Educators are required to adopt this typology when formulating learning objectives. "Evaluate" and "create" related keywords were coded C; "apply" and "analyze" were coded D; and "knowledge" and "understand" as S.

For classifying *forms of evaluation*, the business school's own typology of exam formats was used, indicating C for formats like academic papers and large projects, D for case-based exams and oral exams based on written material, and S for written or oral exams without preparation.

Knowledge emphasized was classified as S if emphasis was put on abstract theory (e.g., introductory law, auditing), D if courses provided applied knowledge (e.g., methods, courses on regional politics), and situated, contextualized knowledge, and resource mobilization as C (e.g., project and problem-based learning, internships).

Pedagogical methods and means classification averaged three subdimensions: activities, teacher role, and student role. Activities like lectures and readings were coded S, exercises and group work as D, and workshops, field trips, and venture creation activities as C. Teacher roles were classified as S for one-way format knowledge dissemination, D for facilitating learning processes or involving industry guest lecturers (D), and C for acting as coaches engaged in knowledge co-creation.

[3] This section draws heavily on Arendt et al. (2024).

Student roles were classified as S for primarily individual work, D for assignments of self-chosen topics, and C for interactive, intensive project work.

Based on the above described four operational dimensions, an overarching teaching model score (TMS) was established. Each of the four dimensions weighed equally. To calculate the numerical TMS for each course, the four subdimensions were averaged, assigning scores as follows: S = -1, D = 0, and C = 1. TMS was then aggregated to the program level. The program-level TMS was calculated using only mandatory courses and assigned weights based on course credits. In total, graduates in the sample attended 885 different courses.[4]

On average, each program consists of 7 mandatory courses, with a minimum of 3 and a maximum of 13 courses. Two programs with very large proportions (two-thirds or more) of semester credits assigned to a single mandatory course were excluded; these large courses would unduly skew the TMS at the program level.

Controls

To account for CCI content and prior knowledge, we include an indicator for CCI electives as a control. Using a 7.5-credit cut-off, the elective standard, we indicate enrollment in at least one CCI elective. Furthermore, we have included an indicator of whether the graduate has worked in the CCI before graduation. These indicators address potential biases by identifying students with particular CCI interests. Accounting for voluntary CCI participation and previous experience is crucial in assessing effects of teaching models and minimizing self-selection biases.

Additionally, a range of socio-demographic characteristics are included as control variables: gender, ethnicity, marital status, age, disposable income during education, age at entry to education, parents' educational level, as well as whether one of the parents have an education related to CCIs. For most students, these variables were measured upon their entry to the program. Furthermore, the administrative register also enables us to control for parental experiences with CCI, such as whether at least one of the parents have an education related to CCI or is employed in the CCIs.

3.3 Empirical approach

The empirical model is specified using a linear probability model (LPM) with fixed effects to estimate the average effects of (competence) teaching models on employment in CCIs.

To address potential self-selection problems, LPM was augmented by introducing fixed effects at the program cluster level, encompassing seven clusters according to the main topics of the 35 programs. Fixed effects regression helps mitigate the influence of unobserved factors by holding them constant, effectively controlling for average differences between program clusters. By

[4] The reliability of the TMS was tested in two ways. First, an independent evaluator coded 20 randomly selected course descriptions in terms of learning objectives and formats of evaluation. The intraclass correlation between the two sets of codes is very high, at .91 (Koo and Li, 2016). Second, another rater scored 51 randomly selected courses in terms of knowledge emphasized and pedagogical methods. The interrater reliability score (Cohen's kappa) was .66 overall, and similarly high for all four subdimensions: knowledge emphasized (.64), activities (.72), teacher role (.71), and student role (.71). Kappa values above .60 indicate substantial to nearly perfect agreement (Blackman and Koval, 2000). Together, these interrater reliability checks indicate good consistency of our classification of teaching models. See Arendt et al. (2024).

addressing concerns related to self-selection into programs with similar teaching models and content, the impacts of teaching models can be assessed more accurately, and confounding factors minimized.

The empirical model builds on an assumption that students choose their master's programs based on relevant parameters, such as whether it was a direct continuation of their completed bachelor's program, interest in the subject matter and career prospects, or legal claims to admittance, rather than the specific teaching models applied in mandatory courses. Thus, we used the following specification:

$$FC_{ij} = \alpha + \beta_1 TMS_{ij} + \beta_2 CCIEL_{ij} + \beta_3 controls_{ij} + \theta_j + e_{ij}$$

where FC denotes of the probability of employment in the CCIs by student i in program j, and TMS denotes Teaching Model Score within the range [-1 to 1]. The coefficient β_1 represents the average treatment effect of increasing TMS one unit (i.e., from "demand" to "competence" teaching models) on the likelihood of being employed in the CCIs. CCIEL is a dummy for whether student i has participated in a CCI elective. Controls describe the combined set of control variables used, including gender, ethnicity, marital status, age, disposable income deciles, graduation year, and parent's experiences with the CCIs. Finally, θ represents program cluster fixed effects, capturing unobserved heterogeneity at this level, and e captures residual variation.

4. Results

In this section we report our main results.

4.1 Descriptive statistics

Table 4 contains descriptive statistics for alle included variables. The first column lists average values across all program clusters, the second column specifies descriptive statistics of innovation and entrepreneurship programs (IE), and the last column shows the results for the specific CCI program (CBP).

An important finding is that a notable high percentage of business school graduates are employed in the CCIs, with an average across programs of 24% within 0-4 years after graduation. Notably, CBP graduates are most likely to be employed within the CCIs with 50%, whereas for IE graduates the average is 33%. When considering the period of 0-2 years after graduation, the numbers are slightly lower, indicating that a higher percentage of graduates enter the CCIs over time.

Furthermore, 28.6% of IE graduates and 27.5% of CBP graduates enrolled in a CCI elective, compared to the average enrollment rate across all programs of 8%. 6,6% of the CBP graduates has previous been employed in the CCIs, compared to 5,0% of the IE graduates and 3,1% of all graduates from CBS.

Table 4. Summary Statistics

	(1) All mean/sd	(2) IE mean/sd	(3) CBP mean/sd
Creative Business year 0-4	0.241	0.332	0.500
	(0.428)	(0.472)	(0.503)
Creative Business year 0-2	0.206	0.280	0.463
	(0.405)	(0.450)	(0.502)
(mean) CCIpre	0.031	0.050	0.066
	(0.078)	(0.117)	(0.092)
Teaching model	-0.168	-0.061	-0.075
	(0.254)	(0.139)	(0.000)
CCI elective	0.080	0.286	0.275
	(0.272)	(0.453)	(0.449)
Female	0.499	0.507	0.700
	(0.500)	(0.501)	(0.461)
Ethnic majority	0.838	0.783	0.787
	(0.369)	(0.413)	(0.412)
Cohabiting/married	0.651	0.697	0.750
	(0.477)	(0.460)	(0.436)
Age at edu entry	24.456	24.812	24.875
	(2.026)	(2.168)	(1.925)
disposable income during edu	5.927	5.273	5.700
	(2.614)	(2.519)	(2.558)
Grad.year 2013	0.330	0.312	0.350
	(0.470)	(0.464)	(0.480)
Grad.year 2014	0.329	0.359	0.287
	(0.470)	(0.480)	(0.455)
Grad.year 2015	0.341	0.329	0.362
	(0.474)	(0.471)	(0.484)
Mother, tertiary education	0.452	0.484	0.463
	(0.498)	(0.501)	(0.502)
Father, tertiary education	0.399	0.414	0.425
	(0.490)	(0.493)	(0.497)
Parent, CCI education	0.019	0.026	0.037
	(0.136)	(0.160)	(0.191)
Parent, CCI employed	0.087	0.099	0.138
	(0.282)	(0.299)	(0.347)
N	4704	304	80

Examining the sub-industries of the CCIs, the first two columns of Table 5 show how the 24% of CBS graduates working in the CCIs are dispersed among sub-CCI industries. The first column

represents the percentage of all CBS graduates, while the second column represents the percentage of CBS graduates with a job in the CCI. For comparison, column 3 and 4 shows the same distribution for all employment in Denmark. The comparison reveals some interesting findings. Firstly, while 24% of CBS graduates are employed in the CCIs, this is only the case for 3.5% of the employment in Denmark.

Secondly, the distribution among sub-CCI industries is not exactly the same for CBS graduates as for the overall employment in Denmark (DK) as a whole. CBS graduates are to a larger extent represented in advertising and communication, software and consultancy, and book publishing.

Tabel 5. Percentage of employment in CCI (CBS and Denmark (DK))

SIC codes		Percent of CBS employment*	% of all CCI* CBS	Percent of all employment DK**	% of all CCI DK**
73.11-73.12 70.21	Advertising agencies. PR and communication activities.	4.19	17.34	0.16	4.48
71.11	Architectural activities.	0.34	1.41	0.21	5.81
74.1	Specialized design activities.	0.94	3.87	0.19	5.25
59.11+59.12+ 59.13+59.14 60.1 60.2 74.2	Motion picture, video and TV program activities. Radio broadcasting. Tv programming and broadcasting activities. Photographic activities.	2.00	8.27	0.46	12.99
58.21+58.29 62.01+62.02	Software publishing. Computer programming and consultancy activities.	10.95	45.33	1.39	39.38
58.11+58.12+ 58.13+58.14+ 58.19 74.3	Publishing of books and periodicals. Translation and interpretation activities.	4.00	16.55	0.42	11.9
59.2 90.01+90.02+ 90.03+90.04	Sound recording and music publishing activities. Creative arts and entertainment activities.	1.23	5.11	0.34	9.67
85.52	Cultural education.	0.09	0.35	0.08	2.21
91.0 1+91.02	Libraries, archives, museums activities.	0.43	1.76	0.29	8.31
	Outside CCI industries	75.85	0	96.47	0
	No. of observations	4,704	1,136	3,406,907	120,337

* CBS graduates born between 1980-2000 and graduated in 2013-2015. If more than one CCI activity within the four-year period, the first CCI activity is measured.

** Employment measured in 2019 for all persons born between 1980-2000, their parents, siblings and partners.

4.2 Main findings

In table 6 we explore the relationship between competence teaching models and the likelihood of being employed in the CCIs. To address self-selection into specific program educational types, we employ fixed effects at the program cluster level. This approach provides a means to mitigate the influence of unobserved factors associated with enrollment in specific program clusters, such as program diversity, mandatory courses, and student characteristics.

Table 6. Hierarchical regression: Effects of TM on CCI, all program clusters

	(1) OLS U/covar	(2) OLS+CCIE lec	(3) OLS+Covar	(4) OLS +CBP	(5) FE+ ALL COVAR
Teaching model	0.401***	0.389***	0.402***	0.399***	0.212**
	(0.060)	(0.063)	(0.060)	(0.061)	(0.070)
CCI elective		0.069	0.070*	0.061	0.053*
		(0.035)	(0.033)	(0.030)	(0.026)
Female			0.000	-0.003	-0.028
			(0.022)	(0.022)	(0.016)
Ethnic majority			0.068***	0.069***	0.057**
			(0.018)	(0.018)	(0.018)
Cohabiting/married			0.007	0.006	0.008
			(0.014)	(0.013)	(0.013)
Age at education entry			-0.003	-0.004	-0.007
			(0.005)	(0.004)	(0.004)
Disposable income during education			0.009*	0.008*	0.009**
			(0.003)	(0.003)	(0.003)
Grad.year 2014			0.000	0.001	0.003
			(0.015)	(0.014)	(0.015)
Grad.year 2015			0.014	0.014	0.020
			(0.016)	(0.016)	(0.015)
Mother, tertiary education			0.010	0.010	0.010
			(0.014)	(0.015)	(0.014)
Father, tertiary education			0.006	0.005	0.010
			(0.013)	(0.013)	(0.013)
Parent, CCI education			0.069	0.067	0.061
			(0.046)	(0.046)	(0.045)
Parent, CCI employed			0.049*	0.047*	0.044*
			(0.022)	(0.021)	(0.021)
CBP program				0.216***	0.231***
				(0.017)	(0.041)
Constant	0.309***	0.301***	0.251	0.260	0.326**
	(0.024)	(0.026)	(0.133)	(0.131)	(0.109)

Observations	4704	4704	4704	4704	4704

Standard errors (in parentheses) are adjusted for 35 program clusters.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Across all programs (Model 1), competence teaching models increase the likelihood of being employed in the CCIs with about 40 percentage points due to a one-unit change in TMS (e.g. applying a competence rather than a demand teaching model). Adding a dummy for a CCI elective (Model 2), does not change the overall result, and a CCI elective turns out to be insignificant.

When accounting for sociodemographic controls in Model 3, the impact is unchanged both without and with an indicator for CBP (Model 4). Model 4 shows that graduating from the CBP program increases the likelihood of being employed in the CCIs with 22 percentage points.

Model 5 adds program cluster fixed effect. Here, we still find a significant relationship between teaching models and employment in the CCIs, but after fixing the influence of enrollment into specific program clusters, the estimated effect of teaching models is reduced to 21 percent point. It shows the importance of addressing self-selection into program clusters. The rest of the variables remain largely unchanged.

The sociodemographic variables which have turned out to be positive correlated with being employed in the CCIs are ethnic majority (Danish nationality) and higher disposable income during education. Both variables may be important because the CCIs can entail risk, with many short project contracts and less stability (see section 2.1). A higher disposable income during education, as well as being of Danish nationality, suggests that graduates are well-established and integrated in Danish society with higher income (e.g. from a student job) and possibly a better network. This provides a secure foundation, from which they may be more inclined to take a job in more risky businesses like the CCIs, compared to their peers without these characteristics.

The highly positive estimates for teaching models in in all our specifications indicate substantial effects on the likelihood of being employed in the CCIs. This finding provides substantial support for our main hypothesis.

5. Discussion and conclusion

The purpose of this paper was to examine long-term outcomes of pedagogy and learning methods on employment in the CCIs for business school graduates. Our study reaches some interesting findings and results.

Firstly, 24% of the business school graduates are employed in the CCIs 0-4 years after graduation. Not surprisingly, CBP graduates (a CCI program) are most likely to be employed within the CCIs with 50%, whereas for IE (innovation and entrepreneurship graduates the average is 33%. 24% is a surprising high percentage compared to that in Denmark 3.5% are employed in the CCI.

Secondly, our main hypothesis, exploring the relationship between competence teaching models and the likelihood of being employed in the CCIs, is highly supported. Taking self-section into account by fixing the influence of enrollment into specific program clusters, competence teaching models increase the likelihood of being employed in the CCIs with about 21 percentage points due

to a one-unit change in TMS (e.g. applying a competence rather than a demand teaching model). This is the case across all programs.

We show that competence teaching models (emphasizing learner-centric, situated, authentic and experiential approaches to learning) positively increase chances of employment in the CCIs. The competence teaching model is strongly associated with the competences needed in the CCIs, and thereby it has an impact on graduates' career choices.

Responding to political agendas for economic growth and development, competence teaching models can be integrated into existing courses and programs both at arts universities and other universities to cater for labor market needs in the CCIs and beyond. Current labor market trends shows that other industries are increasingly requiring skills and competences equal to what we have seen in the CCIs. Our finding can therefore inform educational policy suggesting how to educate for jobs in CCI and similar industries, where the environment is fast changing.

Furthermore, it is interesting that 24% of the business school graduates are employed in the CCIs. This taps into the questions of the importance of specific CCI content related knowledge versus softer personal-social competences which are enhanced by competence teaching models. Attending the CBP program as well as a CCI elective are significant in our final specification. This points in the direction of the importance of content specific knowledge combined with competence teaching models. Business schools have in general very few courses directed at the CCI, which can come a surprise since 24% of the graduates in our case, are employed in these industries.

References

Albanese, M.A. and Mitchell, S. (1993), "Problem-based learning: A review of literature on its outcomes and implementation issues", *Academic Medicine*, LWW, Vol. 68 No. 1, pp. 52–81.

Arendt, K. M., B. T. Christensen, V. Jensen, B. Rangvid and T. Bille (2024): Beyond entrepreneurship education: The long-term impact of higher education teaching models on new venture creation.

Aisha, A.N., I. Sudirman, J. Siswanto and M. Andriani (2019): A competency model for SMEs in the creative economy, *International Journal of Business*, 24(4).

ARC Centre of Excellence for Creative Industries and Innovation (2007*): Educating for the Creative Workforce: Rethinking arts and education,* report for Australia Council for the Arts, Australia Council for the Arts, Sydney.

Bakhshi, H., A. Freeman and P. Higgs (2013*): A dynamic mapping of the UK's creative industries, Nesta*, London.

Béchard, J. P., & Grégoire, D. (2005). "Understanding teaching models in entrepreneurship for higher education". In P. Kÿro, & C. Carrier (Ed.), *The dynamics of learning entrepreneurship in a cross-cultural university context*: 104–134, University of Tampere.

Béchard, J. and Grégoire, D. (2007), "Archetypes of pedagogical innovation for entrepreneurship in higher education: Model and illustrations", in Fayolle, A. (Ed.), *Handbook of Research in Entrepreneurship Education: A General Perspective*, Vol. 1, Edward Elgar Publishing, Massachusetts, pp. 261–284.

Beier, M.E., Kim, M.H., Saterbak, A., Leautaud, V., Bishnoi, S. and Gilberto, J.M. (2019), "The effect of authentic project-based learning on attitudes and career aspirations in STEM*", Journal of Research in Science Teaching*, Wiley Online Library, Vol. 56 No. 1, pp. 3–23.

Biggs, J., Tang, C., & Kennedy, G. (2022). *Teaching for Quality Learning at University*, 5th edition. McGraw-Hill education (UK).

Bille, T. (2006): Creative labor: Who are they? What do they do? Where do they work? A discussion based on a quantitative study from Denmark, In: C. J. Mathieu (ed.*): Careers in the creative industries*, Routhledge, pp 36 – 65.

Bille, T. (2011): Bille, Trine (2011): The Scandinavian approach to the Experience Economy – does it make sense?, *International Journal of Cultural Policy,* vol. 18, no.1, pp. 93-110

Bridgstock, R. (2011): Skills for creative industries graduate success, *Education + Training*, 53(1), pp 9-26.

Blackman, N.J.M. and Koval, J.J. (2000), "Interval estimation for Cohen's kappa as a measure of agreement", *Statistics in Medicine*, Vol. 19 No. 5, pp. 723–741, doi: 10.1002/(SICI)1097-0258(20000315)19:5<723::AID-SIM379>3.0.CO;2-A.

Haggort, G., A. Thomassen and R. Kooyman (ed.): *The entrepreneurial Principles of the Cultural and Creative Industries*.

Higgs, P., S. Cunningham and H. Bakhshi (2008): *Beyond the creative industries: Mapping the creative economy in the United Kingdom*, Nesta, London.

Koo, T.K. and Li, M.Y. (2016), "A Guideline of Selecting and Reporting Intraclass Correlation Coefficients for Reliability Research", *Journal of Chiropractic Medicine*, Elsevier USA, Vol. 15 No. 2, pp. 155–163, doi: 10.1016/j.jcm.2016.02.012.

Lackéus, M. (2020). Comparing the impact of three different experiential approaches to entrepreneurship in education. *International Journal of Entrepreneurial Behavior & Research*, 26(5), 937–971.

LaForce, M., Noble, E. and Blackwell, C. (2017), "Problem-based learning (PBL) and student interest in STEM careers: The roles of motivation and ability beliefs", *Education Sciences*, MDPI, Vol. 7 No. 4, p. 92.

Lesley, G., M. Spilsbury and H. Carey (2020): *Workplace perspectives: skills needs, mismatches and development in the creative industries*, Creative Industries Policy & Evidence Centre, NESTA, London.

Lindsey, B. et al. (2018): *Skills needs assessment for the creative and cultural sector*, CFE Research, Leicester.

Marrelli, A. F., J. Tondora and M. A. Hoge (2005): Strategies for developing competency models, *Administration and policy in mental health and mental health services research,* 32 /5-6), 533-561.

Mietzner, D. and M. Kamprath (2013): A competence portfolio for professionals in the creative industries, *Creativity and innovation management*, 22(3).

Nathan, M., A. Pratt and A Rincon-Aznar (2015): Creative Economy Employment in the EU and UK: A Comparative Analysis, London: Nesta.

Jones, C., M. Lorenzen and J. Sapsed (2015): *The Oxford Handbook of Creative Industries*, Oxford University Press

Spencer, L.M. and S.M. Spencer (1993*): Competence at work: Models for superior performance*, John Wiley and Sons, United States.

Tsigarides, J., Wingfield, L.R. and Kulendran, M. (2017), "Does a PBL-based medical curriculum predispose training in specific career paths? A systematic review of the literature", *BMC Research Notes*, Springer, Vol. 10, pp. 1–9.

Appendix

Table A.1 Definition of the CCI based on SIC codes

SIC			
Code	**Description**		
58.1	Publishing of books, periodicals and other publishing activities, to include		
		58.11	Book publishing
		58.12	Publishing of directories and mailing lists
		58.13	Publishing of newspapers
		58.14	Publishing of journals & periodicals
		58.19	Other publishing activities
58.2	Software publishing, to include		
		58.21	Publishing of computer games
		58.29	Other software publishing
59.1	Motion picture, video and television programme activities, to include		
		59.11	Motion picture, video & TV programme production activities
		59.12	Motion picture, video & TV programme post-production activities
		59.13	Motion picture, video & TV programme distribution activities
		59.14	Motion picture projection activities
59.2	Sound recording & music publishing activities		
60	Programming and broadcasting activities, to include		
		60.1	Radio broadcasting
		60.2	TV programming & broadcasting activities
62.01	Computer programming activities		
62.02	Computer consultancy activities		
70.21	PR & communication activities		
71.11	Architectural activities		
73.1	Advertising, to include		
		73.11	Advertising agencies
		73.12	Media representation
74.1	Specialised design activities		
74.2	Photographic activities		
74.30	Translation and interpretation activities		
85.52	Cultural education		
90.0	Creative, arts and entertainment activities, to include		
		90.01	Performing arts
		90.02	Support activities to performing arts
		90.03	Artistic creation
		90.04	Operation of arts facilities
All			

Table A.2 Program clusters at CBS.

	General Management	Finance and Economics	Markets and Society	Leadership and Organisation	Digitalisation and Operations	Innovation and Entrepreneurship
Cand. merc.	New cand. merc. International Marketing and Management International Business Finance and Strategic Management	Finansiering og Regnskab Finance and Investments Applied Economics and Finance Accounting, Strategy and Control	Økonomisk markedsføring Sales Management Brand and Communications Management	People and Business Development Strategy, Organisation and Leadership	Supply Chain Management	Management of Innovation and Business Development
Integrated	cand. merc. (jur.)	cand. oecon cand. merc. aud. cand. merc. (mat.)	International Business and Politics	cand. merc. (psyk.) MSc (phil.) cand. merc. (kom.) BLC – Business and Development Studies BLC – Diversity and Change	e-business Data Science Information Systems	Innovation in Health Care Bioentrepreneurship
Cand. soc.			Politisk Kommunikation og Ledelse Public Management and Social Development	Human Resource Management	AO in Sustainable Tourism and Hospitality Management	Creative Business Processes Organisational Innovation and Entrepreneurship Strategic Design and Entrepreneurship