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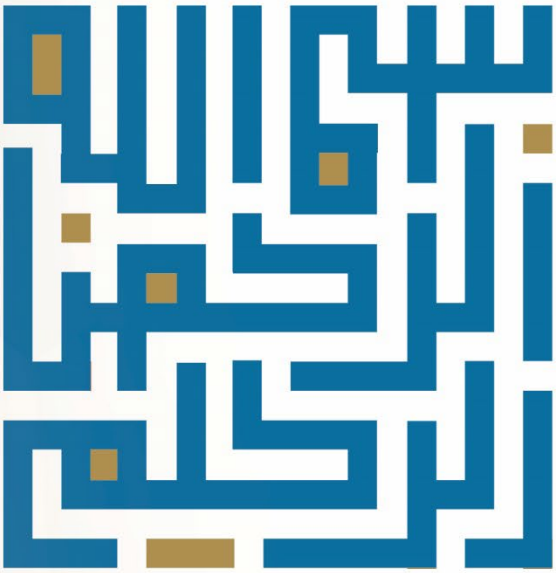

قواعد وضوابط النشر في المجلة

- أن يتسم البحث بالأصالة والجدية والابتكار والإضافة المعرفية في التخصص.
- لم يسبق للباحث نشر بحثه.
- أن لا يكون مستلاً من أطروحة الدكتوراه أو الماجستير سواء بنظام الرسالة أو المشروع البحثي أو المقررات.
- أن يلتزم الباحث بالأمانة العلمية.
- أن تراعى فيه منهجية البحث العلمي وقواعده.
- أن لا تتجاوز نسبة الاقتباس في البحوث التربوية (25%)، وفي غيرها من التخصصات الاجتماعية لا تتجاوز (40%).
- أن لا يتجاوز مجموع كلمات البحث (12000) كلمة بما في ذلك الملخصين العربي والإنجليزي وقائمة المراجع.
- لا يحق للباحث إعادة نشر بحثه المقبول للنشر في المجلة إلا بعد إذن كتابي من رئيس هيئة تحرير المجلة.
- أسلوب التوثيق المعتمد في المجلة هو نظام جمعية علم النفس الأمريكية (APA) الإصدار السابع، وفي الدراسات التاريخية نظام شيكاغو.
- أن يشتمل البحث على : صفحة عنوان البحث، ومستخلص باللغتين العربية والإنجليزية، ومقدمة، وصلب البحث، وخاتمة تتضمن النتائج والتوصيات، وثبت المصادر والمراجع، والملاحق اللازمة مثل: أدوات البحث، والموافقات للتطبيق على العينات وغيرها؛ إن وجدت.
- أن يلتزم الباحث بترجمة المصادر العربية إلى اللغة الإنجليزية.
- يرسل الباحث بحثه إلى المجلة إلكترونيًا ، بصيغة (WORD) وبصيغة (PDF) ويرفق تعهدًا خطيًا بأن البحث لم يسبق نشره ، وأنه غير مقدم للنشر، ولن يقدم للنشر في جهة أخرى حتى تنتهي إجراءات تحكيمه في المجلة.
- المجلة لا تفرض رسوما للنشر.

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ISLAMIC UNIVERSITY OF MADINAH

فهرس المحتويات : ❋

❋ ترتيب الأبحاث حسب تاريخ ورودها للمجلة مع مراعاة تنوع التخصصات

الجامعة الإسلامية بالمدينة المنورة

ISLAMIC UNIVERSITY OF MADINAH

Quality of entrepreneurial education: A Comparative empirical study between King Abdullah University of Science and Technology in KSA and University of California in the USA

جودة تصميم برامج تعليم ريادة الأعمال: دراسة تجريبية مقارنة بين جامعة الملك عبد الله للعلوم والتكنولوجيا في المملكة العربية السعودية وجامعة كاليفورنيا في الولايات المتحدة الأمريكية

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Abstract

The objective of this study is to empirically compare the extent to which program quality factors are replicated in the output level of entrepreneurial education programs at the University of California (hereafter، UC) and King Abdallah University of Science and Technology (hereafter، KAUST). The study used the comparative descriptive approach and content analysis to compare the quantitative specifications based on a model developed in (Bilbokaitė-Skiauterienė & Bilbokaite، 2018) where the quality of study programs is explained several variables: learning outcomes، learning resources، Course content، academic staff، assessment process، and program management. The study shows that though the explanatory variable of program management is significantly well-pronounced in both universities، the study variable of the quality of entrepreneurial education is mainly driven by learning outcomes at UC and by learning resources and facilities at KAUST. Moreover، except for learning resources at UC and academic staff at KAUST، other quality variables of study programs were shown to be replicated in both universities in accordance with theoretic predications. This may suggest that، whereas UC may improve the quality of its entrepreneurial education by augmenting learning resources and facilities، KAUST may benefit from UC's experience in terms of academic staff and the formulation of learning outcomes.

Keywords: Entrepreneurship، Entrepreneurial University، King Abdullah University of Science and Technology، University of California، Saudi Arabia، United States of America

المستخلص

الهدف من هذه الدراسة هو المقارنة التجريبية لمدى تكرار عوامل جودة تصميم البرامج في مستوى مخرجات برامج تعليم ريادة الأعمال في جامعة كاليفورنيا يشار إليها فيما بعد باسم (UC) وجامعة الملك عبد الله للعلوم والتكنولوجيا يشار إليها فيما بعد باسم (KAUST) . اتبعت الدراسة المنهج الوصفي المقارن وتحليل المحتوى واستخدمت المواصفات الكمية بناءً على نموذج تم تطويره في (Bilbokaitė-Skiauterienė & Bilbokaite، 2018) حيث يتم شرح جودة البرامج الدراسية من حيث نتائج التعلم ومصادر التعلم و محتوى المقررات، والموظفين الأكاديميين وعملية التقييم وإدارة البرنامج. تُظهر الدراسة أنه على الرغم من أن متغير إدارة البرنامج يعد واضح في كل من الجامعتين، إلا أن متغير الدراسة يعد مدفوع أساسًا بنتائج التعلم في جامعة كاليفورنيا وموارد التعلم والمرافق في جامعة الملك عبد الله. علاوة على ذلك، وباستثناء موارد التعلم في جامعة كاليفورنيا والموظفين الأكاديميين في جامعة الملك عبد الله، تم تكرار متغيرات الجودة الأخرى لبرامج الدراسة في كلا الجامعتين وفقًا للتنبؤات النظرية. قد يشير هذا إلى أنه في حين أن جامعة كاليفورنيا قد تحسن جودة تعليم ريادة الأعمال من خلال زيادة موارد ومرافق التعلم، فقد تستفيد جامعة الملك عبد لله من خبرة جامعة كاليفورنيا فيما يتعلق بالطاقم الأكاديمي وصياغة نتائج التعلم.

الكلمات المفتاحية: ريادة الأعمال، جامعة ريادة الأعمال، جامعة الملك عبد الله للعلوم، جامعة كاليفورنيا، المملكة العربية السعودية، الولايات المتحدة الأمريكية.

Introduction:

Entrepreneurial education reflects the role of entrepreneurship as a vital social invention to create employment opportunities and enhance the efficiency of the labor market and the productivity of the economy as a whole (Kim, Ryoo، and Ahn, 2017). The premise of entrepreneurial education is that the significance of entrepreneurship، as well as the skills and aptitudes necessary to become an entrepreneur، can be conveyed through formal training (Byun et al.، 2018). This is evident in the growing global trend of increased government funding with respect to entrepreneurship education (Walter and Block، 2016). Indeed، formal entrepreneurship education is crucial in equipping students with the knowledge base and differential abilities necessary to locate and create opportunities for themselves as business owners، as well as the capacity to launch innovative ideas and effectively have them materialized (Licha and Brem، 2018; Daud et al.، 2011). As a result، universities and academic institutions have strongly emphasized the importance of comprehensive and formal entrepreneurial education (Gamede and Uleanya، 2019). Capitalizing on entrepreneurial education، universities typically design entrepreneurship academic programs and training courses so as to motivate and inspire students to engage in entrepreneurial endeavors (Shinnar، Hsu، and Powell، 2014). However، the extent to which program design quality factors are replicated in the output level of entrepreneurial education programs is still largely contentious (Coleman and Robb، 2012; Haara and Jenssen، 2016). In this view، the objective of this study is to empirically compare the extent to which program design quality factors are replicated in the output level of entrepreneurial education programs at the University of California (hereafter، UC) and King Abdallah University of Science and Technology

(hereafter، KAUST). The study used the comparative descriptive approach and content analysis to compare specifications based on a model developed in (Bilbokaitė-Skiauterienė & Bilbokaite، 2018) where the quality of study programs is explained in several variables: learning outcomes، learning resources، course content، academic staff، assessment process، and program management. Toward this end، the study advances the following research questions:

RQ1: what is the impact of the quality factor of learning outcomes on the output level of entrepreneurship study program at each university?

RQ2: what is the impact of the quality factor of learning resources on the output level of entrepreneurship study program at each university?

RQ3: what is the impact of the quality factor of course content on the output level of entrepreneurship study program at each university?

RQ4: what is the impact of the quality factor of academic staff on the output level of entrepreneurship study program at each university?

RQ5: what is the impact of the quality factor of assessment process on the output level of entrepreneurship study program at each university?

RQ1: what is the impact of the quality factor of program management on the output level of entrepreneurship study program at each university?

The rest of the study is organized in the three sections of literature review، empirical study، and discussion & conclusion.

Literature review:

This section of the study reviews the three main strands in the extant literature that directly address entrepreneurial education and its approaches. The review is organized into three subsections: the quality of entrepreneurial education، the approaches to entrepreneurial education، and the notion of the entrepreneurial university.

Quality of entrepreneurial education.

Jabeen، Faisal، and Katsioloudes (2017) recognize the quality of entrepreneurial education provided by modern university systems as one of the important factors that help young people understand and develop an entrepreneurial interest and attitude. Sine and Lee (2009) discuss that، in addition to the level of socioeconomic development، the role of rigorous entrepreneurial education in the stimulation of innovation and technological breakthroughs can hardly be overstated. Minniti and Lévesque (2010) contend that via meaningful entrepreneurial education، students are better able to locate the opportunities and underscore the talents necessary to learn more about the most recent advances، which helps them comprehend how these developments might be used in future business firms and revenue generating ideas. Sánchez (2009) explains that، though studies directly addressing entrepreneurial education are rather scant، the relationship between the quality of entrepreneurial education and the number of successful entrepreneurs is strongly positive. In this regard، Walter and Block (2016) study the effectiveness of entrepreneurial education at academic institutions around the world. They show that the caliber of student entrepreneurial ideas has improved specifically as a result of educating students on how to think critically and creatively in their examination and evaluation of concepts. Shah and Pahnke (2014) explain that Universities typically balance the needs of the local market (i.e.، educational achievements connected to regional growth) with the goals of their student populations on a national and international level. They further illustrate that this equilibrium is a reasonable place to start when developing measures to assess an institution's processes for transferring its entrepreneurial capital into performance.

Spiteri and Maringe (2014) observe that in most developed nations، the number of entrepreneurship education programs (EEPs) has increased significantly over the course of the past three decades with courses are designed to teach students how to start and manage their businesses while

pointing them on the path of self-employment. The impact of EEPs on entrepreneurial intention has been the subject of numerous studies (see، e.g.، Do Paco et al.، 2015; Kbathgate et al.، 2013; Silva، 2013; Martin، MacNally، and Kay 2012). For instance، Iakovleva et al. (2011) argue that EEPs have a positive impact on entrepreneurial intention. Sánchez (2013) report that EEPs have a positive impact on the perceived attractiveness and viability of a new business as well as on an individual's self-efficacy، proactivity، and capacity for risk. In this light، Bilbokaitė-Skiauterienė & Bilbokaite (2018) formulate a conceptual framework where the quality of study programs is explained in several variables: learning outcomes، learning resources، course content، academic staff، assessment process، and program management. Such framework defines the deductive rationale and theoretic predictions entailed in this current study with respect to the quality of entrepreneurial education.

Approaches to entrepreneurial education.

Cheng et al. (2009) broadly categorize approaches to entrepreneurial education into the passive approach and the active approach. Wingfield and Black (2005) explain that the passive approach defines the traditional approach to entrepreneurial education and emphasizes delivering concepts that are simple to describe verbally and depict visually. They further reiterate that the passive approach's conceptual emphasis is crucial for creating a solid theoretical base for students to build upon in subsequent courses. This is so since such approach typically enables instructors to cover a lot of ground in a short period، convey knowledge، and introduce fundamental ideas via a one-to-many and teacher-centered communication that involves the teacher speaking while the class listens (Wing-field and Black 2005). As opposed to the passive approach، Walter & Dohse (2012) describe the active approach as a student-focused educational intervention where students are assigned tasks that makes them think critically about concepts and the possibilities via which they can have them applied. It is essentially what is referred to as a student-centered approach. This active approach، also known as the

innovative or action-based approach، places a strong emphasis on the use of action learning، experiential learning، or a more action-based approach، where the student is more engaged and drives the learning process (Walter and Dohse 2012). In this context، active learning، defined by Michel et al. (2009)، as a process that involves students "doing things and thinking about what they are doing،" and it includes a variety of techniques like problem-based learning، cooperative learning، experiential learning، and participative learning (Michel et al. 2009، p. 398). Ismail et al. (2018) further underlines that the active approach incorporates a two-way and reciprocal communication between students and their instructors. They also conclude that students tend to learn differently under both approaches. Whereas the passive approach utilizes passive teaching، in which instructors play the primary role of launching the learning process while students are only expected to receive and digest the knowledge that instructors disseminate، students assume the lead part under the active approach، and instructors more closely resemble "coaches" or "facilitators" of the learning. In this concern، Keat and Ahmad (2012) defend that an excellent entrepreneurial education system should be designed so as to increase the likelihood of changing the traditional teaching approach and motivating students to become more active learners as opposed to passive sponges for information. Moreover، Gustafsson-Pesonen & Remes (2012) emphasize that the practice of entrepreneurship education and the effective teaching of entrepreneurship is greatly challenged by the teaching views and positions on the subject.

Under the light of the reviewed approaches to entrepreneurial education above، the results of this current study show that the study variable of the quality of entrepreneurial education is mainly driven by learning outcomes at UC and by learning resources and facilities at KAUST. Such results may suggest that UC's approach is more passive and KAUST's approach is more active.

The notion of entrepreneurial university

Sam and Van der Sijde (2014) characterize an entrepreneurial university in terms of the active discovery and exploitation of possibilities in order to enhance itself (in terms of education and research) and its surroundings (knowledge transfer)، and is capable of managing (controlling) the interdependence and impact of the three university functions. Gur (2017) highlights that an entrepreneurial university is characterized as one that is not only happy with adjusting to its environment، but also actively pursues new tactics and formations that contribute to building a new environment، thereby recruiting the best cadres of students، researchers، and staff. Kirby (2002) documents that entrepreneurial universities typically aspire to advance education، scientific research، and volunteerism through creative management، innovation، and proactive propensity to support the transfer of knowledge to society through the establishment of businesses partnerships with the private sector، public sector، and other stakeholders. Williams (2003) stressed the knowledge transfer attribute to defining entrepreneurial universities and that such transfer is critical for purposes of the socioeconomic growth of communities. Etzkowitz (2003) conceptualizes that the entrepreneurial universities are distinguished by the design of innovative places and services that promote the formation of technology- and knowledge-based businesses. Rizzo (2015) supports that via knowledge transfer، entrepreneurial universities contribute toward the macro entrepreneurial culture by involving all agents in the creation of an entrepreneurial ecosystem، one that is interconnected with its surroundings and where new relationships are generated between university community agents and the institution and businesses. Mele and Russo-Spena (2015) recount that، through their position as mediators، entrepreneurial universities stimulate creativity and knowledge and facilitate the exchange of information across ecosystem members.

In view of the preceding، one may say that both objects to this study (i.e.، UC and KAUST) are greatly considered entrepreneurial universities. On one hand، the University of California offers campus entrepreneurship programs that train students، faculty، researchers، and business executives to construct scalable businesses that will create positive، disruptive change in society. These courses impart knowledge about entrepreneurial leadership، planning، financing، and startup techniques. Each program has a different focus، ranging from interdisciplinary partnerships to technologically advanced and socially conscious businesses. Connecting participants to a particular UC campus's thriving startup ecosystem، its local business community، and the worldwide network is essential (University of California، 2020). On the other hand، King Abdullah University is making great efforts to support entrepreneurship in the Kingdom; It launched the Badir Program for Technology Incubators in 2007 to activate and develop technical business incubators to accelerate and grow emerging technology businesses in the Kingdom (Alshrari et al.، 2021; Esmail، 2018). This is a quantum leap not only to support entrepreneurship but to support technology with the community and governmental participation. In this respect، the university was awarded the "High Impact Incubators" award in 2015 from (UBI Global)، which sponsors the activities of startups in the Kingdom. Several KAUST startups were also included in the list of the top 100 innovative startups، three of which came in the top ten، according to Forbes Middle East magazine in 2015 (KAUST، 2015). Moreover، KAUST has a center dedicated to entrepreneurship، which enhances the university's orientation toward entrepreneurial education، as well as provides the support and resources necessary to launch entrepreneurial initiatives. The center's

management follows a two-pronged approach. Through the center، the university seeks to conduct two strategic goals، the first is to spread knowledge and technical expertise in the field of entrepreneurship and build the culture of entrepreneurship itself، not only in KAUST but also outside the university، and the second is to support the establishment of high-quality start-ups and outstanding impact – to further support this goal، the university launched the business accelerator program "TAQADAM". This six-month acceleration program housed 20 to 30 teams. The most promising teams earned $20،000 to $40،000 in seed money from the Saudi British Bank (SABB) and the KAUST Innovation Fund (Kataya، 2016).

Empirical analysis.

This study estimates for each university a linear model instructed by the theoretical framework of Bilbokaitė-Skiauterienė & Bilbokaite (2018) where the quality of entrepreneurship study programs is explained in several variables: learning outcomes، learning resources، course content، academic staff، assessment process، and program management. The following subsections present the study sample، variables measurement and coding، and data analysis.

Study sample.

The study initially employs a sample size of 97 students for each university. The sample inclusion criterion is that all students filling questionnaires must currently enrolled at entrepreneurship study programs at both UC and KAUST. The sample size is determined based on Cohen's (1988) sample size determination at a 5% type-I error and six explanatory variables. The six explanatory variables consist of learning outcomes، learning resources، course content، academic staff، assessment process، and program management.

Variables' measurement and coding.

All variables are measured in accordance with validated 5-point Likert-type questionnaires. The endogenous variable of the quality of entrepreneurship study programs is measured continuously with a number in the closed interval between one and five. All exogenous variables are measured with an indicator function that assigns '1' for success and 'zero' for failure depending on whether the average response to questionnaire items is above or below the neutral benchmark.

The study variable of the quality of entrepreneurship study program is measured according to the entrepreneurial intent questionnaire developed in (Kenneth، 2014) (see appendix 1). The exogenous variable of entrepreneurial learning outcomes is measured according to the entrepreneurial learning outcomes questionnaire developed in (Kenneth، 2014) (see appendix 2). The exogenous variable of entrepreneurial learning resources is measured according to the school dimension of the entrepreneurship satisfaction of college students advanced in (Jiang et al.، 2019) (see appendix 3). The exogenous variable of course content is measured according to the questionnaire developed in (Wahidmurni et al.، 2019) (see appendix 4). The exogenous variable of academic staff is measured according to the questionnaire developed in (Wahidmurni et al.، 2019) (see appendix 5). The exogenous variable of study process is measured according to the questionnaire developed in (Biggs، 1987) (see appendix 6). The exogenous variable of program management is measured according to the goal directed activity questionnaire developed in (Kenneth، 2014) (see appendix 7).

Statistical Analysis and Results.

This study estimates a linear model for each university to explain the quality of entrepreneurship study programs in several variables: learning outcomes، learning resources، course content، academic staff، assessment process، and program management. The estimation is carried out according to the following functional form:

FF: the quality of entrepreneurship study programs = f (learning outcomes; learning resources; course content; academic staff; assessment process; program management).

The models are estimated while assuming absent specification bias and maintaining Gauss-Markov data generating process where the error term has a constant variance and an average value of zero. The functional form of the model is therefore represented by the following linear specification for each university:

SF: quality (i) = b0 + b1 * learning outcomes(i) + b2 * learning resources(i) + b3 * curriculum design(i) + b4 * academic staff(i) + b5 * assessment process(i) + b6 * program management(i) + e(i).

Where quality is an endogenous variable measured on a continuous basis; (i) is an index for the student included in the dataset and takes discrete values between 1 and 97; b0 is an intercept parameter estimate; b1، b2، b3، b4، b5، and b6 are coefficients or parameter estimates; and resources، course content، academic، assessment، and management are endogenous variables measured on a binary basis; and e is a Gauss-Markov error term with an average value of zero and constant variance everywhere across the study sample.

UC results.

The statistical model output for UC shows that though the six exogenous variables were replicated positively in the quality level of entrepreneurship study programs except for learning resources، only the impacts of learning outcomes and program management were well-pronounced and statistically significant at the 5% level (see table 1). The model has a statistically significant explanatory power of 50.2%.

Table 1: statistical summary output for UC.

Table 1								
SUMMARY OUTPUT UC								
Regression Statistics								
Multiple R	0.70							
R Square	0.50							
Adjusted R Square	0.46							
Standard Error	0.85							
Observations	97							
ANOVA								
	df	SS	MS	F	Significance F			
Regression	6	60.14	10.02	15.12	6.66E-12			
Residual	90	59.63	0.66					
Total	96	119.77						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	1.97	0.22	8.86	6.46E-14	1.53	2.41	1.53	2.41
Learning Outcomes	0.84	0.30	2.73	0.007	0.23	1.45	0.23	1.45
Learning resources	-0.19	0.24	-0.80	0.42	-0.68	0.29	-0.68	0.29
Curriculum design	0.25	0.26	0.98	0.32	-0.26	0.77	-0.26	0.77
Academic staff	0.27	0.25	1.09	0.27	-0.22	0.78	-0.22	0.78
Assessment process	0.21	0.30	0.69	0.48	-0.39	0.82	-0.39	0.82
Program management	0.85	0.29	2.85	0.005	0.25	1.4	0.25	1.44

KAUST results.

The statistical model output for KAUST shows that though the six exogenous variables were replicated positively in the quality level of

entrepreneurship study programs except for academic staff، only the impacts of learning resources and program management were well-pronounced and statistically significant at the 5% level (see table 2). The model has a statistically significant explanatory power of 47%.

Table 2: statistical summary output for KAUST.

Table 2								
SUMMARY OUTPUT KAUST								
Regression Statistics								
Multiple R	0.68							
R Square	0.47							
Adjusted R Square	0.43							
Standard Error	0.76							
Observations	97							
ANOVA								
	df	SS	MS	F	Significance F			
Regression	6	47.14	7.85	13.31	9.58E-11			
Residual	90	53.10	0.59					
Total	96	100.24						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	2.12	0.19	11.14	1.21E-18	1.74	2.50	1.74	2.50
Learning outcomes	0.08	0.33	0.26	0.79	-0.58	0.76	-0.58	0.76
Learning resources	0.71	0.19	3.63	0.000	0.32	1.11	0.32	1.11
Curriculum design	0.40	0.24	1.63	0.10	-0.08	0.89	-0.08	0.89
Academic staff	-0.39	0.32	-1.19	0.23	-1.04	0.25	-1.04	0.25
Assessment process	0.21	0.28	0.74	0.45	-0.35	0.77	-0.35	0.77

Program management	0.93	0.24	3.80	0.00	0.44	1.42	0.44	1.42

The preceding statistical output results for UC and KAUST show that though the explanatory variable of program management is significantly well-pronounced in both universities، the study variable of the quality of entrepreneurial education is mainly driven by learning outcomes at UC and by learning resources and facilities at KAUST (see table 3). Moreover، except for learning resources at UC and academic staff at KAUST، other quality variables of study programs were shown to be replicated in both universities in accordance with theoretic predications. This may suggest that، whereas UC may improve the quality of its entrepreneurial education by augmenting learning resources and facilities، KAUST may benefit from UC's experience in terms of academic staff and the formulation of learning outcomes.

Table 3: comparative statistical output.

		UC			KAUST	
	Parameter estimates	Significance	Theory Matching	Parameter estimates	Significance	Theory Matching
Learning outcomes	0.84	0.00	Yes	0.08	0.79	Yes
Learning resources	-0.19	0.42	No	0.71	0.00	Yes
Curriculum design	0.25	0.32	Yes	0.40	0.10	Yes
Academic staff	0.27	0.27	Yes	-0.39	0.23	No
Assessment process	0.21	0.48	Yes	0.21	0.45	Yes
Program management	0.85	0.00	Yes	0.93	0.00	Yes

Discussion and conclusion:

Entrepreneurship has evolved into a powerful tool for creating new employment prospects as well as increasing economic power in the labor market and the economy as a whole (Meek & Wood، 2016; Kaur، 2015;

Kolakovic، 2006). The purpose of this study is to compare the quality of program design for educational entrepreneurship at KAUST and UC. According to the statistical research results، the quality of entrepreneurial education courses at KAUST is mainly driven by learning facilities and program management.

Indeed، KAUST has a specific center for developing and supporting entrepreneurs where it assists its students as well as all other Saudis with outstanding business ideas (Ahmed، 2021). The institution does not offer any special academic programs to its students، instead focusing on developing courses and other efforts to assist entrepreneurs and students who come up with innovative business concepts. This reiterates the empirical results in this study that competitive learning resources and facilities afforded by KAUST greatly drive the quality of its entrepreneurial study courses (see، e.g.، Akinwale et al.، 2019). Toward this end، KAUST is one of the newest institutions in the KSA. It is an independent research university that seeks to advance the KSA economy by fostering innovation and entrepreneurship. KAUST is founded on the principles of scientific advancement and sustainability، which are consistent with Saudi Vision 2030 (McPhedran، 2013). According to Adenle and Alshuwaikhat (2017)، KAUST's primary objective is sustainable development. With such an institution، a country like Saudi Arabia might achieve its development goals far more efficiently.

On the other hand، UC provides a range of academic programs to support startups and entrepreneurs. Technology licensing، faculty and student entrepreneurial support and training، business plan competitions، incubators or accelerators، and startup access to high-end facilities and equipment are some broad categories into which they can be divided (Heaton

et al.، 2019). The sophistication and experience level of these programs varies greatly. Categorically، UC's programmatic approach to educational entrepreneurship is more sophisticated than KAUST's، and this commensurate well with the empirical findings of this study that the learning outcomes at UC largely contribute to the quality of its entrepreneurial academic programs. Therefore، it is advised that KAUST expand its academic curriculum to include academic programs emphasizing entrepreneurship as a degree، rather than only courses (see، e.g.، Shirzai، 2017). UC system plays a significant and rising role in California's economy، not only by providing cutting-edge technology and expertise through its research programs but also by encouraging and supporting the establishment of new enterprises by staff and students. Startups are significant because the vast majority of them locate in California، typically near the campus of the founding faculty member or the campus from which the original entrepreneur. They also tend to expand in the communities in which they are formed، highlighting the significance of UC's campuses to the long-term job and business growth of the regions in which they are located. Due to this، each campus plays a crucial catalytic role in local economic growth. This function varies depending on the campus's age، size، and proximity to a major urban area. Each campus، however، is playing a distinct and expanding role in transferring technology from the laboratory to the market and in harnessing the entrepreneurial drive of its teachers and students to speed up the process.

In conclusion، one may say that the measurements taken by KAUST and UC to enhance entrepreneurial education are similar to some extent، yet some significant differences are spotted with a significant impact on the outcome of efforts made by both universities.

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