



Is There a Link Between Industry Involvement in Higher Education Learning and Student Job Creation Intention?

Journal:	<i>Industry and Higher Education</i>
Manuscript ID	IHE-20-0158.R2
Manuscript Type:	Article
Keywords:	Industry involvement, higher education learning, job creation intention, curriculum restructuring
Abstract:	<p>This study examines how the constituents of industry involvement in higher education learning (IIHEL), namely; curriculum restructuring, renewed pedagogical approaches and competencies, building linkages between higher education and industry, and career training and mentoring might impact student job creation intention. The study builds on the social cognitive theory (self-efficacy) and the theory of planned behaviour (attitude towards behaviour) to assess the mechanisms through which these relationships exist. The researchers used cross-sectional data from 268 final-year undergraduate students of 12 Nigerian public universities to analyze these relationships. Structural equation modelling analysis (SEM-AMOS) was employed to test the direct relationships, and Hayes PROCESS Macro 3.5 was used to test the specific indirect effects. Findings show that all the constituents of IIHEL were associated positively with student job creation intention. However, only self-efficacy mediated the relationships between curriculum restructuring, renewed pedagogical approaches and competencies and student job creation intention. The findings provide practical implications for higher education teachers, managers, practitioners, policymakers and students by demonstrating the importance of IIHEL in boosting student job creation intention.</p>

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Article type: Article**Is there a link between industry involvement in higher education learning and student job creation intention?****Authors:****Christian Ehiobuche**

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Abstract:

This study examines how the constituents of industry involvement in higher education learning (IIHEL) – namely curriculum restructuring, renewed pedagogical approaches and competencies, building linkages between higher education and industry, and career training and mentoring – might impact student job creation intention. The study builds on social cognitive theory (self-efficacy) and the Theory of Planned Behaviour (attitude towards behaviour) to assess the mechanisms through which these relationships exist. The researchers used cross-sectional data from 268 final-year undergraduate students of 12 Nigerian public universities to analyze these relationships. Structural equation modelling analysis (SEM-AMOS) was employed to test the direct relationships, and Hayes' PROCESS Macro 3.5 was used to test the specific indirect effects. The findings show that all the constituents of IIHEL were associated positively with student job creation intention. However, only self-efficacy mediated the relationships between curriculum restructuring, renewed pedagogical approaches and competencies and student job creation intention. The findings provide practical implications for higher education teachers, managers, practitioners, policymakers and students by demonstrating the importance of IIHEL in boosting student job creation intention.

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3 **Keywords:** Industry involvement in learning, higher education learning, job creation
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5 intention, curriculum restructuring, Theory of Planned Behaviour, social cognitive theory
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11 We live in a highly competitive global society, which requires a rapid evolution of the labour
12 market to deliver the needs of society in terms of products and services (Alonso et al., 2010).
13 To ensure that such demands are met, there must be a supply of competent and skilled graduates
14 to act as either employers or employees. Thus there is a requirement for higher education
15 institutions (HEIs) to produce graduates who have developed work-related or business start-up
16 knowledge, skills and attitudes so that they can work effectively in established firms or start
17 their own business and create jobs for others. This is especially important in light of the
18 increasing number of student enrolments, lack of graduate jobs and rising underemployment
19 (Karmel and Carroll, 2016; Valentin, 2000). In Nigeria, for instance, 40 per cent of the total
20 population, or almost 83 million people, live below the country's poverty line of 137,430 Naira
21 (\$381.75) per year and do not have a job to earn a livelihood (World Bank (2019). This situation
22 has led to the Nigerian government's policy on promoting entrepreneurship or small business
23 start-up as a means of reducing poverty, creating more jobs and helping people to improve their
24 living standard (e.g., Otache, 2019). Furthermore, the drive for HEIs to engage or partner with
25 industry in the effort to produce competent graduates who can start their own businesses and
26 create jobs has attracted many researchers in recent years. Also, various initiatives have
27 emerged in the search for sustainable strategies to improving higher education–industry
28 linkages and so develop more industry-aware graduates (Allen and Williams, 2005; Hurn,
29 2016; Plewa et al., 2015).

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44 Skilbeck and Connell (2004, p. 7) have explained that 'successful learning at school is
45 the foundation of lifelong learning by individuals in the globalized, knowledge society of the
46 future'. This means that, through effective teaching and learning, graduates can acquire
47 relevant knowledge and skills that may increase their job creation intention. Also, students who
48 participate in other career development programmes, such as extra-curricular activities,
49 exposure to problem-based learning and work placements, may develop the knowledge and
50 skills to start a business after graduation that will boost their job creation intentions (Dickinson
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3 and Griffiths, 2017). Given the lack of jobs available and the overwhelming numbers of student
4 enrolment in HEIs (Okolie et al., 2019), a key priority in ensuring positive graduate outcomes
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6 is to boost student job creation intention and the overall quality of students' work, career and
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8 business start-up knowledge and skills (Franco et al., 2019).
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12 Students' intentions to start their own businesses and so to create jobs can be a good
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14 indicator of the quality of graduate outcomes. Academic and policy reports have outlined useful
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16 ways in which HEIs and industry can partner to improve those outcomes (Okunuga and
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18 Ajeyalemi, 2018; Pitan, 2016), yet an important issue remains conspicuously absent: industry
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20 involvement in higher education learning (IIHEL) and its implications for student job creation
21
22 intention. Evidence suggests that graduates are more likely to develop skills and knowledge for
23
24 work or business start-up when industry experts are involved in the design and delivery of
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26 learning in higher education (Okolie et al., 2020b).
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31 IIHEL refers to the extent to which students perceive that employers are part of the
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33 learning they receive and ensure that they are prepared for the world of work (Okolie et al.,
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35 2020a). It has been associated with shared benefits for students (e.g., employability skills
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37 development, commitment to learning and engagement, etc.), higher education (e.g., producing
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39 competent graduates, training teachers in the use of student-centred approaches, accepting
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41 students into internship programmes, encouraging and promoting skill-driven learning instead
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43 of certificate-driven learning, etc.) and industry (e.g., productivity, recruitment of competent
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45 graduates trained in line with the demands of labour market, job creation, networking, etc.)
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47 (Callanan and Benzing, 2004). Despite these benefits, the links between IIHEL and student job
48
49 creation intention have received scant attention in the research literature. Therefore, there is a
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51 paucity of empirical insights into how IIHEL might influence student job creation intention
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53 and the mechanisms mediating such relationships. This is an important empirical and
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55 theoretical gap that the present study intends to explore systematically.
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3 This study draws on that of Okolie et al. (2020a) which identifies factors that contribute
4 to students' knowledge and skill development, and includes recommendations for (i) curriculum
5 restructuring, (ii) renewed pedagogical approaches and competencies (REPAC), (iii) building
6 effective linkages between higher education and industry (BELHI), and (iv) career training and
7 mentoring (CTM) as effective practices for IIHEL. The goal of the present study is to determine
8 how each of these four constituents of the recommended framework for IIHEL might boost
9 student job creation intention and the mechanisms through which IIHEL might influence
10 student job creation intention. Using cross-sectional data from final-year undergraduate
11 students who had undertaken a compulsory industrial work placement, the study applies a
12 robust empirical analysis to a set of complementary hypotheses (Figure 1).
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28 **Insert Figure 1 about here**
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31 The study contributes to the literature in several ways. It provides deeper insights into
32 how IIHEL might engender positive job creation intention among undergraduate students, and
33 so ultimately improve business start-up intention and behaviours – the former being a fairly
34 neglected domain in industry and higher education research. The authors acknowledge
35 previous research showing that IIHEL can provide various benefits (e.g., Okolie et al., 2020a;
36 Dickinson and Griffiths, 2017); yet, the direct implications for student job creation intention
37 are not fully understood. Our study addresses an important research gap, highlighting useful
38 ways to develop students' job creation intention and improve higher education–industry
39 partnerships to improve the quality of graduate outcomes. The study draws on social cognitive
40 theory (SCT) and the Theory of Planned Behaviour (TPB) to address this research gap.
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42 Considering the importance attributed to graduate venture creation and its impact on job
43 creation, it is appropriate to explore how IIHEL can facilitate student job creation intention
44 (e.g., Krueger and Carsrud, 1993; Matricano, 2019; Nabi et al., 2006).
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Literature Review and Theoretical Background

The existing literature on the constructs of IIHEL, the theories, and job creation intention are reviewed in this section to provide information on previous studies and to develop the hypotheses.

Job Creation Intention

Job creation intention has been defined in many ways: as the intention to start a business venture, to own a business, to become self-employed or to employ others (Zhao et al., 2005). Producing graduates who are more entrepreneurial and so able to contribute to solving social problems has become a priority of the Nigerian government, and HEIs have been making efforts to encourage students to start their own businesses after graduation and so to create jobs (e.g., Otache, 2019). Student job creation intention may be improved by IIHEL – a partnership that can motivate students to be entrepreneurial. This study acknowledges that students' intentions to become entrepreneurial and/or to create jobs after graduation may be motivated by many factors, including, for example, parents' ownership of a business or other family and peer influences. However, IIHEL is a major factor that can motivate student job creation intention since it enhances knowledge and skills for job creation (Okolie et al., 2020a).

The intention to become self-employed or create jobs after graduation can be seen as a predictor of entrepreneurial engagement (Kautonen et al., 2015). We acknowledge that entrepreneurship education and other entrepreneurial activities take place in the HEIs of many countries and that, in many cases, participation in entrepreneurship courses is a mandatory requirement for graduation. However, previous studies have questioned the ability of entrepreneurship courses and initiatives promoted by higher education to enhance students' entrepreneurial aspirations and intentions (Otache, 2019). For example, Støren (2014) found that, among Norwegian graduates, those who had studied entrepreneurship-related courses as

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3 part of their curriculum had no greater intentions to start their own business than other
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5 graduates. Barba-Sánchez and Atienza-Sahuquillo (2018) also found no influence of
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7 entrepreneurship education on business start-up intention among Spanish engineering students.
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9 These reports are indications that entrepreneurship education may not be enough in itself to
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11 motivate student job creation intention. Hence the need for IiHEL and higher education
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13 curriculum restructuring.
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19 *Curriculum Restructuring*

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21 The emphasis on student job creation intention “raises awareness that graduates’ ability to
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23 create jobs requires the restructuring of HE curriculum to include programmes and activities
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25 that support the development of entrepreneurial knowledge and skills” (Okolie et al., 2020a, p.
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27 5). Restructuring the curriculum to include such programmes and activities can help to reduce
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29 many theory-based courses offered in the HE, which may limit students’ intentions to start their
30
31 own businesses leading to job creation after graduation. Seasoned industry experts and HE
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33 policymakers whose entrepreneurial ideas and skills are well known can be integrated into the
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35 design and delivery of the course modules or activities. These experts can help by identifying
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37 the needs of society for technological innovation, manpower development and economic
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39 growth. This can encourage more undergraduates to consider the option of a career within the
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41 small business sector or through starting their own businesses (e.g., Holden et al., 2002; Nabi
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43 et al., 2006).
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49 Also, Okolie et al. (2020a, p. 5) identified a demand for “a more vocational/professional
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51 curriculum, which would emphasize the development of specific skills in addition to discipline-
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53 specific knowledge” and that would “support multidisciplinary knowledge and encourage
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55 student-centred and problem-based learning which foster skills for starting businesses” after
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57 graduation. Curriculum restructuring can enable HEIs to offer students greater choice and
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3 control over their learning and hence increase their entrepreneurial or job creation
4 intentions. Karseth (2006) has explained that curriculum restructuring implies an outward
5 orientation, where the student as a potential consumer is placed at the centre. Curriculum
6 restructuring can, furthermore, facilitate renewed pedagogical approaches and competencies
7 (REPAC) and be a means of advocating student-based learning and a learner-centred
8 curriculum which might help students to develop knowledge and skills that will spur their job
9 creation intention (Moore, 2003; Scott and Watson, 1994). Thus we might expect a positive
10 relationship between curriculum restructuring and student job creation intention.
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23 ***Hypothesis 1:*** Curriculum restructuring on the recommendations of industry experts is
24 directly and positively associated with student job creation intention.
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30 *REPAC*

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32 In promoting industry support for entrepreneurship education, setting up innovation hubs,
33 promoting industry–HE partnerships and encouraging student business start-ups, REPAC is
34 very relevant. For example, Okolie et al. (2020a, p. 6) found that “poor teaching approaches
35 used by a majority of teachers in Nigeria might be hindering students’ successful development
36 of entrepreneurial capabilities”. The inability of teachers to use effective pedagogical
37 approaches that can engage students and motivate them to construct meaningful learning may
38 hinder their development of knowledge and skills for job creation after graduation. REPAC
39 concerns innovative pedagogical approaches that allow interactive, experimental,
40 transformative and real-world learning (e.g., Brundiens et al., 2010; Seatter and Ceulemans,
41 2017). Such approaches can facilitate the generic skills development that students need for
42 successful business start-up after graduation. However, it is important to acknowledge that the
43 choice of pedagogical approach depends largely on the educational goals and the specifics of
44 the situation, such as the learning environment (De Freitas and Oliver, 2005).
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3 Furthermore, REPAC requires that teachers in higher education undertake continuing
4 professional development (CPD) to keep their pedagogical competencies up to date. This CPD
5 can enable them to understand students' diverse learning needs and to identify the best
6 approach for stimulating job creation intention. Okolie et al. (2020a, p. 7) argue that
7 introducing and adopting teaching approaches such as “problem-based learning, practice-based
8 learning, work-based learning, collaborative learning, self-directed learning, and competency-
9 based learning in addition to the traditional teaching methods can help students to develop
10 theoretical knowledge and practical skills”. The present study, therefore, argues that, through
11 REPAC, building effective linkages between higher education and industry (BELHI) becomes
12 possible and that students can develop critical thinking skills, become able to recognize
13 opportunities, and build interest in starting and running a business after graduation (e.g.,
14 UNESCO, 2012). Given these potential benefits of REPAC, this study predicts a positive
15 relationship between REPAC and student job creation intention.
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35 ***Hypothesis 2:*** REPAC is directly and positively associated with student job creation
36 intention.
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40 *BELHI*

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42 Previous studies have reported that effective linkages between industry and higher education
43 facilitate industry's input into learning (Callanan and Benzing, 2004). It has also been
44 recognized that an increase in such linkages can promote students' development of economy-
45 based knowledge, competitiveness and the motivation to create new businesses for job creation
46 (e.g., Cassiman and Veugelers, 2007; Thune, 2011). Okolie et al. (2020a, p. 7) found that these
47 linkages could strengthen existing entrepreneurship education through career development
48 learning, work placement programmes, career mentoring, career fairs, innovation hubs and
49 business start-up ideas.
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3 While many studies have reported the difficulty of creating a specific typology to
4 classify higher education–industry linkages (e.g., Chau et al., 2017; Monjon and Waelbroeck,
5 2003), others have found positive higher education–industry linkages (Al-Tabbaa and Ankrah,
6 2016; Faems et al., 2005). Kaklauskas et al. (2018), for example, found that effective linkages
7 improved technological development and increased productivity. Such findings highlight the
8 importance of BELHI in the integration of classroom learning with real-world practical
9 experiments and career training and mentoring (CTM), strengthening students’ ability to
10 operate effectively as professionals or entrepreneurs after graduation. By extension, we argue
11 that BELHI will have positive effects on other graduate outcomes, such as students’ sense of
12 empowerment, information and opportunity seeking, creativity and problem-solving, self-
13 confidence, goal setting, networking and professional contacts, which can boost their job
14 creation intention.

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32 ***Hypothesis 3:*** BELHI is directly and positively associated with student job creation
33 intention.

34 35 36 37 *CTM*

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39 Through IiHEL, CTM can be provided to students in the form of activities and programmes
40 that will help them develop an interest in pursuing career goals or in starting a business. Okolie
41 et al. (2020b, p. 217) define CTM as organized training or activities and practices that involve
42 professionally trained counsellors to provide the high-quality careers advice, coaching and
43 mentoring that are vital for students to make informed career decisions. They further explain
44 that CTM differs from other career education programs in that, while other programmes are
45 publicly offered to many students, CTM applies to both public and one-on-one support. In line
46 with this definition, we refer to CTM as carefully planned career training with one-on-one
47 coaching support that should be provided free to students to enhance their lifelong learning and
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3 business creation intentions. This important academic activity can help reduce graduate–job
4 mismatch in that students will have an opportunity to interact face-to-face with industry and
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6 business development experts.
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10 To promote effective CTM, Okolie et al. (2020b) recommended that HEIs should
11 establish dedicated CTM centres, managed by professionally trained career experts or teachers
12 in the field of career development. With such support, students will have easy access to
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14 business and job-related information, and will be able to obtain informative responses to
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16 business start-up questions that will stimulate their job creation intentions. We argue that CTM
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18 activities and programmes such as job fairs, placement training, career and business talks,
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20 seminars, business start-up workshops, supervised internships and entrepreneurship education
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22 may boost interest in business creation. Furthermore, while explaining the procedures for
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24 establishing a CTM centre in an HEI is beyond the scope of this paper, we argue that CTMs
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26 can enhance the provision of up-to-date business start-up information, ease the school-to-work
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28 transition, facilitate choice-making, and improve training and mentoring on graduate venture
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30 creation.
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40 **Hypothesis 4:** CTM is directly and positively associated with student job creation
41 intention.
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44 This study draws on two major theories relating to psychology and management – the
45 Theory of Planned Behaviour (TPB) and social cognitive theory (SCT) – to explain the
46 relationship between IIHEL and job creation intention. In this study, key elements (one from
47 each) of these theories form the mediating variables through which IIHEL may influence
48 students' job creation intention. First, the TPB has been effectively used to explain a range of
49 topics in intention and behavioural research (e.g., Lindstrom-Forneri et al., 2007; Van der
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51 Linden, 2011). Student job creation intention is a planned response rather than a spontaneous
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3 decision (Krueger et al., 2000; Lingappa et al., 2020). As Ajzen (1991) explained in the TPB
4 model, attitude toward behaviour, subjective norms and perceived behavioural control are the
5 three factors that explain an individual's intention to engage in certain behaviour. However,
6 our focus here is only on the attitude toward behaviour (students' attitude toward job creation).
7 Since job creation intention is believed to be an entrepreneurial behaviour, the TPB is useful
8 in explaining the processes leading to student job creation behaviour through the 'attitude
9 toward behaviour' constituent of the model. However, in this paper we refer to the attitude
10 toward behaviour as the 'mindset' of the student toward job creation behaviour.

21 Second, SCT (Bandura, 1977) refers to self-efficacy belief as "a mechanism of
22 operation" that involves an individual's conviction that they will successfully implement
23 actions leading to a desired outcome. Self-efficacy has been identified as a successful mediator
24 in career or business development outcomes – specifically, interest development, decision-
25 making and performance attainment (Lent and Brown, 2013). According to Luszczynska et al.
26 (2005, p. 439), self-efficacy is "the belief in one's competence to cope with a broad range of
27 stressful or challenging demands". It has the ability to influence intention, self-regulation and
28 outcome expectations (Luszczynska et al., 2005). As Zhao et al., (2005, p. 1267) explain, "self-
29 efficacy represents a central mechanism of personal agency. It is thought to influence not only
30 one's level of effort and persistence on a specific task but one's very choice of activities and
31 behavioural settings". Studies have reported that self-efficacy is positively related to business
32 venture creation intention (e.g., Zhao et al., 2005; Wang et al., 2016). Thus the present study
33 considers self-efficacy in the relationship between IIHEL and student job creation intention.
34 We argue that self-efficacy and attitude toward behaviour mediate that relationship:

54 **Hypothesis 5:** Attitude toward behaviour mediates the relationship between IIHEL
55 constituents and student job creation intention.
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3 **Hypothesis 6:** Self-efficacy mediates the relationship between IHHEL constituents
4 and student job creation intention.
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8 **Method**

9 *Sample and Procedure*

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11 This is a cross-sectional study for which data were collected from final-year undergraduate
12 students of Nigerian public universities during April to August 2020. The undergraduates had
13 undertaken a three- to six-month compulsory industrial work placement and completed all
14 mandatory entrepreneurship education courses. They could therefore offer relevant information
15 concerning the practical application of SCT and the TPB through education and training for
16 national productivity and job creation. We adopted an online data collection procedure,
17 designing the questionnaire using Google Forms. The questionnaire was accompanied by a
18 consent note explaining that participation was voluntary, and that the data and responses would
19 be confidential and used for research purposes only (Onwuegbuzie and Collins, 2007). As a
20 follow-up study to the previously published qualitative study (Okolie et al., 2020a), the email
21 and WhatsApp contacts of the 17 final-year undergraduate students who participated in that
22 study were used.
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40 The link to the online questionnaire was shared with participants' contacts and they
41 were encouraged to respond to the questionnaire and share the link with colleagues in other
42 Nigerian public universities who were in their final-year undergraduate programme and had
43 completed the compulsory industrial work placement programme. Through this approach, 289
44 responses were received in the four months of data collection. After removing 21 incomplete
45 responses, the remaining 268 responses were used for the final dataset. These 268 respondents
46 were final-year undergraduate students from the following faculties in 12 Nigerian public
47 universities: Education (56 respondents, 20.89%), Agriculture (43, 16.04%), Engineering (51,
48 19.03%), Natural and Applied Sciences (33, 12.31%), Management Sciences (44, 16.43%) and
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3 Biological Sciences (41, 15.30%). Respondents were aged between 21 and 28, and 172
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5 (64.18%) were male and 96 female.

6 7 *Measures*

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10 *Student job creation intention.* Intention was measured through responses to six adapted
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12 statements relating to students' intentions to become entrepreneurs (Liñan and Chen, 2009) –
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14 for example, "I am determined to create my own business after graduation to create jobs".
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16 Responses ranged from 1 (strongly disagree) to 5 (strongly agree). The scale has a Cronbach's
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18 α of 0.9; however, our α was 0.85.

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24 *Attitude towards behaviour.* This was measured through an adapted 5-item scale relating to the
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26 students' attitude towards business start-up leading to job creation (Liñan and Chen, 2009) –
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28 for example, "A career as an entrepreneur is attractive to me". Responses ranged from 1
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30 (strongly disagree) to 5 (strongly agree). The scale reported a Cronbach's α of 0.89, and ours
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32 was also 0.89.

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38 *Self-efficacy.* We adapted the 9-item entrepreneurial self-efficacy sub-scale (Wang et al., 2019)
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40 – for example, "I possess the ability to be an entrepreneur". Responses ranged from 1 (strongly
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42 disagree) to 5 (strongly agree). The scale developer reported a Cronbach's α of 0.84, while our
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44 α was 0.96.

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50 *Curriculum restructuring.* We adapted the fundamental change scale of school restructuring
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52 and student achievement in Washington state of Fouts et al. (1999), altering the wording of
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54 some items to suit the context of the study – for example, "I will be better prepared as a result
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56 of the changes the curriculum restructuring will bring". Responses ranged from 1 (strongly
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3 disagree) to 7 (strongly agree). The original scale reported an α value of 0.87 while our α was
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5 0.95.

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8 *REPAC*. Given the lack of a validated scale, we self-developed a 10-item scale to measure
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10 students' perceptions of renewed pedagogical approaches and the competencies of teachers,
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12 first conducting a pilot study following recommended scale development procedure
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14 (Carpenter, 2018). Statements included, for example: "I will be better prepared as a result of
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16 renewed pedagogical approaches and competencies of my teachers". Responses ranged from
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18 1 (strongly disagree) to 7 (strongly agree). The Cronbach's α was 0.81.
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24 *BELHI*. We self-developed a 7-item scale to measure students' perceptions of building
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26 effective Higher education–industry linkages. As for the REPAC scale, we conducted a pilot
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28 study following recommended scale development procedure (Carpenter, 2018). Statements
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30 included, for example: "My entrepreneurial intentions will improve as a result of effective
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32 linkages between my university and industry". Responses ranged from 1 (strongly disagree)
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34 to 7 (strongly agree). The Cronbach's α was 0.77.
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40 *CTM*. We adapted the 6-item career dimension and mentoring effectiveness subscale of
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42 Dilmore et al. (2010). Statements included, for example: "I will learn more strategies for
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44 achieving career aspirations". The responses ranged from 1 (strongly disagree) to 7 (strongly
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46 agree). The original scale reported a Cronbach's α value of 0.95; our α was 0.88.
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51 *Control variables*. We controlled for age and gender of the undergraduates to ascertain whether
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53 they might influence job creation intentions. Also, Curran et al. (1991) found that people whose
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55 parents were owners of small firms might want to follow in their parents' footsteps and become
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57 business owners. Therefore, we controlled for parental self-employment.
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Analytical procedure

We conducted a confirmatory factor analysis (CFA) using Amos 24.0 to test the measurement model fit indices. The latent variables representing curriculum restructuring, REPAC, BELHI, CTM, self-efficacy, attitude towards behaviour and student job creation intention made up the measurement model. The overall goodness-of-fit was considered adequate: $\chi^2 = 423.01$; $df = 149$; $\chi^2/df = 2.84$; CFI = 0.94, TLI = 0.92, SRMR = 0.05, IFI = 0.93, and RMSEA = 0.06, indicating an acceptable model fit (Hu and Bentler, 1999). Focusing on the contents of the items for measuring the variables, we gradually removed items that loaded below 0.50 during principal axis factorial analysis in SPSS, as well as items that had standardized regression weights smaller than 0.70 during the CFA in AMOS (Hair et al., 2010).

Model validity and reliability measures

The indicator factor loadings are significant and exceed the acceptable value of ≥ 0.6 on their corresponding constructs. Convergent validity was established, as the average variance extracted (AVE) is ≥ 0.50 . Discriminant validity was established, as the square root of AVE is greater than the correlation of the latent variables in the CFA (Fornell and Larcker, 1981). Also, in line with Hair et al. (2010), Cronbach's alpha and composite reliability values are ≥ 0.70 and ≥ 0.60 , respectively, while the factor loadings are ≥ 0.50 (see Table 1).

Table 1 about here

Results

As shown in Table 2, the bivariate analysis indicated that all the constituents of IIHEL – curriculum restructuring ($r = 0.17, p < 0.01$), REPAC ($r = 0.40, p < 0.01$), BELHI ($r = 0.17, p < 0.01$) and CTM ($r = 0.18, p < 0.01$) – were positively correlated with student job creation

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3 intention. Also, attitude towards behaviour ($r = 0.13, p < 0.05$) and self-efficacy ($r = 0.16, p$
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5 < 0.05) were positively correlated with student job creation intention.
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10 **Table 2 about here**

11 To ascertain whether curriculum restructuring, REPAC, BELHI and CTM would
12 significantly predict student job creation intention, self-efficacy and attitude towards
13 behaviour, we tested direct relationships using structural equation modelling (AMOS 24.0) and
14 by applying bias-corrected 2,000 resample bootstraps to determine all direct effects (at a 95%
15 confidence interval) simultaneously. Table 3 shows the parameter estimates for all direct
16 effects in the model. The model fit measures for the SEM analysis (final model) indicated an
17 acceptable fit (Hu and Bentler, 1999): $\chi^2 = 36.99$; $df = 17.00$; $\chi^2/df = 2.18$; CFI = 0.93, GFI =
18 0.97, IFI = 0.94; SRMR = 0.05, RMSEA = 0.06, PClose = 0.16.
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21 In this model (Table 3), all five constituents of IIHEL were associated positively with
22 student job creation intention: curriculum restructuring ($\beta = 0.13, p < 0.001$), REPAC ($\beta =$
23 $0.27, p < 0.001$), BELHI ($\beta = 0.17, p < 0.001$), and CTM ($\beta = 0.13, p < 0.001$). This provides
24 full support for hypotheses 1, 2, 3 and 4. Also, curriculum restructuring ($\beta = -0.02, p = 0.75$),
25 BELHI ($\beta = -0.01, p = 0.92$) and CTM ($\beta = 0.11, p = 0.10$) were not significantly associated with
26 attitude towards behaviour. Only REPAC ($\beta = 0.34, p < 0.001$) was associated positively with
27 attitude towards behaviour. The analysis shows that only curriculum restructuring ($\beta = 0.12, p <$
28 0.05) and REPAC ($\beta = 0.16, p < 0.001$) were significantly and positively associated with self-
29 efficacy. However, BELHI ($\beta = -0.08, p = 0.22$) and CTM ($\beta = 0.07, p = 0.30$) were not
30 significantly associated with self-efficacy.
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33 The effects of the mediators on student job creation intention were all significantly
34 positive: attitude towards behaviour ($\beta = 0.15, p < 0.001$) and self-efficacy ($\beta = 0.34, p <$
35 0.001). Also, 5.30% of the variance in self-efficacy, 13.50% in attitude towards behaviour and
36 45.60% in student job creation intention was accounted for in this study (Table 3).
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3 For covariates, the results show that age ($\beta = -0.17, p < 0.05$) was associated negatively
4 with student job creation intention. A possible interpretation of this result is that the lower the
5 age of the student, the lower their job creation intentions. Also, parents' ownership of business
6 ($\beta = 0.26, p < 0.001$) was associated positively with student job creation intention, indicating
7 that students whose parents own a business may be more likely to have intentions to start a
8 business after graduation. This finding corroborates previous findings that students whose
9 families have business enterprises are generally inclined towards entrepreneurial intentions
10 (e.g., Curran et al., 1991; Harris and Gibson, 2008). However, there is no statistically significant
11 evidence that gender ($\beta = 0.03, p < 0.21$) is associated with student job creation intention (see
12 Table 3).
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26 For mediation, the predictors should be related to the mediators and the outcome; the
27 mediators should be related to the outcome, and the relationships between the predictors and
28 outcome should be reduced when the mediators are included (Baron and Kenny, 1986). The
29 regression analysis showed that curriculum restructuring and REPAC were associated
30 positively with the mediators self-efficacy and attitude towards behaviour (Table 3). Therefore,
31 following Shrout and Bolger (2002), mediation can take place only through these paths. To test
32 for specific indirect effects, we followed the procedure outlined by Hayes (2018, p. 144) – the
33 “kX variables PROCESS commands” – to find the specific indirect effects.
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44 **Table 3 about here**
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48 We, used Hayes PROCESS Macro 3.5, applied Model 4 and 5,000 resample bootstrap
49 method to determine the indirect effects. Table 3 (indirect effects) shows that self-efficacy (β
50 = 0.05, $CI_s = [0.01, 0.10], p < 0.001$) mediated the relationship between curriculum
51 restructuring and student job creation intention. Similarly, the analysis shows that self-efficacy
52 ($\beta = 0.04, CI_s = [0.01, 0.09], p < 0.001$) mediated the relationship between REPAC and student
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3 job creation intention. However, there is no evidence of mediation in the relationship between
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5 BELHI, CTM and student job creation intention via self-efficacy or attitude towards behaviour.
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10 **Discussion**

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12 Relying on SCT and the TPB, we assessed a model of undergraduate student job creation
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14 intention. Ascertaining how the constituents of IIHEL – curriculum restructuring, REPAC,
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16 BELHI and CTM (Okolie et al., 2020a) – can foster final-year undergraduate student job
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18 creation intention contributes significantly to our understanding of the intention to start new
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20 businesses leading to job creation in this population. As far as we know, no previous studies
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22 have drawn on SCT and the TPB to test the relationships among curriculum restructuring,
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24 REPAC, BELHI, CTM, self-efficacy, attitude towards behaviour and student job creation
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26 intention in a single comprehensive model. Our model proposed that the constituents of IIHEL
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28 were related to students' job creation intention, and we found full support for the hypothesized
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30 model. Also, our model proposed that self-efficacy and attitude towards behaviour mediated
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32 these relationships, and we found that self-efficacy mediated the relationships between
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34 curriculum restructuring and student job creation intention. We also found that self-efficacy
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36 mediated the relationship between REPAC and student job creation intention. We now discuss
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38 the most important contributions of the study.
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45 First, curriculum restructuring was associated positively with student job creation
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47 intention. A possible interpretation of this finding is that, through effective curriculum
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49 restructuring via a joint effort by teachers, industry executives and policymakers to include
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51 business start-up activities or programmes, students may be more likely to develop the intention
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53 to create a business after graduation, leading to job creation. This result corroborates previous
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55 findings that linked curriculum restructuring to student business start-up or job creation
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57 intentions (e.g., Krueger et al., 2000; Nabi et al., 2006; Tessema, 2012). According to Okolie
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3 et al. (2020a, p. 7), “the curriculum is the main focal point in developing entrepreneurial and
4 job creation skills and universities cannot achieve that outcome by themselves, so the
5 engagement of industry in refocusing the curriculum and programme design is imperative”.
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10 Also, the study revealed that curriculum restructuring was positively associated with
11 self-efficacy and attitude towards business. This indicates that restructuring the curriculum to
12 include more practical entrepreneurial activities will play a significant role in activating
13 students’ job creation self-efficacy and attitudes toward future job creation. This result supports
14 the view that restructuring the curriculum to include business start-up and development
15 activities can boost students’ perception of their self-efficacy and their confidence to execute
16 behaviours necessary to start a business (this is consistent with previous findings – see Nabi,
17 2006; Peterman, 2003).
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28 Second, REPAC was positively associated with student job creation intention. This
29 indicates that renewing the pedagogical approaches used by the teachers as well as their
30 competencies will play a significant role in boosting students’ interest in starting a business
31 after graduation. A possible interpretation of this finding is that, through REPAC, teachers can
32 be empowered to use various innovative teaching approaches to activate a set of business start-
33 up behaviours in students to improve their intentions to become future employers of labour.
34 This result supports the view that innovative pedagogical approaches, such as, among others,
35 work-based learning, problem-based learning and student-centred learning, can improve the
36 successful development of entrepreneurial capabilities and increase job creation intention. This
37 corroborates the previous finding that REPAC can encourage higher education teachers to “be
38 proactive in planning and delivering their teaching. For example, in addressing real-life
39 challenges in companies, students can find solutions through problem-based learning, thus
40 developing business acumen” (Okolie et al., 2020a, p. 7). Also, REPAC was associated
41 positively with self-efficacy and attitude towards behaviour. By implication, improving
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3 teachers' competencies and using an appropriate teaching approach can improve students' self-
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5 efficacy or belief in their ability to start-up businesses after graduation. This can also improve
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7 students' attitude towards behaviours relating to becoming a future entrepreneur.
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10 Third, the results showed that BELHI was positively associated with students' job
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12 creation intention. This indicates that effective higher education–industry linkages are likely to
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14 improve the integration of classroom learning with real-world practical experiments, which can
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16 strengthen students' ability to operate effectively as entrepreneurs after graduation. Callanan
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18 and Benzing (2004) suggest that, through effective linkages, new and existing industries in and
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20 outside an HEI's host community can be involved in improving student learning by voluntary
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22 training of students in job creation skills. Franco et al. (2019) find that professional learning
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24 programmes or activities provided by industry–higher education linkages play a crucial role in
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26 students' entry into a labour market characterized by strong competition. As Lam and Ching
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28 (2007) argue, effective linkages can help students to bridge the gap between the academic
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30 learning process and practical realities. Surprisingly, we found no evidence that BELHI was
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32 positively associated with self-efficacy and attitude towards behaviour in this population.
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37 Fourth, our study revealed that CTM was positively associated with student job creation
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39 intention. This result indicates that students who received adequate career training and
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41 mentoring in business start-up may be more likely to have job creation intentions. The result
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43 also supports the view that adequate career-related advice and mentoring can increase students'
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45 business start-up orientation, which can boost job creation intention (Otache, 2019). A possible
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47 interpretation of this finding is that students can be encouraged and mentored to share their
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49 career development problems with industry experts employed by their HEI. Such career-related
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51 interaction can provide students with up-to-date business start-up information that may boost
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53 their intention to become future employers of labour. However, there was no evidence that
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55 CTM influenced student self-efficacy and attitude towards behaviour in this population.
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Lastly, regarding the specific mediating effects of self-efficacy and attitude towards behaviour, our results show that only self-efficacy was supported. This implies that the relationship between curriculum restructuring and student job creation intention was mediated through self-efficacy. Also, self-efficacy mediated the relationship between REPAC and student job creation intention. These outcomes suggest that restructuring the curriculum and REPAC may not wholly explain increased job creation intention; rather, we need to take into account entrepreneurial activities included in the restructured curriculum, innovative teaching approaches and self-efficacy belief with regard to business start-up after graduation. However, this study found no evidence of mediating effects of self-efficacy and attitude towards behaviour in the relationships between BELHI, CTM and student job creation intention.

Conclusion and implications

This study shows that the constituents of IIHEL (curriculum restructuring, REPAC, BELHI and CTM) are significant positive predictors of student job creation intention. It reveals that the association between curriculum restructuring and REPAC and job creation intention may be due to the impact that curriculum restructuring has on the students' belief in their self-efficacy, which is associated with increased job creation intention. The findings thus advance our understanding of the role that IIHEL can play in student job creation intention and the study contributes to the literature on higher education–industry partnerships by not merely establishing a link between the previously recommended constituents of IIHEL (Okolie et al., 2020a) and student job creation intention, but by showing how self-efficacy mediates these relationships. The study has practical implications for teachers, students, practitioners and policymakers who are searching for innovative strategies to improve industry–higher education partnerships and students' job creation intention. Industry executives can help students to explore real-world practical experiments on business start-ups and provide them with the appropriate knowledge and skills to start and manage an enterprise after graduation.

Limitations and future research

A major limitation of the study is the use of a cross-sectional design, which made causal inferences very difficult. However, this research does provide a better understanding of the mechanisms via which the constituents of IIHEL are associated with student job creation intention. Furthermore, the use of a self-reporting measure to evaluate variables may result in self-report bias or common method variance. We recommend that future research should use other measures, although we made efforts to reduce the risks of self-reporting bias by using different scales and response formats for the constituents of IIHEL and student job creation intention (Podsakoff et al., 2003). Another limitation relates to the small sample size, which limits the generalizability of the findings beyond the context of the current study. However, we applied the 5000 resample bootstrapping method which allows for generalization of the results to decrease this limitation (Hayes, 2018). We recommend that future studies use a larger sample and longitudinal data to provide further information about the IIHEL interventions needed to confirm the causal direction of these associations.

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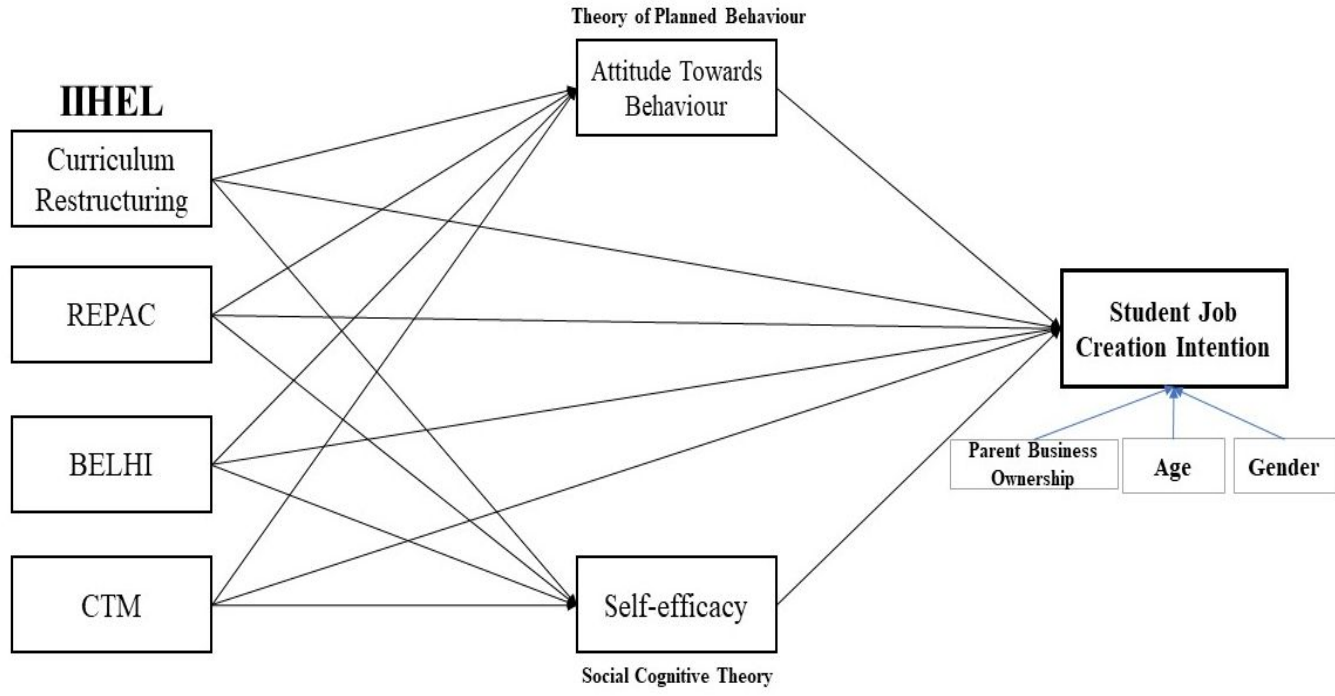


Figure 1. The hypotheses model.

Source: Authors' computation.

Review

Table 1. Measurement scale (model validity measures).

Variables with observed items	Indicators (Items)	Loadings	CR	Cronbach Alpha (α)	AVE	DV	MSV
<i>Curriculum restructuring</i>							
I will be better prepared as a result of the changes the curriculum restructuring would bring	CR5	0.92					
My sense of learning will go beyond the classroom if the curriculum is restructured to include business start-up activities	CR6	0.96					
I will be caused to examine my own views of what constitutes a good entrepreneur capable of creating jobs	CR4	0.94	0.94	0.95	0.86	0.93	0.05
<i>Renewed pedagogical approaches and competencies (REPAC)</i>							
I will be better prepared as a result of renewed pedagogical approaches and competencies of my teachers	REPAC4	0.76					
I will benefit from knowledge exchange, aimed at promoting product/process innovation or new pedagogy	REPAC5	0.79					
My entrepreneurial knowledge and skills will improve through improved teaching approaches	REPAC8	0.83	0.81	0.81	0.56	0.77	0.09
<i>Building linkages between higher education and industry (BELHI)</i>							
My entrepreneurial intentions will improve as a result of effective linkages between my university and industry	BELHI3	0.70					
I will apply the knowledge acquired throughout job creation seminars, workshops and conferences organized by industry in collaboration with my institutions	BELHI7	0.67					
I can be linked to industry experts for business development mentoring, and become familiarized with new technologies for business start-up and development	BELHI8	0.76	0.76	0.77	0.58	0.76	0.13
<i>Career training and mentoring (CTM)</i>							
I will learn more strategies for achieving my career aspirations	CTM1	0.77					
I will gain more advice and guidance on how to attain business recognition	CTM5	0.90					
I will gain the right information about various aspects of my career in business venturing	CTM8	0.89	0.89	0.88	0.73	0.85	0.19
<i>Attitude towards behaviour (ATB)</i>							

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A career as an entrepreneur is attractive to me	ATB4	0.76						
Being a business owner who can create jobs would give me great satisfaction	ATB7	0.74	0.87	0.89	0.81	0.89	0.18	
<i>Self-efficacy</i>								
I possess the ability to be an entrepreneur	Selfe5	0.92						
I have the ability to make decisions after deliberation	Selfe6	0.91						
I can find business partners who complement my ability	Selfe8	0.98	0.95	0.96	0.89	0.94	0.05	
<i>Student job creation intention</i>								
I am determined to create my own business after graduation to create jobs	JCI2	0.84						
I have got the intention to start my own business after graduation	JCI3	0.73						
My professional goal is to own a business after graduation so that I can create jobs	JCI4	0.82	0.85	0.85	0.66	0.81	0.13	

Note: N = 268; CR = Composite Reliability, AVE = Average Variance Extracted, DV = Discriminant Validity, MSV = Maximum Shared Variance. Using the thresholds from Hu and Bentler (1999), our scale has no validity and reliability concerns.

Source: Authors' compilation.

Table 2. Mean, standard deviation, and bivariate correlations among variables.

	Mean	SD	1	2	3	4	5	6	7	8
1 Gender	1.48	0.5	1							
2 Age	1.46	0.5	0.36**	1						
3 Curriculum Restructuring	10.48	4.24	0.07	0.16**	1					
4 REPAC	8.54	4.571	0.07	-0.12	-0.02	1				
5 BELHI	13.36	2.573	0.04	-0.05	-0.02	0.04	1			
6 CTM	12.88	3.295	0.11	0.12	0.04	0.08	0.02	1		
7 ATB	11.07	4.363	-0.01	-0.07	-0.02	0.35**	0.01	0.13*	1	
8 Self-Efficacy	7.88	2.654	0.23**	0.07	0.13*	0.16**	-0.07	0.08	0.16*	1
9 Student Job creation Intention	11.11	4.11	0.13*	-0.17**	0.17**	0.40**	0.17**	0.18**	0.26**	0.43**

Source: Authors' computation. N = 268; * $p < 0.05$; ** $p < 0.01$ (2-tailed).

Table 3. Results showing all direct effects and indirect effects.

Paths		Path estimates	Errors	95% Intervals	Confidence	
				Lower limit	Upper limit	
<i>Direct Relationships</i>						
Curriculum restructuring	→	SJCI	0.13***	0.05	0.04	0.22
REPAC	→	SJCI	0.27***	0.05	0.17	0.37
BELHI	→	SJCI	0.17***	0.05	0.07	0.26
CTM	→	SJCI	0.13***	0.05	0.03	0.22
Curriculum restructuring	→	ATB	-0.02	0.05	-0.13	0.09
REPAC	→	ATB	0.34***	0.06	0.23	0.45
BELHI	→	ATB	-0.01	0.06	-0.13	0.12
CTM	→	ATB	0.11	0.05	-0.02	0.23
Curriculum restructuring	→	Self-efficacy	0.12*	0.06	0.01	0.24
REPAC	→	Self-efficacy	0.16***	0.05	0.04	0.28
BELHI	→	Self-efficacy	-0.08	0.06	-0.19	0.05
CTM	→	Self-efficacy	0.07	0.06	-0.06	0.19
<i>Mediators</i>						
ATB	→	SJCI	0.15***	0.05	0.05	0.26
Self-efficacy	→	SJCI	0.34***	0.05	0.24	0.45
<i>Covariates</i>						
Age	→	SJCI	-0.17*	0.05	-0.25	-0.06
Gender	→	SJCI	0.03	0.05	-0.04	0.18
Parent business ownership	→	SJCI	0.26***	0.06	0.17	0.35
<i>Indirect effects</i>						
Curriculum restructuring	→ Self-efficacy →	SJCI	0.05***	0.02	0.01	0.10
Curriculum restructuring	→ ATB →	SJCI	0.03	0.02	-0.00	0.07
REPAC	→ Self-efficacy →	SJCI	0.04***	0.02	0.01	0.09
REPAC	→ ATB →	SJCI	-0.01	0.01	-0.03	0.02
BELHI	→ Self-efficacy →	SJCI	-0.04	0.04	-0.13	0.03
BELHI	→ ATB →	SJCI	0.00	0.02	-0.04	0.05
CTM	→ Self-efficacy →	SJCI	0.04	0.01	-0.02	0.10
CTM	→ ATB →	SJCI	0.03	0.03	-0.00	0.07

Note: Sample size = 268; Significance levels: *** $p < 0.001$; * $p < 0.05$; SJCI = Student Job Creation Intention; ATB = Attitude Towards Behaviour. All individual standardized regression weights are reported.

Source: Authors' computation.