

# Development of a Scale for Measuring University Students' Attitudes toward Entrepreneurship in Oman

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## Abstract

*This study aimed to develop a scale to measure university students' attitudes towards entrepreneurship in Oman. This questionnaire was developed based on the number of literature, which presented scales and models to measure people's attitudes towards entrepreneurship. The student attitudes were measured by their tendency toward entrepreneurship which was based on four domains: personal skills, technical skills, managerial skills, and leadership skills. Data was collected from 592 students. The instrument underwent a psychometrics process to obtain reliability and validity. PLS-SEM was used, the Assessment of a Measurement Model (AMM), rho\_A, Composite Reliability, and Average Variance Extracted (AVE) were checked for the item and construct reliability with Discriminant validity for construct validity. Findings of the entrepreneurial skills among university students showed that all standardized factor loadings of the skills on the latent entrepreneurship factor were relatively higher than 0.70. The study concluded that the items were reliable and constructs were valid enough to use to measure student attitudes toward entrepreneurship in Oman.*

**Keywords** — Entrepreneurship, Scale, Students' Attitudes, PLS-SEM, Item reliability, Construct Validity, Oman

## I. INTRODUCTION

One of the challenges facing society recently is to foster entrepreneurship and for it to become an essential policy for education and economic institutions and to have a number of desirable social outcomes. If university programs are designed to help students become entrepreneurs who can organize, manage and assume the risks of business or enterprises, it will bridge the gap between schools and work marketplace. Awe [1] identified the characteristics of entrepreneurial skills to include a compelling vision, a driving passion, versatility or flexibility in planning, confident execution, and curiosity. The vital characteristics of real entrepreneurs as managers are to “adopt key

behaviors developed by understanding key market concepts and theories, besides their planning, and to have research skills”[1, p7].

The literature shows a lack of a single accepted definition of the term entrepreneur. Gartner[2] proposed that each researcher should clearly state what is meant by the term. Therefore, in this study, an entrepreneur is defined as an “individual who has a high propensity for success with self-confidence, having the ability at dealing with risk and using technology in proficiency, discovering business opportunities, actively involved in strategic planning and daily operational businesses.”Kayed & Hassan[3, p1] definition indicates that entrepreneurship creates jobs, inspires creativity, promotes competitiveness, and contributes in many ways to the well-being of an individual.

However, entrepreneurship is not for everyone. Some people lack the qualities needed to become successful entrepreneurs. Others lack the aptitude needed to run a business. Whilst discussing this issue, Greene[4, p12] identified several characteristics of successful entrepreneurs which were: self-independence, self-confidence, determination, perseverance, having a need to achieve and set high standards for themselves, create, able to act quickly, and keep up to date with technology. Developing a clear vision which translated into developing a meaningful mission was considered the first step that expresses what an entrepreneur stood for and believes in. Scarborough[5, p92] stated, “Highly successful entrepreneurs are able to communicate their vision and their enthusiasm about that vision to those around them”. A vision is the result of an entrepreneur's dream of something that does not exist yet and the ability to paint a compelling picture of that dream or everyone to see.

In an Omani context, the situation does not differ from international economic trends. Oman, as one of the Gulf States, has explicitly emphasized the importance of entrepreneurship and encouraged people to actively participate in the business[6]. The concept of a collective obligation (Fardh Kifayah) in Islam (the Country's religion) is based on the ability

of society to meet its minimum and basic needs from a specified activity to overcome national challenges and obligations. The strategic plan of 2020 started to increase the rate of new business formations among people. The Omani government established two offices to support small ventures economically and financially named (SANAD and RAFD), to sustain the economic development of small and medium businesses. SANAD (which literally means 'Support') is a government initiative under the supervision of the Ministry of Manpower which aims to train young unemployed nationals to start and run a micro-business. SANAD also helps these individuals obtain soft microloans from the Development Bank of Oman [7].

Al-Shanfari [7] illustrated a number of prevailing entrepreneurial environment challenges in Oman which were as follows:

1. Regulatory and administrative issues where administrative and licensing procedures involved many restrictions, complexity, and bureaucracy.
2. Macroeconomic and market conditions with Oman having a small local market, low market purchasing power, competitive imported products, and weak connections to export markets, which restricts new business start-ups[8].
3. Labor regulation and market, as there is a poor supply of qualified national workers. In addition, a poor work ethic in the national labor force.
4. Society's culture and social norms as entrepreneurship are still more of a past than a present phenomenon in Oman. There is scarcity in successful and self-made entrepreneurial role models in the Omani society. Moreover, they have not received much media attention.
5. There is a limited number of entrepreneurship support programs. In terms of science parks, in 2003, the Ministry of Commerce & Industry initiated the first and only IT Park, called the 'Knowledge Oasis Muscat' (KOM). The park currently hosts around 60 local and international established businesses such as Microsoft. KOM has the only business incubator program called 'The Knowledge Mine'. The program offers subsidized office space and other support services for nascent entrepreneurs in technology-dependent businesses. However, the capacity of this program is limited to 15 new firms and, currently, all spaces are occupied.

Additionally, Al-Shanfari [7] again, recommend that Oman's entrepreneurship policy objectives need to be focused upon creating a conducive entrepreneurial macro environment for wealth creation through innovation, produced via high impact new venture creation. This requires a comprehensive policy agenda which pulls together all

uncoordinated efforts into a coherent and strategy-driven entrepreneurship policy that can have a real and sustainable impact on the country's entrepreneurial activity. Magd & McCoy [9] concluded that Omani educational institutions have a role to play in developing programs relevant to differing needs of entrepreneurs from product development to exploring export opportunities. They perceive that educational institutions also need to play a key role in the provision of a sustainable supply of graduates with relevant knowledge and skills to be employed in and ultimately assist with the growth of small and medium enterprises in Oman. They view that an extensive review of barriers to female entrepreneurship in the Sultanate should be undertaken in order to determine if any key areas are specific to Oman. Therefore, this study was conducted to develop a scale to measure university students' attitudes toward entrepreneurship in Oman for the inculcation of entrepreneurial mindsets in students.

## II. STUDY QUESTION

This study will answer the following main questions:

1. What is the best scale and model to measure university students' attitudes toward entrepreneurship in Oman?
2. To what extent the items are reliable and loaded under their respective factors and constructs?
3. To what extent the factors are valid to represent entrepreneurship constructs?
4. What is the leading factor or predictor for entrepreneurship constructs?

## III. RELATED LITERATURE

### *Entrepreneurship*

There are a number of personal traits that have been associated with individuals that have a tendency towards entrepreneurship. Korunka et al. [10] mentioned three major psychological constructs that appear consistent with an entrepreneurial personality namely, a high need for achievement, internal locus of control, and a risk-taking propensity. Additional studies examine the possible link between the psychological variable and entrepreneurial personal qualities. Of these, two factors were mentioned: personality traits and cognitive factors traits were dimensions of individual differences that showed consistent patterns of thoughts, feelings, and actions [11, p16]. In addition, Zhao & Seibert[12] found that entrepreneurs scored higher on conscientiousness and openness to experience and lower in neuroticism and agreeableness. These traits were in line with the characteristics of an entrepreneurial personality profile which included a risk propensity.

With regards to a cognitive factor, Stevenson & Jaeillo[13] defined entrepreneurship as an orientation towards opportunity recognition. These views point to the importance of entrepreneurs' cognitive traits including perception, memory, information processing, and decision-making. Evidence gathered, mostly by economists, show that entrepreneurs seek autonomy more than the attainment of wealth. Other evidence suggests that they also seek variety [10]. Scarborough[5] points out a clear picture of the entrepreneurial personality including the desire for responsibilities, preference for moderate risks, confidence in their ability to succeed, desire for immediate feedback, a high level of energy, future orientation, skills at organizing and valuing achievement over money.

### ***Entrepreneurship in Education and Career***

With a growing number of colleges and universities students, it is the time to educate students to build businesses by offering courses in entrepreneurship and small business management. In the United States, for example, colleges and universities have discovered that entrepreneurship is an extremely popular course of study. Disillusioned with corporate America's downsized job offerings and less promising career paths, a rapidly growing number of students see owning a business as their best career option. Thus, more than 3,000 colleges and university offer courses in entrepreneurship to more than 200,000 students. In addition to this, many of them have trouble keeping up with the demand for these classes [5, p33].

One of the most comprehensive studies of global entrepreneurship concluded by the Global Entrepreneurship Monitor (GEM) shows significant variation in the rate of new business formation among the nation of the world when measured by Total Entrepreneurial Activity (TEA). Scarborough[5] indicates that entrepreneurial activity is essential to a strong global economy. Many of the world's largest companies continue to engage in massive downsizing campaigns, dramatically cutting the number of employees on their payrolls. For example, the United States and many other nations are benefiting from the surge in global entrepreneurial activity. Eastern European countries, China, Vietnam and many other nations whose economies were state-controlled and centrally planned, are now fertile ground for growing small businesses.

De Jorge-Moreno[14] evaluated the effect of participation in business and economics education programs on students' entrepreneurial intentions in terms of perceptions of the desirability and personal feasibility of starting a business. The results revealed that the explanatory factors for both types of students were different. This was attributed to the fact that students chose one career or another according to their expectations of employment. The student's

entrepreneurial intentions decreased when they progressed in their studies and they were in closer contact with the business sector. However, the students' entrepreneurial intentions increased when they chose a future work option different from working in public administration. Fayolle & Toutain[15] argued that entrepreneurship education should be conceptualized and designed, based on four educational principles: learning to understand the interplay of multiple social interactions, learning to navigate in a complex and dynamic environment, learning how to build and permanently revise knowledge and strategies and learning how to turn ideas into action.

Watts[16] examined the current promotional methods used by North Carolina community colleges to advance entrepreneurship education and identified practical strategies for improving promotional efforts and outcomes. Watts[16] highlighted the need for entrepreneurship education by asserting that entrepreneurship was a global concept. Entrepreneurship materials can and should be modified to meet the unique needs of students. Moreover, a holistic teaching approach allows the integration of entrepreneurship concepts and skills throughout the traditional business school curriculum. The study revealed that Business Centers rely heavily on local newspaper advertisements and non-targeted, direct mailings, despite the fact that these methods were also described as the least effective ways of promotion.

Moreover, Maritz et al. [17] provides an analytical overview of the current state of entrepreneurship education (EE) in Australia; placing emphasis on programs, curricula, and entrepreneurship ecosystems. The authors performed a contextual review of the literature by delineating entrepreneurship education programs, the entrepreneurial ecosystem, and EE learning and teaching. The review was enhanced by a systematic collection of data from higher education institutions web sites, depicting the prevailing situation of entrepreneurship programs, courses, subjects, and their ecosystems. From a curricular perspective, Australian universities offer 584 subjects related to entrepreneurship. This includes a dominance at an undergraduate level, representing 24 minors/majors and specializations in entrepreneurship. In total, 135 entrepreneurship ecosystems were identified.

### ***Students' Entrepreneurship Intentions and Leading Factors***

In relation to students' intentions towards entrepreneurship, previous literature has reported an inclination and declination of students' intentions towards taking entrepreneurship as a course and career. For further exploration of student intentions, Nishimura & Tristán [18] focused on the factors that led individuals to create new ventures. They drew on social psychology literature and applied the theory of

planned behavior to understand and predict nascent entrepreneurship. To test the integrity of this theory in predicting entrepreneurial behavior, the study used data from the Global Entrepreneurship Monitor (GEM) research program in Peru. The findings of the study provided partial support for the theory.

Jakopec et al. [19] generated a model according to the framework of the Theory of Planned Behavior and the Model of the Entrepreneurial Event. Data was collected from a sample of undergraduate students of economics. The results show that the self-assessment of entrepreneurial tendencies and abilities was positively associated with the perceptions of entrepreneurial self-efficacy and desirability of entrepreneurship, which also contributed positively to the explanation of entrepreneurial intentions. In addition, it was found that entrepreneurial tendencies and abilities only influenced entrepreneurial intentions indirectly, through entrepreneurial self-efficacy and desirability of entrepreneurship. Finally, entrepreneurial tendencies and abilities, entrepreneurial self-efficacy and desirability of entrepreneurship explained most of the variance of the entrepreneurial intentions.

Furthermore, Schwarz et al. [20] examined key factors influencing students' intent to create a new venture. Based on Ajzen's theory of planned behavior and Autio's model of intention, the researchers developed a model of entrepreneurial intent that incorporated both human and environmental factors. The proposed model aimed to focus on three constructs to predict entrepreneurial intent, i.e. general attitudes (towards money, change, and competitiveness), the attitude towards entrepreneurship, and the perception of the university environment and regional start-up infrastructure. Cases numbered at 2,124 were considered in the final analysis. A multiple linear regression model with attitudes, perceptions of environmental conditions, and selected control variables (age, gender, the field of study) was estimated to test the hypotheses. The study findings showed in terms of attitude toward competitiveness; all other paths regarding general and specific attitudes were significant. Pertaining to environmental conditions, only significant effects of the university on the students' interest in business were detected. In addition, significant differences in entrepreneurial intent regarding age, gender and field of study were found.

Rauch & Hulsink [21] use a quasi-experimental design to test the effectiveness of an entrepreneurship program, relying on the theory of planned behavior. The findings suggested that students participating in the entrepreneurship course with an (auto) biography assignment, compared to students who followed a different non-entrepreneurship course, showed an increase in antecedents of intentions (attitude, perceived behavioral control, self-efficacy). Furthermore, they had higher entrepreneurial intentions at the end of the

program. Finally, these students also pursued these intentions in their actual start-up behaviors. In addition to this, Samuel et al. [22] assessed entrepreneurial intention among the students of Sunyani Polytechnic, and also to determine the motivators, and obstacles to entrepreneurial intentions. The study was based on quantitative exploratory survey design. The sample size for the study was 136, comprising of 94 males and 42 females, who were selected by a convenient sample method. Primary data was obtained using a self-designed questionnaire which was administered by the researchers. Data were analyzed using percentages and a One-way ANOVA. The results indicated that there was high entrepreneurial intention among the respondents. It was also revealed that there were important motivators for intention as well as obstacles to setting up one's firm. The finding again indicated that demographic variables such as gender, age, religion affected responses given by the respondents.

A number of researchers took their investigation further by specifically investigating this intention looking into the role that gender and other student's demographic variables played. Tegtmeier & Mitra [23] summarized the trends in research on women's entrepreneurship with reference to university education and found that the quantum of past research endeavors remained limited despite the growing significance of the subject. They also found that developing a focused approach that was based on a female ontology of entrepreneurship, and one that identified specific contexts, and appropriate methodological considerations that enabled inquiry at different levels, were of value to future research. Furthermore, Sánchez-Escobedo et al. [24] analyzed the existence of gender differences in the perceptions and attitudes of university students towards entrepreneurship. They measured perceptions of the public image of an entrepreneur, along with the desirability, viability, and intentionality of students towards creating their own business. The empirical data for this research comes from a sample of university students who have attended a Business Creation program run by a venture capital association known as Fostering Entrepreneurship in Extremadura, Spain.

Shinnar et al. [25] investigated student and faculty attitudes towards entrepreneurship and entrepreneurship education. Data from 317 students and 87 faculty members at a comprehensive 4-year university were collected to examine the students' level of interest in entrepreneurial education, perceptions of motivations and barriers to startup businesses, and occupational aspirations. The study found that student and faculty views on entrepreneurship often differed dramatically, particularly in terms of students' occupational aspirations and the interest among non-business students. This suggests a significant opportunity to

formally expand entrepreneurship-related education beyond business schools. The study results demonstrated a lack of significant differences between male and female students regarding an interest in entrepreneurship.

### ***Entrepreneurship Intentions among Students: A Global Perspectives***

This paper enriches its argument and claim by reviewing studies around the globe on students' perceptions and intentions toward entrepreneurship programs, courses, and careers.

#### ***USA***

De Pillis & Reardon[26]conducted a study which examined persuasion and personality variables as predictors of entrepreneurial intention in a cross-cultural sample. Undergraduates in the USA and the Republic of Ireland completed measures of personal efficacy, achievement motivation, ambiguity tolerance, attitudes toward entrepreneurship, and entrepreneurial intention. The results suggested that the decision to become an entrepreneur came about differently in different cultures. US participants appeared to perceive entrepreneurship as a societally sanctioned and appropriate outlet for their achievement motivation. In both cultures, those who believed that being an entrepreneur was consistent with their self-image showed strong entrepreneurial intention independent of their other beliefs about entrepreneurship. The study suggested that recollections of positive interpersonal and mass media messages about entrepreneurship encouraged entrepreneurial intention--but only for US participants rather than Irish ones.

#### ***Europe***

Varblane & Mets [27] conducted a study to map the current situation of entrepreneurship education in higher education institutions of 22 European transition economy countries (e.g. Croatia and Slovenia). They found that the highest entrepreneurship orientation was found in new and private universities and colleges. In a majority of schools, the theory of entrepreneurship was taught but practice-oriented training in entrepreneurship was rather limited. The current number of centers of entrepreneurship in the region was small, and the research-oriented model of entrepreneurship education was used in three to five institutions only.

Rantanen & Toikko [28] analyzed the relationship between different social values of the Finnish welfare state. Survey data (N = 873) was gathered in an electronic format from secondary and vocational schools in the Helsinki–Uusimaa region, and questions were based on a multiple-choice Likert scale. The analysis was undertaken using statistical methods. It was found that young Finnish people considered entrepreneurship as a first and foremostpragmatic career option, which was not

supported by ideological arguments or assumptions. On the other hand, the connection between social values and entrepreneurial orientation remained largely at the level of attitudes. On a practical level, entrepreneurship was not thought to be an attractive career option.

In Spain, Sánchez [29] tested the effect of entrepreneurship education programs on the entrepreneurial competencies and intention of university students in order to confirm (or disconfirm) conventional wisdom that entrepreneurial education increases intentions to start a business. He used a pretest-post-test quasiexperimental design. Data was collected from 864 university students of Castilla & León (Spain), (403 taking the program and 460 in a control group). The results showed that students in the 'program' group increased their competencies and intentions towards self-employment, whereas students in the control group did not.

#### ***Africa***

Ekore & Okekeocha[30] examined the role of psychological factors, especially fear of failure as an entrepreneur among university graduates, in Nigeria. A specially-developed questionnaire was completed by 1100 university graduates (729 males and 371 females) with a mean age of 32 years. The findings confirmed core self-evaluation as influencing fear of entrepreneurship. Also, pre-entrepreneurial intention, attitude, and capacity significantly predicted fear of entrepreneurship. This suggests that these factors need to be considered in the selection, placement, and training of university graduates for entrepreneurship.

Nabi et al. [31] identified the differences between African and European students with regard to their entrepreneurial intentions, attitudes towards entrepreneurship, role models and entrepreneurial experience. A quantitative empirical research design was applied, using self-administered questionnaires. Questionnaires were distributed to first-year business students at universities in three African countries that were either developing (Uganda and Kenya) or emerging (South Africa) and four European developed nations (Finland, Germany, Ireland, and Portugal). The results indicate that students from developing/emerging economies were more likely to envisage future careers as entrepreneurs and were more positive towards entrepreneurship than their industrialized European counterparts, even though motivators for employment/self-employment were similar across the samples. The type of role models used and the extent of entrepreneurial experience varied between individual countries.

#### ***Asia***

Jafari-Moghadam & Fakharzadeh [32] analyzed Iranian literature textbooks at an elementary level, in order to study the extent of entrepreneurial

attitudes, from cognitive, affective and behavioral aspects, and how they could be increased. They analyzed all the literature textbooks such as reading and writing books of five grades at an elementary level in Iran that were published in 2010, using a qualitative content analysis method. In the analysis, the entrepreneurial attitude was broken down to five categories, with reference to entrepreneurship literature models such as Robinson's (1991). These categories were as follows: the need for achievement, creativity, and innovation, perceived self-control, self-efficacy and the opportunity recognition. The validity of the tools was confirmed by a number of specialists and their reliability was estimated by the pie-Scott coefficient, which was over than 80%. The analysis of data gathered by content analysis was done by descriptive and deductive statistic methods. The results showed that in all the reading textbooks, which included text, questions, and pictures, 24.8% of all the units considered entrepreneurial attitude. In the writing of the textbooks, this percent was equal to 54.9%. In the subjects of reading book lessons, 22.15% attended to entrepreneurial attitude categories. Creativity and innovation, among other categories, had the most frequency in all the books and opportunity recognition had the least. Moreover, there was a significant difference in the frequency of five categories. On the other hand, the textbooks of third grade had the most and first grade textbooks had the least frequency. In the attitude component, the affective component in reading books and the behavioral one in writing books was significantly higher than others. The cognitive component had the least scale in all the books.

Based on this vast literature, entrepreneurship programs and courses are well known and important, although, its importance is reported to be varied across individuals. Literature has also reported that students tend to take entrepreneurship as a course and career as it is related to the future and business. It was reported to be a very important course and program for students that were willing to become self-employed or work in the business industry. In addition, entrepreneurship education has also been reported to help students and to increase their competencies especially positive attitudes toward entrepreneurship. Although, some students looked at it from a negative perspective and tended to have low perceptions toward the program. But in general, students believed or perceived entrepreneurship as a good program and career. In light of this, it is worth developing a scale that can help determine students' intentions and examine their skills before they enroll.

#### **IV. METHODS**

This study used a quantitative design to validate the university students' attitudes towards an entrepreneurship instrument and to determine its reliability. In terms of population, the total population

of the study consisted of all Sultan Qaboos University (SQU) students which were 15402 students in the academic year 2014/2015. In the university, students came from different parts of Oman to study at SQU. Data was collected from 749 students, which was about 5% of the total population. Only complete cases with no missing data were used for the analysis in this study. This was 592 cases, of which 289 were males (48.8%), and 303 (51.2%) were females.

#### ***Instrument Development Process & Procedure***

For the development of the Scale for Measuring University Students' Attitudes toward Entrepreneurship, the instrument or questionnaire was self-developed. The development of the instrument began by reviewing the literature and previous studies which had scales and models to measure people's attitudes toward entrepreneurship were presented. The literature included Gelardin et al. [33], Chang & Rieple[34], Smith et al. [35], and Pihie et al. [36]. In addition, the study used The Mayers-Briggs Type Indicator [37] which was developed by (C. G. Jung). The students' attitudes were measured by their tendency towards entrepreneurship which was based on four domains: personal skills, technical skills, managerial skills, and leadership skills.

These domains included a total of 65-items, as presented in Table 1 that focused on the university student attitudes toward entrepreneurship. The four domains consisted of personal skills (17-items), technical skills (12-items); managerial skills (17-items), and leadership skills (13-items). The domains were measured on a five-point Likert scale ranging from "very high" to "very low". The mean, standard deviations, t-tests and one-way analysis of variance were performed to determine whether there were differences between the respondents' means.

#### **V. RESULTS**

##### ***PLS Path Assessment and Model***

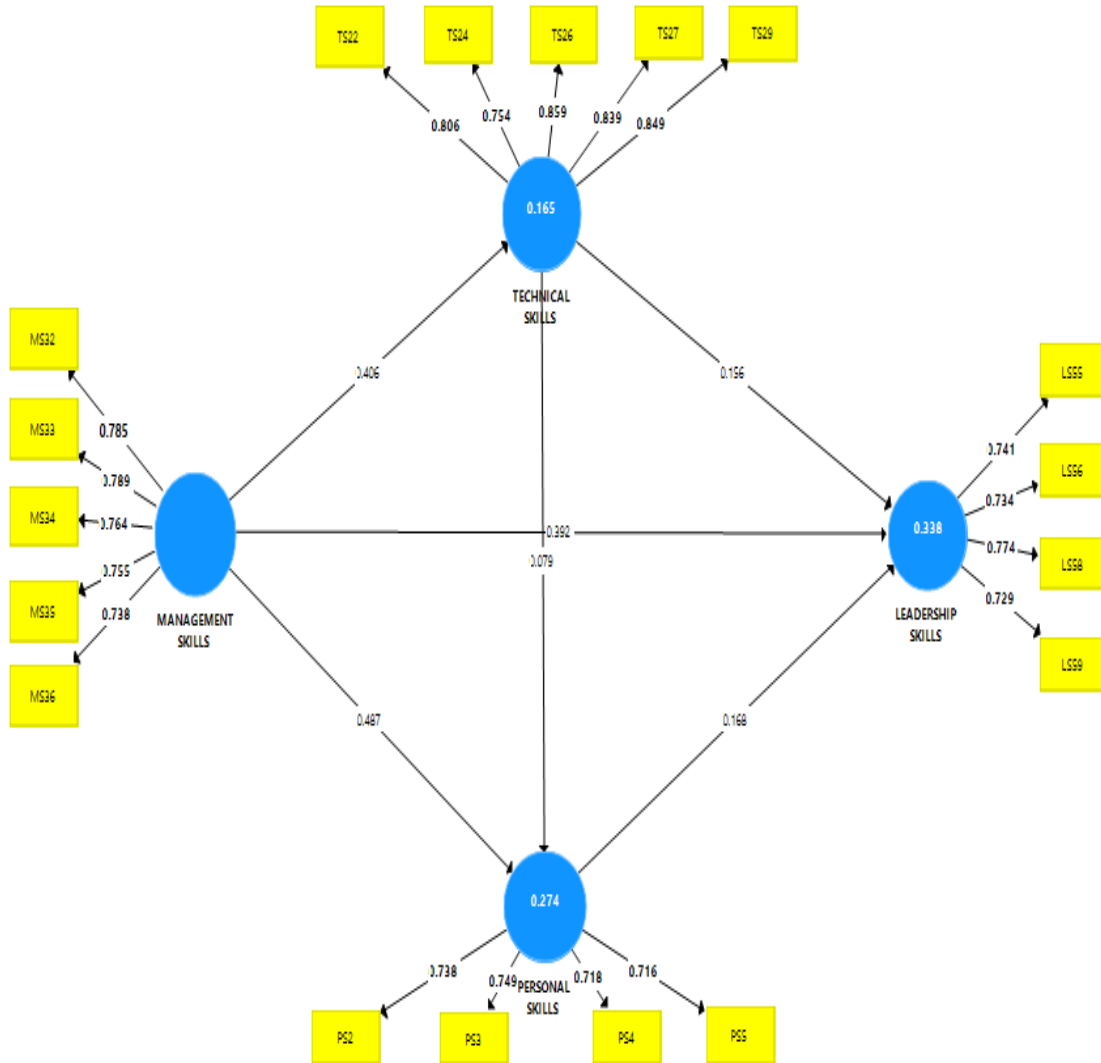
In this study, the PLS-SEM was used to validate the instrument and its reliability. Scholars now accept the PLS-SEM method as a more robust estimation for the structural model[38]. In addition, when the CB-SEM distributional assumption failed to be met, the PLS-SEM is now perceived as an alternative method [39]. This is due to the unrealistic demand of the CB-SEM information and distribution in the field of social sciences and other fields of inquiry[40]. The PLS-SEM is suitable and appropriate if the aim of research is to predict and develop a theory. PLS-SEM allows researchers to simultaneously check the reflective and formative constructs in terms of item loading, reliability, and validity. It accepts normal and non-normal distributions and estimates outer weight and loading [41]. Moreover, the PLS Path Model (PLS-PM) was used in this study to validate exploratory models of

student attitudes towards entrepreneurship in Oman and prediction research as recommended by Henseler et al. [38] and Dos Santos et al. [42]. Therefore, to use the PLS-SEM, Henseler et al. [38] recommended a two-step technique:

1. Assessment of a measurement model
2. Assessment of a structural model.

In this study, before the evaluation of the model, SPSS was used for data cleaning and screening. This is done by checking the missing data and ensuring they were deleted or removed from the data set. After data screening, the assessment of the measurement model was carried as shown in Fig I

**Assessment of a Measurement Model**



**Figure I**  
Measurement Model of Student's attitude towards Entrepreneurship

Since the PLS-SEM is for prediction and exploration, to confirm the reliability and validity of the items and constructs, one factor has to be positioned as an independent variable and the rest as dependent variables. In this paper, management skills factor was placed as the independent variable. Thus, under PLS-SEM, there would not be R square value or R square adjusted assigned to management skills as the independent variable is the manipulator while dependent variables are the manipulated ones. In this paper, the process of determining reliability and validity was done in accordance with Hair et al. [39]

and, Hair et al. [43-44] suggestion by looking at individual item reliability, dimensions, internal consistency reliability and discriminant validity [45]. The PLS-SEM is appropriate at this operation as the PLS-SEM measurement model assessment ensures the construct and its selected items are suitable and the items are well represented the construct [46].

Table 1 presents the measurement model's results. A number of original items were deleted during the reliability and construct validity process as the deleted items failed to yield the required

reliability for item loading and a failure to load under their respective factors.

As illustrated in Table 1, Leadership Skills maintained four items, Management Skills maintained five items, Personal Skills had four items and Technical Skills had five items. The Smart PLS

3.2 algorithm was used to analyze the model with 4 factors of the entrepreneurship scale as indicated in Figure 1. To determine the goodness of the model, the reliability and validity of the entrepreneurship instrument were tested.

**TABLE 1**  
Reliability and Validity of Students' Attitudes Towards the Entrepreneurship Scale

Construct	Factor Loading	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
<b>Leadership Skills</b>		0.73	0.73	0.83	0.55
LS55	0.74				
LS56	0.73				
LS58	0.77				
LS59	0.73				
<b>Management Skills</b>		0.82	0.83	0.88	0.59
MS32	0.79				
MS33	0.79				
MS34	0.76				
MS35	0.76				
MS36	0.73				
<b>Personal Skills</b>		0.71	0.71	0.82	0.53
PS2	0.74				
PS3	0.75				
PS4	0.71				
PS5	0.72				
<b>Technical Skills</b>		0.88	0.88	0.91	0.68
TS22	0.81				
TS24	0.75				
TS26	0.86				
TS27	0.84				
TS29	0.85				

**Reliability**

This study determined the reliability for each item and construct of the students' attitudes towards entrepreneurship by checking the Cronbach's Alpha, Composite Reliability and Rho\_A coefficient. For high inter-item consistency, a Cronbach's Alpha that is above 0.6, a Composite Reliability and Rho\_A coefficient that ranges from 0.7 or is greater, is considered as acceptable, according to Fornell and Larcker[47] and Tharim et al. [48]. In this study, Table 1 shows that the Cronbach's Alpha reliability values for each formative construct ranged between 0.71 to 0.88, while the Composite Reliability in the PLS measurement model ranged between 0.82 to 0.91. For Rho\_A, it ranged between 0.71 and 0.88. It can be concluded that the reliability values achieved from each formative construct were reliable

and consistent to measure the students' attitudes in Oman towards the entrepreneurship instrument.

**Validity**

To perform the validity test for students' attitudes in Oman towards the entrepreneurship instrument, the Average Variance Extracted (AVE) and Discriminant Validity were calculated. According to Hair et al. [44], Convergent Validity can be assessed by checking the factor loadings in the measurement model, composite reliability and average variance extracted [48]. Looking at Table 2, this is an indication that, each item in the formative construct exceeded the threshold of 0.5 given or suggested by Hair et al. [44]. Therefore, we confirm the validity of the constructs for students' attitudes toward the entrepreneurship scale.



**TABLE 2**  
Discriminant Validity of Students' Attitudes Toward the Entrepreneurship Scale (Fornell-Larcker Criterion)

	Leadership Skills	Management Skills	Personal Skills	Technical Skills
Leadership Skills	0.74			
Management Skills	0.54	0.77		
Personal Skills	0.41	0.52	0.73	
Technical Skills	0.36	0.41	0.28	0.82

For further investigation on the validity of the entrepreneurship scale, this study also assessed the Discriminant validity to investigate the level of variable accuracy by ensuring one variable in the model did not measure another or a different variable as suggested by Tharim et al. [48]. As a rule of thumb, to confirm or assure discriminant validity, the value of HTMT should be less than 0.90. Therefore, we can conclude that the value HTMT in this study was less than 0.90, as shown in Table 3. Hence, the constructs and the entire entrepreneurship scale were divergent, uncorrelated and there was no overlap.

**TABLE 3**  
Collinearity Statistics, T-Statistics and P-values

Item	Collinearity Statistics	T Statistics	P Values
LS55	1.40	28.60	0.001
LS56	1.33	34.92	0.001
LS58	1.49	43.23	0.001
LS59	1.37	33.86	0.001
MS32	1.79	47.52	0.001
MS33	1.85	44.26	0.001
MS34	1.66	34.29	0.001
MS35	1.70	34.94	0.001
MS36	1.58	34.47	0.001
PS2	1.35	27.93	0.001
PS3	1.44	35.83	0.001
PS4	1.33	26.61	0.001
PS5	1.25	28.23	0.001
TS22	1.99	52.79	0.001
TS24	1.73	38.27	0.001
TS26	2.58	73.60	0.001
TS27	2.36	66.87	0.001
TS29	2.39	73.50	0.001

This study also checked for collinearity which was perceived as a Variance Inflation Factor (VIF) and part of the assessment of Discriminant validity. As a rule of thumb, the values of construct VIF should be less than 5 [48]. Based on the result in Table 3, we can conclude that there is no collinearity among the entrepreneurship constructs.

For the structural model in PLS, the path coefficient represents standardized regression coefficients in SPSS. To confirm or suggest the significance of a path coefficient, it is expected to

exceed 0.10. In the present study, looking at Figure 1, the regression weight of one construct to another exceeded 0.10, between technical skills and personal skills. Hence, 40% of the variance was explained between Management Skills and Technical Skills, 48% for Personal Skills and 39% for Leadership Skills. There was a total of 15% of the variance between Technical Skills and Leadership Skills and 16% between Personal Skills and Leadership Skills, which was very low, while less 10% was between Technical Skills and Personal Skills. Nevertheless, in terms of the best construct that represented or predicted entrepreneurship from the students' perspectives, for Research Question 4, Technical Skills tended to be the best predictor for entrepreneurship as it had the highest factor loading. The aim of this study was to validate and provide better reliability of the Omani students' attitudes towards the entrepreneurship scale instead of testing the predictions.

## VI. DISCUSSION

The findings of this study used the Smart PLS for scale development and the assessment of the measurement model performed. This entrepreneurship scale can be used in other educational contexts in Oman to measure student perceptions toward entrepreneurship intentions or as their careers. Thus, it can even be used in non-educational sectors to measure people's attitudes or mindsets towards entrepreneurship. As was mentioned in the literature, there were many factors that could contribute to the students' intentions or influence their perceptions towards entrepreneurship. However, entrepreneurship still remains as an interesting course for university and college students in Oman, which is aligned with Varblane & Mets [27] study, which found that the highest entrepreneurship orientation was found in new and private universities and colleges in Europe.

In addition, the students' attention towards entrepreneurship was still high around the globe. Educational researchers have attempted and provided scales to measure entrepreneurship intentions among students. This is an indication of the importance of student entrepreneurship programs or for it to be a career, especially in developing countries. In Oman, there is a scarcity of research on student entrepreneurship and there is no record of scales in Oman measuring students' attitudes toward entrepreneurship. This is in line with the study of

Nabi et al. [31] on identifying differences between African and European students in terms of entrepreneurship intentions. It was found that students from developing countries were in need of an entrepreneurship course for their future careers compared to students from developed nations.

## VII. CONCLUSION

This study examined and concluded with a scale for entrepreneurship skills for university students. Four variables, leadership, personal, managerial and technical skills, formed the latent variables of entrepreneurship. The confirmatory factor analysis showed that the model fit the data well, as indicated by all fit indices. The sample for this analysis was restricted to Omani students at the Sultan Qaboos University. Future research can validate the results of this study by including students from other countries. In addition, other sets of skills can be examined if they belong to the construct of entrepreneurship such as enterprise skills, technology or legal skills [49]. From a practical perspective, universities can infuse the skills suggested by the model in their entrepreneurship training programs in curriculums or out-of-curriculum activities and programs.

Furthermore, the scale could be further developed in another context by examining the consistency of the reliability of items and validity of the constructs. Furthermore, which construct mostly or highly (Leadership skills, technical skills, personal skills, and management skills) predicted students' entrepreneurship among students can also be explored. Last not the least, since the participants of this study only included students from the Sultan Qaboos University, Oman. Thus, it is recommended that Omani future researcher(s) or studies test this scale among other universities students in Oman for consistency.

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