

## A COMPOSITE INDEX FOR QUANTIFYING ENTREPRENEURIAL SKILLS IN EMERGING ENTERPRISES

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### Abstract

The principal aim of the research work in this paper was to construct a composite index that could be used for the measurement of basic entrepreneurial competence in emerging enterprises operating in South African townships in Gauteng Province, South Africa. The research was based on a sample of 432 small, micro and medium-sized enterprises (SMMEs) that operate in Gauteng Province. In each business enterprise, entrepreneurial competence was measured by using a composite index consisting of 5 dimensions. These 5 dimensions are talent for creativity (measured by using 3 items), willingness to take reasonable risk (measured by using 12 items), efficiency in responding to business opportunities (measured by using 15 items), business leadership quality (measured by using 18 items), and efficiency in taking advantage of programmes of assistance that are offered to emerging SMMEs by the South African Government (measured by using 11 items). The scales used for measuring entrepreneurial skills were adapted from similar work done by Worku (2018:295-308) in the textile industry of Tshwane, South Africa. The results showed that about 70% of participants had satisfactory entrepreneurial skills, whereas the remaining 30% of participants did not. Regression coefficients and goodness-of-fit statistics obtained from structural equations modelling (Muller and Hancock, 2019) showed that the level of entrepreneurial skills was significantly influenced by 3 factors. These 3 factors were ownership of business, long duration of business operation (6 years or longer) and the ability to use business intelligence methods to gather information about business decisions and activities carried out by rivals and competitors.

**Keywords:** Gauteng Province, Entrepreneurial skills, Structural Equations Modelling

### Introduction and background to study

Lessons learned from developed economies of the world show that there is significant benefit in exposing the youth to basic entrepreneurial education and skills at an early stage by way of aligning the educational curriculum to vocational, artisan, commercial and industrial needs. Worku (2018, pp.295-308) has quantified the level of entrepreneurial skills possessed by emerging entrepreneurs in the textile industry of Tshwane, South Africa, and has found that the local textile industry was losing substantial ground to foreign producers, suppliers and competitors due to lack of specialised skills in entrepreneurial, networking, marketing and manufacturing skills. Tahoori and Ghasemi (2017) have shown that exposing young learners to design and production skills used by BMW has significant benefits for motivating the youth to consider fields such as architecture, automotive design and engineering. Almahry, Sarea and Hamdan (2018) have shown that there is a significant relationship between childhood level education on entrepreneurship and entrepreneurial skills that are needed in local markets in Germany. Blankesteyn, Bossink and Van der Sijde (2021) have shown that integrating entrepreneurial education to the curriculum, knowledge of theory and practice of entrepreneurship, exposure to entrepreneurial education and use of research are key factors that are highly valuable to the youth. The authors have shown that science-based entrepreneurship education is highly valuable for promoting the mastery and transfer of technologies that are required for pursuing entrepreneurship as a career. Liguori, Muldoon and Bendickson (2020) have shown that encouraging the youth to think freely, encouraging the youth to master numeracy, analytical, communication and networking skills, challenging conventional wisdom and traditional methods that are used for conducting business, integrating lessons that are taught in classrooms to practical applications by taking them to industrial and commercial sites are highly helpful for promoting entrepreneurship among the youth. Polowczyk, Zaks and Trapczynski (2021) have assessed factors that affect viability in start-up SMMEs in Israel, and have found that the survival of newly established businesses depends upon their ability to identify a gap in an industry along with a feasible service delivery solution to the gap they have identified at a cost that is less than the prevailing cost in the market, without lowering service delivery norms and standards. Inanna, Rahmatullah, Haeruddin and Marhawati (2020) have shown that the promotion of education on entrepreneurial skills such as silk weaving must be implemented at an early stage of development by using a variety of innovative methods of production that are suitable for enhancing the quality and efficiency of production without lowering quality standards. Liguori, Muldoon and Bendickson (2020) have shown that early childhood exposure to basic entrepreneurial skills is a key motivating factor among young college graduates for embarking on entrepreneurship. Blankesteijn, Bossink and Van der Sijde (2021) have shown that exposing young children to evidence-based entrepreneurial education is highly valuable for enhancing the mastery and transfer of technological skills that are essential for entrepreneurial activities. Worku and Muchie (2020) have conducted a survey by collecting data from all 50 technical and vocational educational training colleges in South Africa, and have shown that there is a dire need for aligning the curriculum taught to learners to the needs of industry, commerce, business and government. Olutuase, Brijlal and Yan (2020, p.4) have argued that the youth should be educated on how to use entrepreneurship for creating livelihood. Madzivhandila and Musara (2020, p.257) and Worku (2016) have found significant relationship between poor municipal services and a high rate of failure in South African emerging SMMEs. The authors have shown that it is possible to foster sustained profitability, viability and resilience in entrepreneurship by way of enhancing the quality of services that are rendered to small businesses by local municipalities. The research work carried out by Traore, Muchie and Worku (2020) has shown that the ability of the South African Government to attract foreign direct investment in large volumes and willingness to liberalise cumbersome regulations that are applicable to the free flow of skilled employees, capital, goods and services is a key determinant of success in fulfilling the practical needs of emerging SMMEs in South Africa.

### Objectives of study

The main aim of research was to quantify the level of entrepreneurial skills among a sample of 432 emerging small, micro and medium-sized enterprises (SMMEs) operating in Gauteng Province, South Africa by using a composite index that is tailor-made to the basic operational needs of South African emerging SMMEs.

### Literature review

Marivate (2014, p.54), Herrington (2018, p.3), Ntshani (2020, p.236), Worku (2020, p.629) and Nthite and Worku (2019, p.96) have argued that emerging SMMEs in Gauteng Province and elsewhere are not benefiting from the Skills Development Programme initiated by the South African Government. Although sector-specific skills development and training programmes have been rolled out since April 1994 in various economic sectors, the above authors have shown that emerging SMMEs in all parts of South Africa have failed to benefit significantly from such programmes. Schroder and Storm (2020) and Schmulow (2020) have identified various regulatory obstacles and cumbersome bureaucratic procedures that hinder the free flow of foreign direct investment into South Africa. These obstacles are related to unaffordable and untenable labour-related regulations, failure to restrain and control trade unions, political interference, disregard for technical merits by political appointees, difficulties in business registration and business license renewals, and difficulties in obtaining travel visas to South Africa. According to the authors, foreign direct investors are often deterred by lack of economic stability and difficulty in the recruitment of skilled manpower from outside South Africa. Sector-specific and tailor-made training programmes are provided to emerging SMMEs by the South African Sector Education and Training Authority (SETA, 2021) on a regular basis with a view to alleviate the dire need for practical entrepreneurial, networking and marketing skills in emerging SMMEs. Table 1 shows details about vocational and skills-based practical training services that have been provided to various economic sectors in the financial year 2019/2020. The table indicates that vocational trainings have been provided to emerging SMMEs according to plan, whereas the plan to provide similar training

opportunities to artisans was not accomplished as planned. This failure is despite the dire need for sector-specific artisan skills that are needed in emerging SMMEs that operate in South African townships, locations and cities.

Table 1: Sector-specific vocational training opportunities provided in 2019/2020

Field of sector-specific training	Planned	Achieved
Number of skills programmes entered	4000	2300
Training of employees working for NGOs	100	101
Tailor-made vocational training to emerging SMMEs	600	635
Provision of technical assistance to organisations	500	600
Tailor-made vocational training to emerging artisans	2900	689
The successful completion of infrastructural projects	15	15
General training on human resources management	85%	88%
The successful completion of public-private projects	200	557
Processing of the enrolment of learners	3075	2575
Number of artisans trained successfully	720	253
Projects successfully completed by universities	8	9
Commencement of learnership trainings	18000	5265
Successful completion of learnership trainings	11459	10363
Commencement of bursaries to trainees	3500	1237
Successful completion of bursaries by trainees	1800	2152
Commencement of funds to trainees	6425	2470
Commencement of internship trainings	7590	3498
Number of internships completed	6053	4436

Source: Services SETA (2021)

Almahry, Sarea and Hamdan (2018) have shown that novice entrepreneurs can be transformed successfully by use of mentorship and close supervision in which they are provided with practical lessons, supervised, assessed and evaluated on a regular basis until they demonstrate complete mastery of skills. This result is consistent with findings reported by Marivate (2014, pp.53-72) based on a 5-year-long study of emerging SMMEs in Gauteng Province. Madzivhandila and Musara (2020) and Nhamo, Rwizi, Mpandeli, Botai, Magidi, Tazvinga and Mabhaudhi (2021) have shown that providing efficient municipal services to emerging SMMEs enables them to reduce their cost of doing business. Henderson (2021) and Goolsbee and Syverson (2021) have identified various causes of economic loss and decline in the South African economy. According to the authors, the major cause of failure is inability to grow the economy at the pace the South African population is growing. According to Statistics South Africa (2021), the South African Gross Domestic Product (GDP) had shrank by 6.43% in the year 2020, mostly due to economic losses attributed to the outbreak and spread of the Covid-19 virus. In the year 2021, the GDP has managed to grow at a rate of 5%. South Africa has a population of 60.14 million and an unemployment rate of 34.9% (Statistics South Africa, 2023).

**Methods and materials of study**

The composite index used for the measurement of entrepreneurial skills consists of 5 dimensions. These dimensions are talent for creativity (measured by using 3 items), willingness to take reasonable risk (measured by using 12 items), efficiency in responding to business opportunities (measured by using 15 items), business leadership quality (measured by using 18 items), and efficiency in taking advantage of programmes of assistance that are offered to emerging SMMEs by the South African Government (measured by using 11 items). Worku (2018), Greenstone, Mas and Nguyen (2020) and Hahn, Minola, Bosio and Cassia (2020) have constructed practical frameworks for the measurement of basic competence in entrepreneurial skills. The composite index used for measuring the level of entrepreneurial skills of emerging entrepreneurs in this particular study is based on the matrix of indicators used by Worku (2018) for quantifying the level of entrepreneurial skills among emerging entrepreneurs in the textile industry of Tshwane in Gauteng Province, South Africa. Frequency percentages were used for the measurement of attributes or proportions. The variance of estimation is mathematically equivalent to the variance of the proportion estimator statistic. The sample size of study (n=432) is fairly large. All variances of estimation for proportions were quite small. Tests of normality confirmed that the assumption of normality was satisfied (Ross, 2020). Tools used for the measurement of items corresponding to the 5 dimensions of entrepreneurial skills were tested in the field by conducting a pilot study in order to ascertain content validity. All Cronbach Alpha coefficients of attributes were greater than 0.75 in magnitude. As such, all measurements and their corresponding precisions of estimation were adequate for the study (Washington, Karlaftis, Mannering, & Anastasopoulos, 2020).

**Results of study**

Table 2 shows a profile for the 432 participants of study. About 61% of participants were owners. About 60% of participants had Bachelor's degrees or more as academic qualifications. About 57% of participants had worked as entrepreneurs for 11 years or longer at the time of the survey. About 75% of businesses were operated by 5 or fewer people.

Table 2: Profile of participants of survey (n=432)

Characteristic	Number of respondents and percentage
Business ownership by participant of study	Owner: 246 (56.94%) Employee: 91 (21.06%) Both owner and manager: 17 (3.94%) Administrator: 46 (10.65%) Shareholder: 32 (7.41%)
Highest level of formal education	Grade 12 or less: 51 (11.81%) Certificate: 32 (7.41%) Diploma: 89 (20.60%) Bachelor's degree: 209 (48.38%) Honours degree: 19 (4.40%) Master's degree: 29 (6.71%) Doctoral degree: 3 (0.69%)
Length of business operation	5 years or less: 57 (13.19%) 6 to 10 years: 134 (31.02%) 11 to 15 years: 145 (33.56%) 16 to 20 years: 76 (17.59%) 21 years or more: 20 (4.63%)
Number of people employed in businesses in the survey	2 or fewer people: 23 (5.32%) 3 to 5 people: 303 (70.14%) 6 to 10 people: 23 (5.32%) 11 people or more: 83 (19.21%)

Table 3 measures creativity based on 5 items. The table shows that about 74% of participants were capable of generating new business ideas and using innovative ways of conducting business.

Table 3: Measurement of creativity based on 5 items (n=432)

Measurement of creativity based on 5 items	Low	Below average	Average	Above average	igh
Generating new business ideas	8%	18%	49%	19%	6%
Interest in innovative ways of conducting business	9%	17%	48%	20%	6%
Experimenting with new business ideas	6%	20%	50%	18%	6%
Persistence in succeeding in entrepreneurship	3%	21%	51%	19%	4%
Attendance of business symposiums, meetings and conferences	9%	17%	47%	21%	6%

Table 4 measures risk appetite based on 5 items. The table shows that the majority of participants were prepared to accept reasonable risk in the course of conducting business.

Table 4: Measurement of risk appetite based on 5 items (n=432)

Measurement of risk appetite based on 5 items	Low	Below average	Average	Above average	High
Level of specialised education acquired in entrepreneurship	9%	17%	49%	17%	8%
Attendance of training programmes in entrepreneurship	10%	16%	48%	21%	5%
Level of risk taken by entrepreneur in the course of taking an investment decision	5%	21%	48%	20%	6%
Investment goal	4%	20%	49%	20%	5%
Level of comfort in current business activity	7%	19%	48%	21%	5%

Table 5 measures responsiveness to business opportunities based on 15 items. The table shows that the majority of participants were fairly well capable of responding to business opportunities.

Table 5: Measurement of responsiveness to business opportunities (n=432)

Responsiveness to business opportunities based on 15 items	Low	Below average	Average	Above average	High
Quality of relationship with business customers	10%	16%	47%	17%	10%
Ability to assess and evaluate the degree of satisfaction of customers on a regular basis	9%	17%	48%	22%	4%
Ability to identify change in preferences of business customers	5%	21%	48%	20%	6%
Ability to handle customers with care	4%	20%	49%	20%	5%
Ability to identify business disruption	7%	19%	48%	21%	5%
Ability to manage business disruption	8%	18%	49%	19%	6%
Ability to adapt to change in business operation	9%	17%	48%	20%	6%
Ability to meet expectations of customers	6%	20%	50%	18%	6%
Ability to network with business rivals and competitors	3%	21%	51%	19%	4%
Ability to assess and evaluate market conditions	5%	21%	47%	21%	6%
Ability to provide prompt attentiveness to customers	5%	21%	48%	20%	6%
Ability to follow-up issues that matter to customers	4%	20%	49%	20%	5%
Willingness to accept constructive comments and suggestions from customers	4%	22%	48%	21%	5%
Willingness to learn valuable skills from business rivals and competitors	4%	22%	49%	20%	5%
Level of respect afforded to customers	4%	22%	48%	18%	8%

Table 6 measures the quality of business leadership based on 18 items. The table shows that the majority of participants possessed business leadership skills.

Table 6: Measurement of the quality of business leadership (n=432)

	Low	Below average	Average	Above average	High
Knowledge of the core values of business	9%	17%	48%	20%	6%
Degree of relevance of business plan to the vital needs of customers	6%	20%	50%	18%	6%
Ability to ensure value for money for customers	3%	21%	51%	19%	4%
Knowledge of markets	5%	21%	47%	21%	6%
Ability to create business opportunities that are beneficial to customers	5%	21%	48%	20%	6%
Degree of adherence to basic business ethics principles	4%	20%	49%	20%	5%
Degree of adherence to basic corporate social responsibility principles	4%	22%	48%	21%	5%
Degree of enthusiasm for meeting the business needs of customers	9%	17%	48%	20%	6%
Degree of loyalty to customers	10%	16%	47%	17%	10%
Level of personal integrity in the eyes of customers	9%	17%	48%	22%	4%
Degree of commitment to customers	5%	21%	48%	20%	6%
Ability to take initiative to meet the business needs of customers	4%	20%	49%	20%	5%
Ability to make accurate judgement promptly	7%	19%	48%	21%	5%
Courage to take appropriate business decisions promptly	8%	18%	49%	19%	6%
Quality of relationship with customers	9%	17%	48%	20%	6%
Decisiveness on the effective management of core business activities	10%	16%	47%	17%	10%
Degree of dependability in the eyes of customers	9%	17%	48%	22%	4%
Ability to handle sensitive issues in dealing with customers	5%	21%	48%	20%	6%

Table 7 measures the ability to exploit rights that are made available due to prevailing circumstances fully based on 11 items. The table shows that the majority of participants were capable of exploiting their basic legal rights fully in the course of conducting business.

Table 7: Measurement of the ability to exploit rights fully (n=432)

The ability to exploit rights made available due to prevailing circumstances based on 11 items	Low	Below average	Average	Above average	High
Knowledge of rights that are of potential benefit	5%	21%	47%	21%	6%
Degree of readiness to exploit a business opportunity	5%	21%	48%	20%	6%
Ability to use business intelligence for market assessment	4%	20%	49%	20%	5%
Knowledge of municipal bylaws on business registration and licence renewal	4%	22%	48%	21%	5%
Ability to draw up a business plan	9%	17%	48%	20%	6%
Ability to manage bureaucratic procedures successfully	10%	16%	47%	17%	10%
Oral presentation skills	9%	17%	48%	22%	4%
Marketing skills	5%	21%	48%	20%	6%
Networking skills	4%	20%	49%	20%	5%
Ability to sell innovative ideas to potential customers	7%	19%	48%	21%	5%
Ability to raise capital needed for conducting business activities	8%	18%	49%	19%	6%

Table 8 measures overall competence in entrepreneurial skills by using a 5-point ordinal scale. The table shows that 69.68% (301 out of 432) of participants of the research had satisfactory entrepreneurial skills. The remaining 30.32% (131 out of 432) did not have satisfactory entrepreneurial skills.

Table 8: Measurement of entrepreneurial skills by using a 5-point ordinal scale (n=432)

Characteristic	Number of respondents and percentage
Entrepreneurial skills of participants	Good: 48 (11.11%), Above average: 87 (20.14%), Average: 166 (38.43%) , Below average: 82 (18.98%), Low: 49 (11.34%)

Table 9 measures overall competence in entrepreneurial skills by using a binary scale. The table shows that 69.68% (301 out of 432) of participants of the research had satisfactory entrepreneurial skills. The remaining 30.32% (131 out of 432) did not have satisfactory entrepreneurial skills.

Table 9: Measurement of entrepreneurial skills by using a binary scale (n=432)

Characteristic	Number of respondents and percentage
Entrepreneurial skills of participants	Adequate: 301 (69.68%), Inadequate: 131 (30.32%)

Table 10 compares businesses that are competent (n1=301) with regards to entrepreneurial skills with businesses that are not competent enough (n2=131) with regards to entrepreneurial skills. The table shows that business in which there are adequate entrepreneurial skills are operated by actual owners, and not by employed managers. They also have relatively better networking, marketing skills. Such businesses use e-commerce, online, social media effectively. They have relatively older. They are operated by people who are relatively better educated and use business intelligence methods fairly well.

Table 10: Comparison of businesses with regards to general characteristics (n=432)

Variable of comparison	Group 1 (n1= 301)	Group 2 (n2=131)
Ownership of business premises	Own: 81%, Rent: 19%	Own: 29%, Rent: 71%
Competence in networking	Adequate: 74%, Inadequate: 26%	Adequate: 53%, Inadequate: 47%
Competence in marketing	Adequate: 73%, Inadequate: 27%	Adequate: 41%, Inadequate: 59%
Use of e-commerce for conducting business	Adequate: 32%, Inadequate: 68%	Adequate: 6%, Inadequate: 94%
Use of business intelligence	Adequate: 21%, Inadequate: 79%	Adequate: 4%, Inadequate: 96%
Attendance of at least one training session	Yes: 39%, No: 61%	Yes: 3%, No: 97%
Ownership of business	Yes: 80%, No: 20%	Yes: 30%, No: 70%
Duration of business operation	6 years or more: 62%, Less than 6 years: 38%	6 years or more: 13%, Less than 6 years: 87%
Use of social media	Yes: 68%,No: 32%	Yes: 24%, No: 76%
Awareness about equity crowdfunding methods	Yes: 41%, No: 59%	Yes: 12%, No: 88%
Ability to order merchandise in bulk on credit from wholesalers	Adequate: 69%, Inadequate: 31%	Adequate: 16%, Inadequate: 84%
Bookkeeping skills	Adequate: 63%, Inadequate: 37%	Adequate: 21%,Inadequate: 79%
Highest level of academic qualification of owner	Degree or above: 62%, Diploma or less: 38%	Degree or above: 21%, Diploma or less: 79%
At least one success in securing a business loan in the past	Yes: 66%, No: 34%	Yes: 18%, No: 82%
Past history of at least one bankruptcy	Yes: 7%, No: 93%	Yes: 69%, No: 31%

#### Discussion of results

The principal aim of the research work in this paper was to construct a composite index that could be used for the measurement of basic entrepreneurial competence in emerging enterprises operating in South African townships in Gauteng Province, South Africa. The research was based on a sample of 432 small, micro and medium-sized enterprises (SMMEs) that operate in Gauteng Province. In each business enterprise, entrepreneurial competence was measured by using a composite index consisting of 5 dimensions. These 5 dimensions are talent for creativity (measured by using 3 items), willingness to take reasonable risk (measured by using 12 items), efficiency in responding to business opportunities (measured by using 15 items), business leadership quality (measured by using 18 items), and efficiency in taking advantage of programmes of assistance that are offered to emerging SMMEs by the South African Government (measured by using 11 items). The results showed that about 70% of participants had satisfactory entrepreneurial skills, whereas the remaining 30% of participants did not. Regression coefficients and goodness-of-fit statistics obtained from structural equations modelling showed that the level of entrepreneurial skills was significantly influenced by 3 factors. These 3 factors were ownership of business, long duration of business operation (6 years or longer) and the ability to use business intelligence methods to gather information about business decisions and activities carried out by rivals and competitors.

According to a ranking published by CEOWORLD (2021), the top 5 most entrepreneurial countries and their standardised scores in entrepreneurship are the USA (42.88), Germany (41.05), the United Kingdom (35.8), Israel (34.25) and United Arab Emirates (31.01). Since the early 1950s, Israeli businesses have excelled in the effective utilisation of the latest scientific discovery for minimising the cost of service delivery, goods and products without lowering quality standards. In this regard, the most notable examples come from economic sectors such as water, agriculture, information communication technology and industrial manufacturing. Israel-Fishelson and Hershkovitz (2021, p.3) have shown that exposing pupils to creative thinking, innovation and numeracy skills at an early stage is highly beneficial for fostering entrepreneurial thinking among the youth. Entrepreneurs identify a gap, and find solutions for filling the gap by using methods that are relatively more efficient and less costly in comparison with traditional and conventional methods. Fatoki (2014), Marivate (2014), Herrington (2018), Nthite and Worku (2019) and Ntshani (2020) have shown that programmes of assistance that are given to emerging SMMEs by the South African National Department of Trade, Industry and Competition (2023) and the Small Enterprise Development Agency (SEDA, 2020) are not utilised optimally due to obstacles such as poor awareness, inadequate motivation and commitment from owners and operators of start-up business enterprises. In the period since April 1994, successive South African Governments have provided administrative, financial, legislative and policy-related support to emerging SMMEs that are based on the National Small Business Act (Act no. 102 of 1996). However, extensive research work carried out by Marivate (2014), Herrington (2018), Worku (2018), Chigbu and Nekhwevha (2021), Dawson (2021), Gwiriri, Bennett, Mapiye and Burbi (2019) and Bahoo, Alon and Paltrinieri (2020) and Khambule (2021) have shown that it has not been possible to reduce the high rate of failure in emerging SMMEs due to lack of entrepreneurial skills. Dahlander, Gann and Wallin (2021), Dawson (2021) and De Crescenzo, Ribeiro-Soriano and Covin (2020) have identified additional obstacles such as lack of marketing and networking skills, intense competition from well-established businesses and difficulty in raising business loans.

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