AN INDEX METHOD FOR MEASUREMENT OF KNOWLEDGE AWARENESS OF CONSTRUCTION INDUSTRY OUTPUTS: GENDER PERCEPTIONS

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ABSTRACT

This study sought to investigative the knowledge of high school students on what constitutes as the products of the construction industry and whether gender has an influence on the knowledge awareness. The research uses a postal survey questionnaire for primary data collection. Literature review is used to identify the products (outputs) of the construction industry, which are then incorporated into the design of the survey instrument. The questionnaire is administered via a postal survey and information was collected from 599 male and 491 female high school students in the Western Cape Province. Survey response data is subjected to descriptive statistics and subsequently parametric tests and analysis of variance (ANOVA). Of the 18 construction industry outputs**,** students rated houses, schools, hotels, factories and airports as the predominant features of construction industry whereas taxi ranks, dams, oil refineries and night clubs (discos) were less likely to be linked to the construction industry. The findings further suggest that there are significant differences between male and female high school students on what constitutes as construction outputs with males demonstrating a higher knowledge awareness level than the females. The research limitation of the cross-sectional data made it difficult to generalise the findings. In terms of originality, the paper identifies the student's knowledge base of the construction industry outputs. The findings indicate that those structures such as school, hotels and factories that involve stakeholders other than typical building contractors were more likely to be linked to the construction industry than the dams, oil refineries and harbours. These installations by their nature are typically large and complex and seen less frequently being erected. The study makes a significant contribution as there are few studies which try to investigate the construction industry outputs knowledge awareness of high school students in an African environment. This study contributes to bridging that gap.

Keywords: Construction Outputs, gender differences, knowledge, South Africa

INTRODUCTION

The aim of this paper is to investigate the knowledge awareness of high school students on what constitutes as construction products. Prior to that the paper discusses the approach undertaken in the development of an index method for the measurement

of construction knowledge awareness. The paper questions whether gender is linked to the awareness levels and suggests a methodology for the measurement of the same. Some literature on existing knowledge awareness instruments and gender impact is presented followed by the research methodology.

LITERATURE REVIEW

Knowledge Awareness Instruments

While there is ample of literature on knowledge management, instruments designed to capture knowledge and children's knowledge and awareness of environmental education, no empirical study has been reported on the impact of gender on the knowledge awareness levels of the construction industry outputs. More so, despite the proliferation of knowledge measurement instruments, there is a lack of specific instruments designed to capture the knowledge levels of high school students within the African context. Hari et al (2005) developed a knowledge capture awareness tool. They conducted a survey on small and medium enterprises within the UK Construction Industry. The authors did not test the applicability of this instrument within the African context nor was the impact of gender on the knowledge awareness ever tested.

Lang (2001) studied the managerial concerns in knowledge management. However this work was more of a discourse of how knowledge is socially constructed and focussed mostly on the IT industry. Strong (1998) investigated the impact of environmental education on children's knowledge and awareness of environmental concerns, however this study was within the education discipline and more so, the sample consisted children as opposed to high school students. Within the USA context, Hausbeck et al (1992) examined the environmental knowledge, awareness and concerns among 11thgrade students and found that although students displayed higher scores on awareness and concerns, they had little knowledge of environmental issues. However although the authors did control for the sex of students, the focus of the study was again within the Environmental awareness discipline and the findings could be generalisable or applicable within the specific African context.

Gender Differences

Summary of the Literature Review

The above discussion of the literature reveals that existing knowledge management studies within the construction context are from the western environment and conducted among the parties within the construction process, within the exception of the Strong (1998) study which was environmental discipline related and children as the unit of analysis. It also shows that no empirical studies have been conducted on the knowledge awareness instruments which try to investigate the construction industry outputs knowledge awareness of high school students in an African environment. This paper investigates the impact of gender of the knowledge awareness levels of what constitutes as construction outputs and propose the development of such a tool using the index approach to achieve the objectives.

RESEARCH METHODOLOGY

The methodological framework

The aim of this exploratory study is to investigate the existing levels of knowledge awareness of high school students on what constitutes as construction products. The

study further aims to explore whether gender does have an impact on these awareness levels and how significant these differences are. The premise of this paper is more on the development a measurement instrument thus termed **COINP**ro-**KIT** (Construction Industry Products – Knowledge Index Tool).

Instrument

A questionnaire survey was conducted in 2005. Survey targets were limited to high school students in the Western Cape. The final questionnaire comprised of nine parts. The first part examined background information about the respondents. The second part examined factors impacting on career decisions. The third part investigated student knowledge of the construction industry. Part four identified the construction disciplines and professions considered among the high school students. The activities included in the work of a construction manager were examined in Part five, whereas part six investigated the pre-requisite high school subjects for construction management degree enrolment.

Part seven explored the fields of employment for construction management graduates. Various levels of agreement on construction-related statements were sought in part eight. The 23 statements could be categorized into internal and external factors affecting the image of the construction industry. Finally, part nine investigates the categories of construction employment that school children should seek. This paper reports on the first and second parts of the survey instrument. The majority of the second part had questions confined to simple "yes", "no" and "unsure" considering the limited time available to interact with them.

Data Analysis

According to Forza (2002), Data analysis can be schematically divided into two phases: preliminary and hypothesis testing. Boyer et al (2002) described these phases as macro-level and micro-level analysis. This study adopted both approaches. The first level (macro) was concerned with the aggregate surface characteristics of the respondents using measures of the descriptive statistics such as the mean, standard deviation, and measures of central tendency. Whereas the second level (micro) analysis involved parametric tests such as Analysis of Variance (ANOVA), and separate independent t-test.

The primary focus of this study presented in this paper was to develop an index method for the measurement of knowledge awareness and to determine whether differences existed in the knowledge awareness levels of construction industry outputs between male and females high school students. *Statistical Package for Social Sciences* (SPSS) computer program was used to analyse the data generated by the research questions. ANOVA, and separate independent t-test were used for the analysis. The overall reliability of the 18 items making up the construction industry outputs was 0.919 for the males and 0.893 for the females. As observed by Wetzel, (2005), descriptive statistics are concerned with taking data and turning it into useful and consumable information. Forza (2002) opines that carrying out such preliminary data analysis before assessing the measurement of quality gives preliminary indication of how well the coding and entering of data have been, how good the scales are, and whether there is suspicion of poor content validity or systematic bias. To find out whether there was a significant difference between the groups (male and female high school students); the Levene's test also provided the solution in testing the equal

variance assumptions (Field, 2000). As asserted by Forza (2002), the function of t-tests is to see whether there is a significant difference in the means for two groups in the variable of interest. Zikmund (1994) also proposed t-test or Z-test as the common bi-variate test of difference among two independent groups for interval and ratio type of measurement. This test was therefore considered more appropriate considering that this research sought in addition to developing a total knowledge awareness index tool, to identify the differences between male and female high school students on issue pertaining to the predominant features of the construction industry to measure the impact of gender on the knowledge awareness levels, independent t-tests were conducted.

The Sample

A total of 1500 questionnaires were sent out to the high school students in three different grades; 10; 11 and 12. A total of 1121 questionnaires were returned. This provided an effective response rate of 75% which was considered very high despite the difficulties encountered in engaging the Grade 12's relative to participation in the study. The response rate was therefore deemed adequate for the purpose of data analysis. The breakdown of the respondents according to grade was as follows: 36.3% Grade 10, 51.4% Grade 11 and 12.3% Grade 12 high school students in the Western Cape. Males made up the larger proportion of the sample, namely 55.1%. The schools who participated in the survey were drawn from across the full socio-economic profile of the region being situated inter alia, in Khayelitsha, Guguletu, Kasselsvlei, Bellville, Mitchells Plain, and Pinelands. The majority (16.6%) of the respondents were from Tafelsig High school. The schools had an average number of 104 students.

DEVELOPMENT OF THE INDEX METHOD

In this section a discussion of the measurement instrument construction procedure, the characteristics of the sample and the methodology for data analysis is presented and discussed.

Development of the knowledge awareness index measurement instrument

The importance of developing validate measures are articulated by several researchers (Nunnally, 1978; Saraph et al, 1989; Madu, 1998). Several dimensions of validity need to be addressed such as content validity, construct validity and criterion-related validity (Flynn et al, 1994). In order to achieve that, they are various steps to be considered in the instrument development process. Much of the earlier works in quality management such as Saraph et al (1989) adopted a 9 step approach. The steps taken in the development and validation of the proposed knowledge awareness index are adopted from Sureshchandra et al (2002) seven step approach comprising the following:

Step 1	Expound the theory and concepts that underlie a particular management philosophy
Step 2	Design of survey instrument by careful selection of the representative items
Step 3	Pre-testing of the instrument
Step 4	Modifications, refinements and finalisation of the Instrument

Step 5 Data Collection
Step 6 Factor Analysis of Data
Step 7 Proposed Index Method for Knowledge Awareness Measurement

According to Sureshchandar et al (2002), a critical aspect in the evolution of fundamental theory is the development of good measures to obtain valid and reliable estimates of the construct of interest.

Step 1 which deals with expounding the theory and concepts that underlie a particular management theory involved the review of literature and the identification of existing job satisfaction measurement instruments. This formed part of the exploratory phase in phase of the research design. This issue have been presented in the earlier sub sections. **Step 2** involved the design of the survey instrument by careful selection of the representative items. **Step 3** dealt with the pre-testing of the instrument, either objectively or subjectively by experts in the field. According to Chileshe and Watson (2004), this is defined as content validity which forms part of the confirmatory factor analysis.

Step 4 is addressed by the modifications (if any) to the existing satisfaction measurement instrument found in literature such as the Knowledge Capture Awareness tool (Hari et al 2005), refinement and finalisation of the proposed index method for knowledge awareness instrument thus termed, COINPro-KIT (COnstruction Industry Products – Knowledge Index Tool) which is provided for in the subsection dealing with the review of literature and existing instruments. Finally but not the least, **Step 5** dealt with data collection through a self administered questionnaire to 1090 high school students within the Western Cape province in South Africa.

Step 6 contains the three-stage continuous improvement cycle which according to Chen and Paulraj (2004) lies at the heart of the instrument development process and addresses the issues of Confirmatory Factor Analysis. This is equivalent to scale evaluation process which entails items generation, scale re-development and scale evaluation. The following sub section describes the process undertaken to determine the requirements of the steps in the development process. Confirmatory factor analysis is run for all the constructs. Content validity at the item level measures the target or content domain which it is supposed to measure and as the instrument has been developed based on the knowledge capture awareness tool, therefore ensuring validity since the instrument has been previously tested in several studies ranging from manufacturing to services. The **reliability issues** are addressed through the following measures is used in this paper for the reliability tests namely; Cronbach Alpha; Kaiser-Meyer-Oklin (KMO) Sampling measure of adequacy; and Barletts Measure.

Computation of Total Knowledge Score (TKS) and Knowledge Index (KI)

Based on the mean scores of the respondents, the Total Knowledge Score (TKS) and the Knowledge Index (KI) was generated; this can be used by the Construction Industry and in identifying the levels of knowledge pertaining to the construction products of the high school students. The TKS was calculated using the following formula

$$TKS = [\sum Y - \sum N] = \quad (100 \leq TKS \leq -100) \ldots\ldots \textbf{Equation 1.0}$$

The KI was calculated using the following formula

$$KI = \frac{\sum TKS}{100} \quad (+1 \leq KI \leq -1) \ldots\ldots\ldots\ldots \textbf{Equation 2.0}$$

Where: TKS = Total Knowledge Score obtained from equation 1.0 which is the difference between the positive and negative responses. The value ranges from -1 to + 1 where a negative value was classified as inelastic knowledge and the positive value as elastic knowledge. In summation, if the number of positive respondents is more than the negative responses, the knowledge of the construction product would be deemed to be elastic and vice versa.

A low and negative knowledge index indicates that the construction product is least known by the South African high school students, whereas a high and positive index indicates that the product is generally known as an output of the construction industry. The TKS and Knowledge indices for the sample are shown in Table 2.0. Previous application of the indices can be found for Construction Managers (CM-RII) in Chileshe et al (2005a, b). Other studies have employed similar indices. For example Love et al (2001).

The Methodology for the Process Matrix

The main steps involved in the formulation of the Index Method of Knowledge Awareness of Construction Industry Outputs Matrix are summarised in three steps as follows:

Step 1- Data Matrix: Information for the raw data is through the descriptive statistics such as the frequency, means scores and standard deviation of the respondents on the 18 items describing the outputs of the industry. Knowledge awareness of the construction industry products for the full sample and also differentiated by gender. These are illustrated in Tables 1.0 and 3.0.

Step 2 and 3 - Process Matrix: The matrix is generated through the application of Equations 1 and 2 with the outputs being the "Total Knowledge Score" and "Knowledge Index". The results are shown in Tables 2 and 3 and illustrated in Figure 1.0.

APPLICATION OF THE INDEX METHOD

Student's Knowledge of Construction Products

In order to establish what students knew about construction they were asked 18 questions about what construction included. Their responses are shown ranked by the means of these responses in Table 2. To analyse the student's knowledge of the construction industry outputs and the importance attached by the respondents (high school students), the first step was to compare rankings and means of female and high school students for all the 18 construction industry outputs (products) included in the questionnaire. Results are shown in Tables 1 and 2. There were 8 statistically significant differences (Table 4) in the Knowledge awareness levels that females and

males placed on the particular construction outputs (products). To facilitate the understanding of these differences, the following section includes a discussion of the seven outputs perceived by male high school students to be the most important predominant features of the construction industry, followed by a discussion of the 1 output perceived by female's high school students to be more important.

Table 1: Descriptive Statistics for the Awareness of Construction Industry Outputs: Male and Females High School Students Views

Product/structure	**Males (N=591)**			**Females (N= 476)**		
	Mean	**Std. Dev**	**Rank**	**Mean**	**Std. Dev**	**Rank**
CO_1=Houses	1.4873	.5002	**1**	1.4769	.4999	**1**
CO_2=Schools	1.5448	.4984	**4**	1.4895	.5004	**2**
CO_3=Hotels	1.5195	.5000	**2**	1.5231	.4999	**3**
CO_4=Factories	1.5482	.4981	**5**	1.5735	.4951	**4**
CO_5=Airports	1.5482	.4981	**6**	1.6239	.4849	**7**
CO_6=Bridges	1.5415	.4987	**3**	1.6429	.4797	**8**
CO_7=Office Blocks	1.6108	.4879	**7**	1.5840	.4934	**5**
CO_8=Churches, Mosques and Temples	1.6210	.4855	**8**	1.6218	.4854	**6**
CO_9=Blocks of Flats	1.6261	.4843	**9**	1.666	.4722	**10**
CO_{10}=Shops	1.6413	.4800	**12**	1.6618	.4736	**9**
CO_{11}=Railway Stations	1.6328	.4824	**10**	1.6912	.4625	**11**
CO_{12}=Highways	1.6362	.4815	**11**	1.7395	.4394	**13**
CO_{13}=Terminuses and Bus Shelters	1.7276	.4456	**15**	1.7353	.4416	**12**
CO_{14}=Harbours	1.6988	.4592	**13**	1.7836	.4122	**14**
CO_{15}=Taxi Ranks	1.7496	.4336	**17**	1.7899	.4078	**15**
CO_{16}=Dams	1.7157	.4514	**14**	1.8613	.3460	**17**
CO_{17}=Oil Refineries	1.7428	.4375	**16**	1.8634	.3437	**18**
CO_{18}=Discos	1.7716	.4202	**18**	1.8466	.3607	**16**

Table 1.0 also sets out the mean score, standard deviations and rankings (R) of the 18 construction products of male and female high school students. As seen from the table, male respondents ranked "Houses", "Hotels", "Schools", and "Bridges" as the predominant features or outputs of the Construction Industry whereas the female counterparts ranked "Houses", "Schools", "Hotels" and "Factories". The least predominant features ranked 17^{th} and 18^{th} were "Taxi Ranks" and "Discos or Theatres/Night Clubs" respectively for Males whereas Females ranked "Dams" and "Oil Refineries".

There were some differences in the ranking at the bottom of the products. By far the biggest difference was in "Discos". Males considered discos or theatres least

important or predominant (eighteenth overall) whereas females considered it as sixteenth most predominant feature.

DISCUSSION OF THE FINDINGS

In Table 2, the frequency of the response, total knowledge score (TKS) and knowledge index (TK) of the 18 construction outputs is also presented for the full sample. As seen from the Table 2.0, the high school students ranked Houses and Schools as the predominate features of the Construction Industry whereas Oil Refineries and Discos or Theatres were the least ranked.

Table 2 Total Knowledge Score and Index for Construction Industry Outputs (Products) Awareness: Full Sample

Product/structure	**Yes (%)**	**No (%)**	**Mean[1]**	**Std. Dev.**	**Rank**	**TKS**	**KI**
CO_1=Houses	51.7	48.3	1.48	0.50	1	3.4	0.034
CO_2=Schools	48.0	52.0	1.52	0.50	2	-4.0	-0.040
CO_3=Hotels	47.9	52.1	1.52	0.50	3	-4.2	-0.042
CO_4=Factories	44.0	56.0	1.56	0.50	4	-12.0	-0.120
CO_5=Airports	41.8	58.2	1.58	0.49	5	-16.4	-0.164
CO_6=Bridges	41.3	58.7	1.59	0.49	6	-17.4	-0.174
CO_7=Office blocks	40.1	59.9	1.60	0.49	7	-19.8	-0.198
CO_8=Churches, Mosques and Temples	37.9	62.1	1.62	0.49	8	-24.2	-0.242
CO_9=Blocks of Flats	35.6	64.4	1.64	0.48	9	-28.8	-0.288
CO_{10}=Shops	35.0	65.0	1.65	0.48	10	-30.0	-0.300
CO_{11}=Railway Stations	34.1	65.9	1.66	0.47	11	-31.8	-0.318
CO_{12}=Highways	31.8	68.2	1.68	0.47	12	-36.4	-0.364
CO_{13}=Terminuses and Bus Shelters	26.9	73.1	1.73	0.44	13	-46.2	-0.462
CO_{14}=Harbours	26.3	73.7	1.74	0.45	14	-47.4	-0.474
CO_{15}=Taxi Ranks	23.2	76.8	1.77	0.42	15	-53.6	-0.536
CO_{16}=Dams	21.9	78.1	1.78	0.41	16	-56.2	-0.562
CO_{17}=Oil Refineries	20.3	79.7	1.80	0.40	17	-59.4	-0.594
CO_{18}=Discos	19.5	80.5	1.81	0.40	18	-61.0	-0.610

In Table 3, the total knowledge score (TKS) and knowledge index (TK) of the 18 construction outputs is also presented for the two groups: first males and then females. As seen from the Table 3.0, both male and female high school students ranked "Houses" as the most important predominant feature of the construction industry. "Taxi Ranks", "Discos or Theatres" and "Oil Refineries" and "Dams" were insignificant in this study for Male and Female high school students respectively.

[1] The smaller the mean the more students associated the product/structure with construction

Table 3: Comparison of Female and Males Total Knowledge Scores and Index for Construction Industry Outputs (Products) Awareness

Product/structure	Males			Females		
	TKS	**KI**	**Rank**	**TKS**	**KI**	**Rank**
CO_1=Houses	15.00	0.150	**1**	22.00	0.220	**1**
CO_2=Schools	-53.00	-0.530	**4**	10.00	0.100	**2**
CO_3=Hotels	-23.00	-0.230	**2**	-22.00	-0.220	**3**
CO_4=Factories	-57.00	-0.570	**5**	-70.00	-0.700	**4**
CO_5=Airports	-57.00	-0.570	**6**	-118.00	-1.180	**7**
CO_6=Bridges	-49.00	-0.490	**3**	-136.00	-1.360	**8**
CO_7=Office blocks	-131.00	-1.310	**7**	-80.00	-0.800	**5**
CO_8=Churches, Mosques and Temples	-143.00	-1.430	**8**	-116.00	-1.160	**6**
CO_9=Blocks of Flats	-149.00	-1.490	**9**	-158.00	-1.580	**10**
CO_{10}=Shops	-167.00	-1.670	**12**	-154.00	-1.540	**9**
CO_{11}=Railway Stations	-157.00	-1.570	**10**	-182.00	-1.820	**11**
CO_{12}=Highways	-161.00	-1.610	**11**	-228.00	-2.280	**13**
CO_{13}=Terminuses and Bus Shelters	-269.00	-2.690	**15**	-224.00	-2.240	**12**
CO_{14}=Harbours	-235.00	-2.350	**13**	-270.00	-2.700	**14**
CO_{15}=Taxi Ranks	-295.00	-2.950	**17**	-276.00	-2.760	**15**
CO_{16}=Dams	-255.00	-2.550	**14**	-344.00	-3.440	**17**
CO_{17}=Oil Refineries	-287.00	-2.870	**16**	-346.00	-3.460	**18**
CO_{18}=Discos	-321.00	-3.210	**18**	-330.00	-3.300	**16**

COMMUNICATING THE KNOWLEDGE INDEX

Figure 1 illustrates the absolute values of total knowledge scores and indices of the 18 construction industry products for the full sample. The values obtained from Equations 1 and 2 and tabulated in Table 2 are used to prepare this figure.

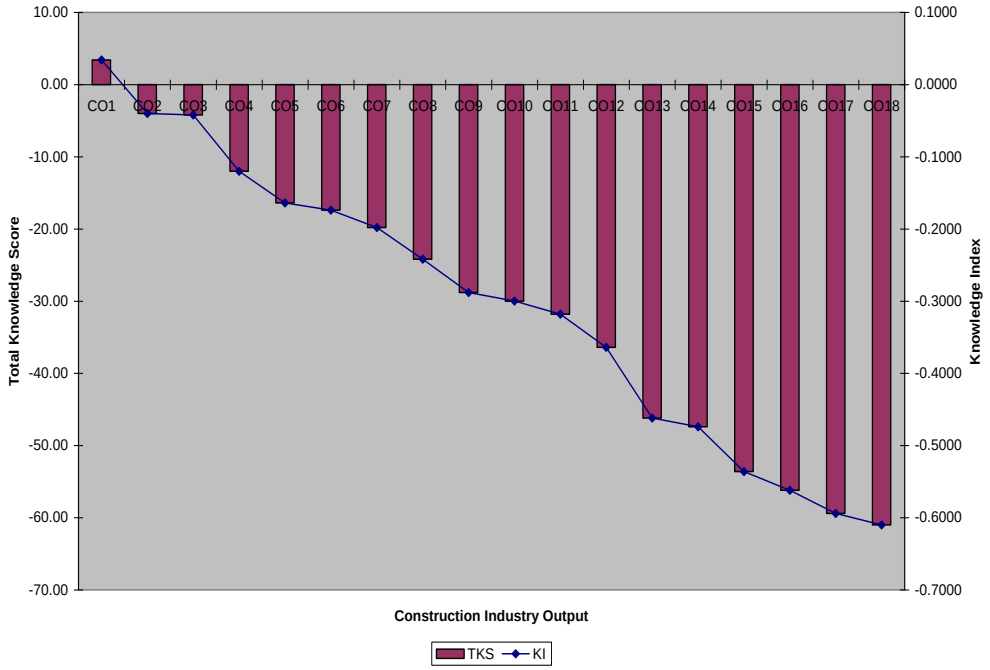

Figure 1.0: Total Knowledge Score and Indices of Construction Outputs for Full Sample

Examination of Figure 1 and Table 3 indicates that "Houses" achieved the positive (yes scores greater than no scores and thus elasticity) highest levels of total knowledge scores and indices (TKS = 3.4) and a corresponding index value of 0.0340. This is also supported by the results of the independent sample t-test results in Table 4 which shows that the differences between males and female high school students were not significant ($p>0.05$). This finding is important as it validates Equations 1 and 2 as computed and used in this paper.

An independent samples t-test was conducted to compare the importance of the construction industry output scores for male and female high school students. The results are shown in Table 4.0. Separate independent t-test was carried out in order to find whether there was a significant difference between the two groups (males and females) in the scores for the knowledge awareness of construction industry products, the value of the Sig. (2 tailed) from the SPSS output provided the solution where Sig. (2-tailed) is equal or less than 0.05 indicated a significant difference in the mean scores and for the value above 0.05, meant that there was no significant difference between the two groups. Examination of Table 4.0 indicates that there was no significant in scores for male and females high school students for the majority (10) of the construction outputs items. However male high school students placed higher knowledge awareness on seven of the 8 construction industry outputs. Several construction outputs related to infrastructure were perceived to be the predominant features or outputs of the construction industry from the male high school students than the female counterparts.

The construction output's rank and mean for these perceived differences are shown in parentheses for each group. For example, male high students (rank = **6**, mean =1.5482) placed a higher knowledge awareness of *airports* vs. female high school students (rank = **7**, mean = 1.6239); *bridges* (**3**, 1.5214) vs. (**8**, 1.6429); *railway*

Stations (**10**, 1.6328) vs. (**11**, 1.6912); *highways* (11, 1.6362) vs. (13, 1.7395); *harbours* (13, 1.6988) vs. (14, 1.7836); *dams* (14, 1.7157) vs. (17, 1.8613); and *oil refineries* (16, 1.7428) vs. (18, 1.8634). On the other hand, female high students only reported significant higher scores on one construction product, namely *Disco's* (**16**, 1.88466) vs. (**18**, 1.7716).

Table 4: Results of t-test comparing the construction industry outputs knowledge awareness scores of female and male high school students

Product/structure	**t-test for equality of means**				**Significant Difference[1]**
	t	**df**	**Sig. (2-tailed)**	**Mean Difference**	
CO_1=Houses	.338	1065	.735	.01042	No
CO_2=Schools	1.800	1065	.072	.05534	No
CO_3=Hotels	-.119	1065	.906	-.00365	No
CO_4=Factories	-.827	1065	.408	-.02048	No
CO_5=Airports	-2.505	1027.79	.012	-.0757	Yes
CO_6=Bridges	-3.372	1032.23	.001	-.1014	Yes
CO_7=Office blocks	.887	1065	.375	.0268	No
CO_8=Churches, Mosques and Temples	-.029	1065	.977	-.00087	No
CO_9=Blocks of Flats	-1.357	1027.2	.175	-.03991	No
CO_{10}=Shops	-.697	1065	.486	-.02048	No
CO_{11}=Railway Stations	-2.009	1033.4	.045	-.05835	Yes
CO_{12}=Highways	-3.657	1048.52	.000	-.1033	Yes
CO_{13}=Terminuses and Bus Shelters	-.282	1065	.778	-.00771	No
CO_{14}=Harbours	-3.174	1052.51	.002	-.0848	Yes
CO_{15}=Taxi Ranks	-1.561	1039.81	.119	-.0403	No
CO_{16}=Dams	-5.963	1062.45	.000	-.14561	Yes
CO_{17}=Oil Refineries	-5.044	1064.3	.000	-.12064	Yes
CO_{18}=Discos	-3.138	1061	.002	-.0751	Yes

[1]**Note**: If the value in the Sig. (2-tailed) column is equal or less than .05 (e.g. .03), then there is a significant difference in the mean scores on the dependent variable for each of the two groups.

CONCLUSIONS

This study investigates the impact of gender on the knowledge of high school students on what constitutes as the products of the construction industry. An index method for capturing the awareness levels was proposed and developed in this study. This was found to be both reliable and valid. The added advantage of the index method is its notable strength; simple, generic, robust and logical. An independent sample t-test revealed that there were significant differences in opinion about what the predominant features or construction industry products were (Table 5). The findings indicate that

those structures such as school, hotels and factories that involve stakeholders other than typical building contractors were more likely to be linked to the construction industry than the dams, oil refineries and harbours. These installations by their nature are typically large and complex and seen less frequently being erected. The study makes a significant contribution as there are few studies which try to investigate the construction industry outputs knowledge awareness of high school students in an African environment. This study contributes to bridging that gap.

Limitations

Even though the rigorous validation procedure allowed the development of an index method for measuring the knowledge awareness of construction industry outputs, this research has some limitations that need to be acknowledged. Although the sample is relatively large (1090), comparable to others studies that have looked at the knowledge awareness instruments, it was only conducted among high school students within the Western Cape province of South Africa, as such it is not representative and the findings presented are not generaliseable to a wider population of high school students within the South African primary and secondary schools. However the findings represent a snapshot of the reality of the perceptions of high school students relative to the predominant features and importance of construction industry outputs. Furthermore as demonstrated by Chileshe (2004), the use of quantitative approaches normally require a large number of cases representing the population of interest, in order to determine the statistical significance of results.

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