Chapter 9: A survey on the acceptability and utilization of SAWiC by construction entrepreneurs

9.1 Introduction

The Women in Construction (WiC) initiative was originally founded in 1997. WiC later developed into the South African Women in Construction Association (SAWiC) with some of its objectives to assist women in protecting themselves against discrimination, to access contracts, create jobs, grow their businesses, enhance their entrepreneurial qualities and thus to survive and thrive in the construction industry dominated by males during the previous century. Because the aim of SAWiC is also to provide networking and training opportunities, the utilization of these two aspects will be analysed.

Where Chapter 8 analysed the acceptability element of the outcomes construct, Chapter 9 will add the utilization element to the constructs. Due to the low frequency of utilization of women construction entrepreneurs the utilization element could not be tested in Chapter 8, but because SAWiC as an association is operational for three years, both the acceptability and utilization elements of the outcomes construct are tested. The utilization element will only test the networking and training aspects. (Please refer to the schematic framework presented in Chapter 1).

To follow on Chapter 8 the aim of Chapter 9 is:

- To apply the Logical thinking approach of evaluation, specifically the acceptability and utilization elements, to women construction entrepreneurs by
- Doing an opinion survey of the acceptability and utilization of the South African Women in Construction Association (SAWiC) amongst 341 construction entrepreneurs.
- To develop an instrument to measure the above based on the evaluation constructs developed from the literature.

9.2 Research design and methodology for this chapter

9.2.1 Statistical methodology

As part of the SAWiC Research Program a questionnaire was designed and circulated amongst delegates at SAWiC meetings held in all nine provinces during May to September 2002. Six versions of the questionnaire were developed and pilot tested before the final one was used. After the questionnaire was filled out a short

interview was held with each respondent. This provided some qualitative information and ensured that all the questions were answered. No follow up was possible because unlike the questionnaire used in Chapter 8 the questionnaire used in Chapter 9 was filled out anonymously. Similar to Chapter 8 it is classified as a designated study of SAWiC delegate universum. It can also be regarded as a sample (although not a random sample) of the construction sector. As this is not a random sample survey, the sampling tests were therefore not done.

9.2.2 Managerial question

The managerial question is: Do the construction entrepreneurs accept and utilize the South African Women in Construction Association (SAWiC)? (Please refer to Section 9.5 for the Hypotheses derived from this question).

9.2.3 Respondents targeted

The questionnaire was directed to the delegates who attended the meetings of SAWiC in the provinces and the annual general meeting on 9 May 2002 in Midrand where the first round of 135 delegates filled out the questionnaires. In total 341 delegates at SAWiC meetings in all nine provinces filled out a questionnaire during May to September 2002. Of the 341 delegates nearly 70% were contractors, and 30% were already members of SAWiC while those who were not yet members, 98% of the delegates indicated that they would like to become members of SAWiC. Some 45% were already members of other professional work-related organisations.

Of the 343 only 2 questionnaires were rejected during the interviews as it was found that the respondents could not read and was prompted by fellow contractors. A total of 341 responses were thus used. The high percentage is due to the fact that each questionnaire was checked when handed in before the respondent left. Except for the Northern Cape, more than 30 questionnaires were received back per province. The 341 respondents who gave their opinions can be divided into Male 28 and Female 313. (n_T = 341; n_M = 28; n_F = 313). Of the 341 delegates only 8% were men.

9.2.4 Development of questions in questionnaire

An instrument called 'SAWiC Research Program on conducting a brighter future' was developed, filled out and followed by a brief interview of each delegate. The questionnaire for the programme consists of 9 sections. Sections B (Acceptability of SAWiC) and C (Utilization of SAWiC) were designed as instruments for Chapter 9.

9.3 Statistical tools used for the confirmation of validity and reliability

9.3.1 Cronbach Alpha analysis on deleted results of each question

A Cronbach Alpha value of above 0.5 is regarded as an indication of reliability. From the 21 questions the 3 constructs in Table 9.1 were derived to measure the construction entrepreneurs' acceptance and utilization of SAWiC. As in Chapter 8, should one question be deleted from the group, the Cronbach Alpha values in Table 9.1 present the value that the rest of the questions in the group will accept.

Table 9.1 Questions from which the Constructs were developed and Cronbach Alpha deleted results of the individual questions

Construct A:	**Acceptability of SAWiC**	
A1.	SAWiC is fulfilling an important role to empower women	0.58
A2.	SAWiC meetings are important for women in construction	0.53
A3.	SAWiC should have more contact sessions during the year	0.56
A4.	The SAWiC Secretariat and office should be expanded	0.53
A5.	SAWiC should be more active in all the provinces	0.57
Construct T:	**Utilization of Training opportunities through SAWiC**	
T1.	SAWiC should have more contact sessions during the year.	0.69
T2.	Training helped: to become aware of business opportunities & contracts through presentations and documents being distributed.	0.63
T3.	With topics discussed and training that could help you to take up business opportunities.	0.64
T4.	To improve your access to finance for contracts and business opportunities.	0.65
T5.	To get insight into and to solve problems relating to discrimination against women.	0.64
T6.	To get insight into and to solve problems relating to technical matters in construction.	0.65
Construct N:	**Utilization of Network opportunities through SAWiC**	
N1.	SAWiC should have more contact sessions during the year.	0.79
N2.	The SAWiC Secretariat and office should be expanded.	0.76
N3.	SAWiC should be more active in all the provinces.	0.77
N4.	Networking helped: to gain self-confidence for taking up the challenges of the construction industry.	0.77
N5.	To meet other people in the construction sector that might have similar problems than yours.	0.76
N6	To obtain contacts with suppliers that can open business opportunities.	0.77
N7.	To strengthen networks that can empower women for taking up new business opportunities.	0.76
N8.	To report discrimination to Government and the Construction Industry Development Board (CIDB).	0.77
N9.	To make contact with international experts in construction	

	through the affiliation with NAWIC (USA & Canada).	0.75
N10.	To make women entrepreneurs aware of HIV AIDS in the construction sector.	0.77

9.3.2 Cronbach Alpha analysis of the constructs

The Cronbach Alpha results of all the constructs are again far above the 0.5 level that is required for reliability and validity. The Cronbach Alpha results of each group of questions are in some cases higher than the individual deleted values of Table 9.1, which means that all the questions within each group are valid and reliable and is forming valid and reliable constructs. The constructs are thus measuring what they are supposing to measure, indicating a good and reliable instrument.

Table 9.2 Cronbach Alpha results of the constructs

CA	Construct A:	Acceptability of SAWiC	0.61
CT	Construct T:	Utilization of Training opportunities through SAWiC	0.69
CN	Construct N:	Utilization of Network opportunities through SAWiC	0.79

9.3.3. Factor analysis on the constructs

As mentioned in Chapter 8, factor analysis looks for patterns among the variables to discover if an underlying combination of the original variables (a factor) can summarise the original set. Factor analysis also attempts to reduce the number of variables and discover the underlying constructs that explain the variance (Cooper & Schindler 2001:214, 574, 575, 591 and 604).

In order to confirm the validity of the grouping of the questions a factor-analysis was done of the instrument:

Table 9.3 Factor analysis of the constructs

Con-stuct No	Constructs developed from the 21 questions	Mineigen Criterion: Factors Reported:	Variance explained by factor	Commu-nalities differ from:	Commu-nalities differ to: (highest)
C A	Acceptability of SAWiC	1	2.00	0.35	0.48
C T	Utilization of Training opportunities through SAWiC	1	2.45	0.28	0.49
C N	Utilization of Network opportunities through SAWiC	2	3.52 1.20	0.39	0.62

Although the 'Mineigen Criterion of Factors Reported' derived two factors in CN from the 10 Questions asked for this construct, it will be analysed as one construct.

9.4 Statistical tools applied in analysing the responses

9.4.1 Computer programme

As in Chapter 8 the data was analysed by using SAS computer programme (SAS 1988).

9.4.2 Means and standard deviations

Arithmetic means ($\bar{X}$) and standard deviations (S) are reported in this research.

9.4.3 T-tests

T-tests were used to determine the significance of the difference between the averages of the answers given by respondents about SAWiC in 2x2 matrixes.

9.4.4 Probability Values (*p* values) measuring statistical significance

Results will be regarded as significant if the p-values are smaller than 0.05, because this value presents 95% degrees of freedom on the normal distribution curve.

9.4.5 Cohen-d values measuring practical significance

The practical significance of the results (d-values) will be computed when the p-value was statistically significant ($p \leq 0.05$). According to Steyn (1998:13), Cohen (1977) recommends the following guidelines for practical significance:

d = 0.2 smaller effect;

d = 0.5 medium effect;

d = 0.8 large effect (Steyn, 1998:13):

$$\text{Cohen d} = \frac{\mu_1 - \mu_2}{\sigma} \text{ or } = \frac{\bar{X}_1 - \bar{X}_2}{S} \qquad \text{(Cohen 1988)}$$

9.4.6 ANOVA (Analysis of variance)

The statistical method for testing the null hypothesis, for matrixes larger than 2x2, is analysis of variance (ANOVA). The provinces will be regarded as the independent variable for the analysis of variance. The *F* distribution determines the size of ratio necessary to reject the null hypothesis for a particular sample size and level of significance (Cooper & Schindler, 2001:509). SAS works out a P-value that replaces the use of the *F* statistical tables.

P-values ≤ 0.05 indicate statistical significance.

9.5 Hypotheses

In each case the alternative hypotheses H_a will be the negative or opposite of the null hypotheses H_0.

9.5.1 Construct A: Acceptability of SAWiC

H_0A1: There is a significant positive acceptance of SAWiC by construction entrepreneurs.

H_0A2: There is a significant difference between male and female construction entrepreneurs in the acceptance of SAWiC.

H_0A3: There is a significant difference between construction entrepreneurs in the nine provinces regarding the acceptance of SAWiC.

9.5.2 Construct T: Utilization of training opportunities through SAWiC

H_0T1: There is a significant positive attitude towards the utilization of SAWiC's training opportunities by construction entrepreneurs.

H_0T2: There is a significant difference between male and female construction entrepreneurs in the utilization of SAWiC's training opportunities.

H_0T3: There is a significant difference between construction entrepreneurs in the nine provinces regarding the utilization of SAWiC's training opportunities.

9.5.3 Construct N. Utilization of network opportunities through SAWiC

H_0N1: There is a significant positive attitude towards the utilization of SAWiC's network opportunities by construction entrepreneurs.

H_0N2: There is a significant difference between male and female construction entrepreneurs in the utilization of SAWiC's network opportunities.

H_0N3: There is a significant difference between construction entrepreneurs in the nine provinces regarding the utilization of SAWiC's network opportunities.

Table 9.4 Summary of hypotheses

H_0	Construct: / Statement:	acceptability. (A)	training. (T)	networking. (N)
1	There is a significant positive attitude towards SAWiC regarding…	H_0A1	H_0T1	H_0N1
2	There is a significant difference per gender regarding SAWiC's…	H_0A2	H_0T2	H_0N2
3	There is a significant difference per province regarding SAWiC's…	H_0A3	H_0T3	H_0N3

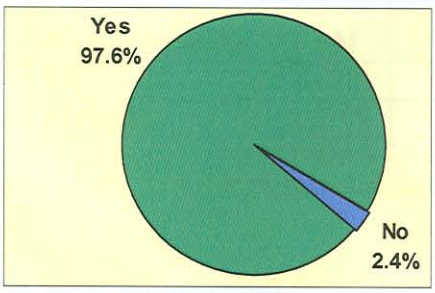
Similar to Chapter 8 the hypotheses will be summarised by using Table 9.4 above.

9.6. Statistical analysis of the constructs

9.6.1 Construct A: Acceptability of SAWiC

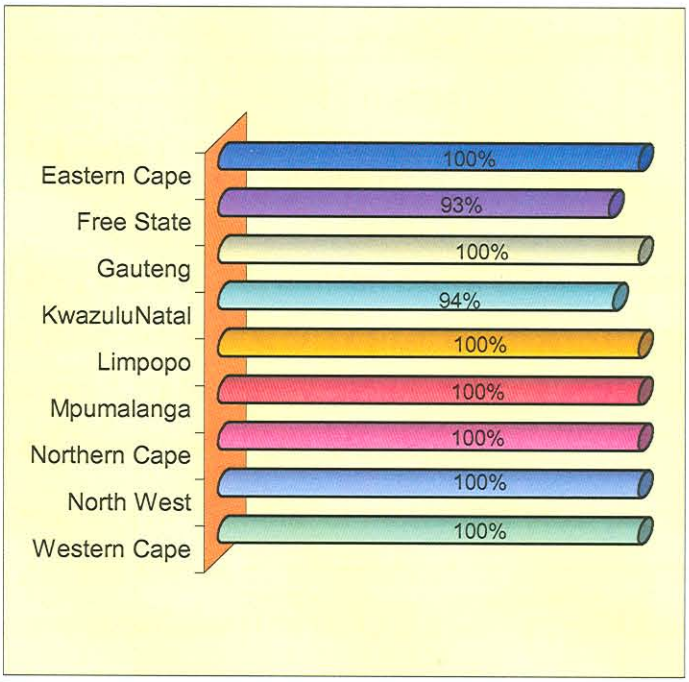
To obtain the attention of the respondents, three dichotomous (Yes or No) questions were asked: 1. If not yet, would you like to become a member of SAWiC?

Figure 9.1: Membership acceptability



Overwhelmingly 97.6% non-members of SAWiC indicated that they would like to become members. Only Free State and Kwazulu-Natal were less than 100% due to branches erected.

Figure 9.2: Membership acceptability per province



On both the remaining questions the response was also Yes: 2. Would you like to have your name on a detailed SAWiC database for distribution to clients nationally and internationally? 3. Would you like to receive a SAWiC annual report?

Figure 9.3: Database acceptability

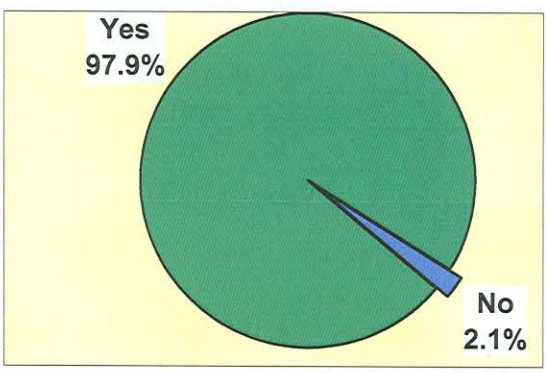
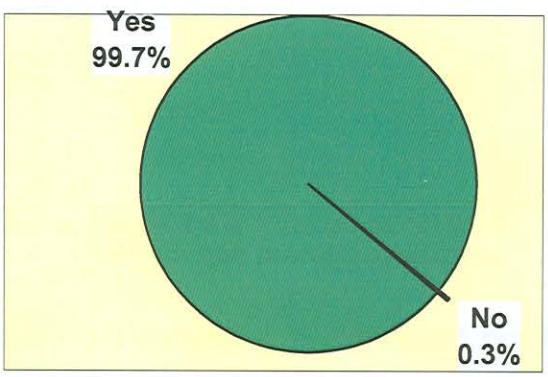


Figure 9.4: Annual report acceptability



Separate provincial analysis will not be done as there is no significant variance between them. A general positive attitude was apparent from all the delegates.

Apart from the above dichotomous questions, five statements were made, scaled on the Likert scale, with 1=disagree strongly; 2=disagree; 3=agree and 4=agree strongly.

The following five statements were formulated in designing Construct A:

A1. SAWiC is fulfilling an important role to empower women
A2. SAWiC meetings are important for women in construction
A3. SAWiC should have more contact sessions during the year
A4. The SAWiC Secretariat and office should be expanded
A5. SAWiC should be more active in all the provinces.

Table 9.5: T-test for Construct A: Acceptability of SAWiC per gender

Respondents	N	$\overline{X}$	S	P-value	Cohen-d
Male	28	3.69	0.246	0.8038	-
Female	311	3.70	0.356		

A mean above 2.5 is regarded as good and below 2.5 is regarded as not good.
* indicates statistical significance, +++ indicates practical significance.

As the middle-value of a four-point Likert scale is 2.5, a mean above 2.5 is regarded as good and below 2.5 is regarded as not good, for the purpose of this study. The two means of 3.69 for male respondents and 3.70 for female respondents are regarded as extremely good. Given the above the Hypothesis H_0A1 is accepted.

Although the mean of females is slightly higher than that of males, the t-test pointed out no significant statistical difference and Cohen-d, no practical difference in the acceptability of SAWiC between males and females. The H_0A2 is therefore rejected.

Table 9.6: ANOVA for Construct A: Acceptability of SAWiC per province

	Province	N	$\overline{X}$	S	P	Tukey	d
1.	Eastern Cape	25	3.68	0.38	0.0033 *	2 & 3	0.72
2.	Free State	65	3.82	0.26			
3.	Gauteng	57	3.58	0.41			
4.	Kwazulu-Natal	33	3.75	0.33			
5.	Limpopo	33	3.70	0.32			
6.	Mpumalanga	51	3.74	0.30			
7.	Northern Cape	12	3.50	0.41			
8.	North West	33	3.61	0.44			
9.	Western Cape	30	3.72	0.24			

A mean above 2.5 is regarded as good and below 2.5 is regarded as not good.
* indicates statistical significance, +++ indicates practical significance.

The means of all the provinces are far above 2.5 indicating a significant positive attitude towards SAWiC in all provinces. There is however a significant statistical difference with only a medium practical effect between the provinces. The Tukey studentized range indicates comparisons as significant at 0.0033 Tukey spotted the largest difference between Free State and Gauteng. The H_0A3 is therefore accepted.

9.6.2 Construct T: Utilization of training opportunities through SAWiC

The following six statements were formulated to design this construct:

T1. SAWiC should have more contact sessions during the year.
T2. Training helped: to become aware of business opportunities & contracts through presentations and documents being distributed.
T3. With topics discussed and training that could help you to take up business opportunities.
T4. To improve your access to finance for contracts and business opportunities.
T5. To get insight into and to solve problems relating to discrimination against women.
T6. To get insight into and to solve problems relating to technical matters in construction.

Table 9.7: T-test for Construct T: Utilization of training opportunities through SAWiC per gender

Respondents	N	$\bar{X}$	S	P-value	Cohen-d
Male	28	3.67	0.340	0.3299	-
Female	311	3.74	0.316		

A mean above 2.5 is regarded as good and below 2.5 is regarded as not good.
* indicates statistical significance, +++ indicates practical significance.

The means for the female respondents is a high 3.74 with the male respondents presented also a high 3.67. The P-value indicated no significant statistical difference between male and female respondents regarding the utilization of SAWiC's training opportunities. Therefore H_0T1 is accepted and H_0T2 rejected.

Table 9.8: ANOVA for Construct T: Utilization of training opportunities through SAWiC per province

	Province	N	$\bar{X}$	S	P	Tukey	d
1.	Eastern Cape	25	3.76	0.28	0.1153	-	-
2.	Free State	65	3.79	0.26			
3.	Gauteng	57	3.71	0.33			
4.	Kwazulu-Natal	33	3.78	0.32			
5.	Limpopo	33	3.72	0.42			
6.	Mpumalanga	51	3.79	0.26			
7.	Northern Cape	12	3.60	0.34			
8.	North West	33	3.63	0.38			
9.	Western Cape	30	3.67	0.29			

A mean above 2.5 is regarded as good and below 2.5 is regarded as not good.
* indicates statistical significance, +++ indicates practical significance.

The analysis of variance could not detect any significant statistical difference between the provinces regarding Construct T: Utilization of training opportunities. Therefore H_0T3 is rejected. All the averages are above 3.6 and far above the 2.5 level. All provinces thus have extremely positive attitudes towards SAWiC's training.

9.6.3 Construct N: Utilization of network opportunities through SAWiC

The following ten statements were formulated to design this construct:

N1. SAWiC should have more contact sessions during the year.
N2. The SAWiC Secretariat and office should be expanded.
N3. SAWiC should be more active in all the provinces.
N4. Networking helped: to gain self-confidence for taking up the challenges of the construction industry.
N5. To meet other people in the construction sector that might have similar problems than yours.
N6 To obtain contacts with suppliers that can open business opportunities.
N7. To strengthen networks that can empower women for taking up new business opportunities.
N8. To report discrimination to Government and the Construction Industry Development Board (CIDB).
N9. To make contact with international experts in construction through the affiliation with NAWIC (USA & Canada).
N10. To make women entrepreneurs aware of HIV AIDS in the construction sector.

Table 9.9: T-test for Construct N: Utilization of network opportunities through SAWiC per gender

Respondents	N	$\bar{X}$	S	P-value	Cohen-d
Male	28	3.73	0.276	0.8897	-
Female	311	3.74	0.307		

A mean above 2.5 is regarded as good and below 2.5 is regarded as not good.
* indicates statistical significance, +++ indicates practical significance.

Even though the mean of females is slightly higher than that of males, the t-test pointed out no significant statistical difference and Cohen-d, no practical difference in the attitude between males and females of SAWiC's network opportunities. The H_0N2 is therefore rejected, but given the high means H_0N1 is accepted.

Table 9.10: ANOVA for Construct N: Utilization of network opportunities through SAWiC per province

	Province	N	$\bar{X}$	S	P	Tukey	d
1.	Eastern Cape	25	3.74	0.30	0.1386	-	-
2.	Free State	65	3.79	0.28			
3.	Gauteng	57	3.72	0.33			
4.	Kwazulu-Natal	33	3.77	0.31			
5.	Limpopo	33	3.74	0.29			
6.	Mpumalanga	51	3.79	0.27			
7.	Northern Cape	12	3.53	0.37			
8.	North West	33	3.65	0.38			
9.	Western Cape	30	3.71	0.24			

A mean above 2.5 is regarded as good and below 2.5 is regarded as not good.
* indicates statistical significance, +++ indicates practical significance.

The ANOVA could not detect any significant statistical difference between the provinces regarding Construct N: Utilization of network opportunities through SAWiC. It should be pointed out that the Northern Cape has the lowest mean and do not feel as strongly about this construct as the other provinces. The ANOVA however indicated that these differences are of no statistical significance. The hypothesis H_0N3 is therefore rejected.

9.7 Findings

Given the results of the Cronbach Alpha and Factor analysis, the instrument developed to apply the logical thinking approach especially for measuring the acceptability and utilization elements of the Outcomes construct, proved to be reliable and valid. This instrument could be used for similar studies in future.

Table 9.11 Summary of hypotheses results and findings

H_0	Construct: Statement:	acceptability. (A)	training. (T)	networking. (N)
1	There is a significant positive attitude towards SAWiC regarding…	H_0A1 ✔ (Accepted)	H_0T1 ✔ (Accepted)	H_0N1 ✔ (Accepted)
2	There is a significant difference per gender regarding SAWiC's…	H_0A2 **x** (Rejected)	H_0T2 **x** (Rejected)	H_0N2 **x** (Rejected)
3	There is a significant difference per province regarding SAWiC's…	H_0A3 ✔ (Accepted)	H_0T3 **x** (Rejected)	H_0N3 **x** (Rejected)

From Table 9.11 it can be concluded that there is a significant positive attitude towards SAWiC's outcomes in measuring their acceptability, as well as the utilisation of their training and networking opportunities by both male and female entrepreneurs in all nine provinces. Except for H_0A3, which only had a medium practical effect, and both with excellent Means (above 3.5), no significant difference could be found in the responses of males and females, neither in the responses from the provinces.

The acceptance by men of SAWiC is an important finding for SAWiC as one of their slogans is "Women in Construction ... Supported by Men in Construction". As SAWiC is a women association, no males can become contractor entrepreneurs in SAWiC, but in order to obtain the support of males the policy of SAWiC to include males under the 'Service Provider' category seems to be successful.

A medium practical difference exists between Free State & Gauteng. Despite the fact that SAWiC is based in Midrand, the lack of large provincial differences points out that SAWiC succeeds in being accepted and being utilised by all provinces equally.