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Validation of the Schutte Self Report Emotional Intelligence Scale in a Zambian Context

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Abstract: This study aimed at determining and validating the Schutte Self-Report Emotional Intelligence Test (SSEIT) in a Zambian context. It examined the feasibility of its use in this cultural context. Additionally, the study aimed at examining the reliability of the instrument when used in the same context. The participants were drawn from two cohorts (2016/2017 and 2017/2018 academic years) of first year students from the Department of Mathematic sand Science Education at the Copperbelt University in Zambia. One hundred and seven (25 females and 82 males) students from the 2016/2017 cohort and 138 (47 females and 91males) students from the 2017/2018 cohort participated in the study. The process of validating the instrument involved factor analysis. Using Principal Components Analysis (PCA), the Monte Carlo PCA for Parallel Analysis and Varimax methods for both cohorts, a four factor structure model of the SSEIT was reported. The instrument was reliable with a Cronbach coefficient of 0.79 in the 2016/2017 Cohort and 0.74 in the 2017/2018 Cohort. The study concluded that the SSEIT is a reliable and valid tool to measure the emotional intelligence of first year students from the Department of Mathematic sand Science Education at the Copperbelt University in Zambia.

Keywords: *Emotional intelligence, SSEIT, Cronbach's Alpha, factor analysis, principal components analysis.*

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Introduction

The concept of emotional intelligence has been an area of study in the recent past in many disciplines, especially in Business studies (Team FME, 2014). It is often argued that people with high emotional intelligence levels are better able to handle their situations and circumstances. Mayer and Salovey (1997) have defined emotional intelligence as the ability of an individual to perceive access and generate emotions so as to assist thought. They further assert that emotional intelligence is the ability to recognize and regulate emotions in order to promote emotional and intellectual growth. According to Goleman (1995) emotional intelligence encompasses five characteristics and abilities: Self-awareness, Mood management, Self-motivation, Empathy and Managing relationships. The five characteristics are sometimes referred to as the components or elements of emotional intelligence. A person is said to be emotionally intelligent if he is able to utilize all the five elements or components of emotional intelligence.

Mayer and Salovey (1997) define emotional intelligence as "the ability to perceive accurately, appraise, and express emotion; the ability to access and/ or generate feelings and the ability to regulate emotions to promote emotional and intellectual growth" (p. 10). Unlike Goleman, Mayer and Salovey (1997) assert that emotional intelligence has four components, namely: managing emotions, understanding emotions, facilitating thought and perceiving emotions. However, Schutte et al. (1998), basing their model on the Salovey and Mayer (1990) model of emotional intelligence, identified a one factor structure of the SSEIT with the following three components: appraisal and expression of emotion in the self and others, regulation of emotion in the self and others and utilization of emotions in solving problems.

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Measuring Emotional Intelligence

Emotional Intelligence, just like IQ can be measured. Literature suggests that there are mainly two ways to measure Emotional Intelligence Quotient (EQ) namely: by self-report questionnaires and by performance. In most cases the self-report questionnaire is used to measure EQ. Self-report questionnaires involve asking students to rate themselves using a questionnaire so as to come up with a self– report (McPheat, 2010). Self – report questionnaires are popular since they are easier and cheaper to devise and administer than other means of measuring EQ. Some self – report questionnaires measure the emotional intelligence based on its five components while other self – report questionnaires measure emotional intelligence based on four components of emotional intelligence where two of the components are combined as one. Emotional intelligence assessment is divided into five components each component assessed by a different sub-scale (Claxton, 2005).

A large number of tools have been developed and used to measure emotional intelligence. The tools developed include: the Mayer – Salovey – Caruso Emotional Intelligence Test (MSCEIT), the Emotional Quotient Inventory (EQ-I), the Emotional Competence Inventory (ECI) and the Schutte Self-Report Intelligence Test (SSEIT). In this study, the Schutte Self-Report Intelligence Test (SSEIT) was used as a tool to measure emotional intelligence. The SSEIT is also referred to as the Assessing Emotions Scale (AES), the Emotional Intelligence Scale (EIS), the Self-Report Emotional Intelligence Test (SREIT), the Self-Report Emotional Intelligence Scale (SREIS), or the Schutte Emotional Intelligence Scale (SEIS). The SSEIT is a self-report test developed by Schutte and her colleagues (Schutte et al., 1998). The test measures four factors: expression of self's emotions, understanding of others emotions, regulation of emotions, and utilization of emotions. The items are scored on a 5 point Likert scale (1= strongly disagree, 2= disagree, 3= neither agree nor disagree, 4= agree, 5= strongly agree). The SSEIT yields a total score ranging from 33 to 165 with higher scores indicating greater emotional intelligence (Schutte et al., 1998). The researcher chose to use the SSEIT out of so many other scales because, the SSEIT measures total emotional intelligence instead of just parts of emotional intelligence and the researcher set out to determine the total emotional intelligence of the students in a Zambian context.

Development and validation of the SSEIT by Schutte et al. (1998)

The Schutte Self Report Emotional Intelligence scale was developed with items based on the Salovey and Mayer (1990)'s model of emotional intelligence. Schutte et al. (1998) indicate that they used the original model of emotional intelligence of Salovey and Mayer (1990) as a basis for the development of a self-report measure of emotional intelligence. They argue that this was done with the hope that this model of emotional intelligence would provide a solid foundation for a measure of individuals' current level of emotional intelligence. In developing and validating the instrument, Schutte et al. (1998) recruited 346 (218 females, 111 males and 17 did not indicate their gender) university students and people from diverse backgrounds from a metropolitan area in the southeastern United States as participants. The average age of participants was 29.27, *S.D*. = 10.23. Schutte et al. (1998) extracted 33 items proposed to be homogenous in nature from a pool of 62 items based on the Salovey and Mayer (1990) model of emotional intelligence. The 346 participants rated themselves on each of the 62 items using the five-point response scale, on which 1 represented "strongly disagree", 2 represented "disagree", 3 represented "neither disagree nor agree", 4 represented "agree" and 5 represented "strongly agree," to indicate the extent each item described them. Schutte et al. (1998) asserts that a principal-components, orthogonal-rotation, factor analysis of the responses of the 346 participants to the 62 items resulted in a scree plot of eigenvalues that showed four factors which had items loading at 0.40 and above. The first factor had an eigenvalue of 10.79 and 33 of the items loaded at 0.40 or above on this first factor. The second through fourth factors in the solution had eigenvalues of 3.58, 2.90 and 2.53, respectively. In that study, Schutte et al. (1998) found that an internal consistency analysis of the 33-item scale showed a Cronbach's Alpha of 0.90. This implies that the items did not contradict each other. The current study aimed at finding out the factor structure of the SSEIT in samples of 107 and 138 university students at the Copperbelt University in Zambia. In addition, the study aimed at establishing the reliability of the instrument in the same context.

Studies have been conducted in other parts of the world to determine the factor structure of SSEIT. For instance, in India, a study (Angayarkanni & Raja, 2016) involving 238 participants used Principal Components Analysis (PCA) to extract components and later orthogonally rotated them, resulting in a three component solution. Another study involving an Indian sample, was one conducted by Arunachalam and Palanichamy (2017) to investigate the factor structure of the SSEIT, In that study 860 students (599 males and 231 females) across different educational institutes in India participated in the study. The study aimed at determining the factor structure of the SSEIT in that sample. Exploratory Factor Analysis was conducted and the results indicated a four factor structure with 58% of the total variance. The study only allowed factor loadings above 0.4 to be extracted as was the case with Schutte and colleagues (Schutte et al., 1998). In the study by Arunachalam and Palanichamy (2017) it was observed that out of the 33 items, items 4, 5, 12, 21, 31 could not load on any of the four factors extracted. The four identified factors were Appraisal of Emotions, Social Skills, Emotion Utilization and Optimism / Mood Regulation. In the study by Arunachalam and Palanichamy (2017), it was observed that a uni-dimensional structure as suggested by Schutte et al. (1998) could not be recovered. However, a four factor model of emotional intelligence identified in that study agrees with the models of other researchers (Petrides & Fumham, 2000; Saklofske, Austin, & Minski, 2003). Furthermore, in the study by Austin,

Saklofske, Huang Sandra and McKenney (2004) only three factors were identified: Optimism/Mood Regulation, Utilisation of Emotions and Appraisal of Emotions.

In South Africa, Jonker and Vosloo (2008) conducted a study to examine the psychometric properties of the SSEIT [referred to in that study, as the Schutte Emotional Intelligence Scale (SEIS)] for 341 Economic Science students from a higher-education institution as participants. Using factor analysis a six dimensional factor structure of the instrument was reported. The six factors were Positive Affect, Emotion-Others, happy Emotions, Emotions-Own, Non-verbal Emotions and Emotional Management.

Researchers have established that all the 33 items in the SSEIT load on a single factor (Ciarrochi, Chan Amy, & Bajgar, 2001; Schutte et al., 1998). This is the reason why the SSEIT is said to measure overall emotional intelligence. However, this overall emotional intelligence is broken down into four components, referred to as components of emotional intelligence (Schutte et al., 1998).

The purpose of the current study was to determine the underlying factor structure of the SSEIT and establish whether the structure of the SSEIT would be consistent with previous research, when the instrument is used in a Zambian context with a sample of university students. Furthermore, the study wishes to determine the reliability of the instrument when used in the same context

Method

Research Participants

The study involve two cohorts of first year students (2016/2017 and 2017/2018 academic years). One hundred and seven (25 females and 82 males) from the 2016/2017 cohort participated in the study, while 138 (47 females and 91 males) from the 2017/2018 cohort participated in the study. The age range of the participants was from 17 to 23 years old. The students were enrolled in the Department of Mathematics and Science Education at the Copperbelt University in Zambia. The Copperbelt University is the second largest public university in Zambia and the Department of Mathematics and Science Education prepares would be science and mathematics secondary school teachers. The science specializations are Biology, Chemistry and Physics.

Research Instrument

The instrument employed in this study was the Schutte Self-Report Intelligence Test (SSEIT). Students participated in the study by completing the SSEIT. The SSEIT is a self-report questionnaire developed by Schutte et al. (1998). The instrument has 33 items whose responses are indicated on a 5 point Likert scale ranging from 1 representing strongly disagree to 5 representing strongly agree. The SSEIT measures total emotional intelligence. The SSEIT was used in this study for the purpose of validating the instrument in a Zambian context.

Reliability of the SSEIT

According to Schutte et al. (1998), the reliability tests of the SSEIT yielded high results. A Cronbach's Alpha of 0.790 was reported for the sample of 346 university students and individuals from different communities. In the current study the internal reliability of the SSEIT for a sample of 107 first year students in the 2016/2017 cohort was 0.79, while for the sample of 138 first students in the 2017/2018 cohort was 0.74 as shown in Table 1:

Table 1. Reliability of the SSEIT

	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No. of Items
2016/2017	.79	.807	33
2017/2018	.74	.752	33

Research Procedure

The researcher administered the SSEIT on which the participants in both cohorts rated themselves on each of the 33 items using the five-point response scale.

Analysis of Data

For both cohorts (2016/2017 and 2017/2018), data was analysed using Cronbach's Alpha and factor analysis through the SPSS version 23 software. Cronbach's Alpha was employed in order to determine the reliability of the SSEIT while factor analysis was employed in order to establish the number of factors associated with the 33 items in the SSEIT.

Using factor analysis 33 items were to be reduced or summarized using a smaller set of factors or components. Factor analysis is said to depend on two conditions in order to be conducted successfully: i) sample size and ii) strength of the

inter-correlations among the items. Researchers suggest that a sample of 150 should be the minimum (Pallant, 2007). Others suggest that sample size should be looked at in terms of the ratio of subjects to items. For instance, Leech, Barrett, & Morgan (2005) argue that "the larger the sample size, especially in relation to the number of variables, the more reliable the resulting factors usually are" (p. 76). Along similar lines Pallant (2007) cites Tabachnick and Fidell (2007) suggesting that a ratio of 5 cases for each item is adequate in most cases. In the current study there are 33 items and so there are supposed to be a minimum of 33 x 5 = 165 cases or participants. However, the 2016/2017 cohort had 107 cases , while the 2017/2018 had 138 cases for the study. Even though that is the case, the researcher believes that data analysis could still be carried out with these numbers since the inter-correlations among the items are strong. The correlations in the correlation matrix are recommended to be greater than .3. Two statistical measures are also generated by SPSS to help assess the factorability of the data: Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy. The Bartlett's test of sphericity should be significant ($p<.05$) for the factor analysis to be considered appropriate. The KMO index ranges from 0 to 1, with .6 suggested as the minimum value for a good factor analysis (Pallant, 2007). The researcher employed principal components analysis in order to extract the number of underlying factors or dimensions of the construct of emotional intelligence. In this study the KMO value was .602, and the Bartlett's test was significant ($p<.001$), for the 2016/2017 cohort, while for the 2017/2018 cohort the KMO value was .572, and the Bartlett's test was significant ($p<.001$). In both cohorts the KMO value exceeded the recommended value of .5 (Field, 2013). Therefore, factor analysis was appropriate for both Cohorts.

Results and Findings (2016/2017 Cohort)

In the 2016/2017 cohort, principal components analysis revealed the presence of twelve components with eigenvalues exceeding 1, as shown in Table 3:

Table 3. Total Variance Explained

Components	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.550	16.817	16.817	5.550	16.817	16.817
2	2.150	6.514	23.331	2.150	6.514	23.331
3	2.099	6.362	29.693	2.099	6.362	29.693
4	1.960	5.941	35.634	1.960	5.941	35.634
5	1.668	5.054	40.688	1.668	5.054	40.688
6	1.539	4.662	45.350	1.539	4.662	45.350
7	1.345	4.075	49.425	1.345	4.075	49.425
8	1.299	3.936	53.360	1.299	3.936	53.360
9	1.284	3.890	57.250	1.284	3.890	57.250
10	1.185	3.591	60.841	1.185	3.591	60.841
11	1.135	3.441	64.282	1.135	3.441	64.282
12	1.081	3.277	67.559	1.081	3.277	67.559
13	.990	2.999	70.558			
14	.906	2.747	73.305			
15	.885	2.681	75.986			
16	.762	2.310	78.296			
17	.702	2.127	80.423			
18	.686	2.080	82.502			
19	.613	1.856	84.358			
20	.602	1.825	86.183			
21	.552	1.672	87.855			
22	.515	1.560	89.416			
23	.484	1.466	90.882			
24	.430	1.304	92.186			
25	.412	1.250	93.436			
26	.382	1.157	94.593			
27	.352	1.068	95.660			
28	.319	.966	96.627			
29	.285	.865	97.492			
30	.251	.761	98.253			
31	.232	.704	98.957			
32	.196	.595	99.552			
33	.148	.448	100.000			

Since using the Kaiser criterion yielded so many factors (twelve), it was helpful to investigate further the number of factors to be retained. To do that Parallel analysis, as an additional technique was used. Parallel analysis involves comparing the size of the eigenvalues with those obtained from a randomly generated data set of the same size. Only those eigenvalues that exceed the corresponding values from the random data set are retained (Pallant, 2007). Researchers contend that Parallel analysis is the most accurate approach in identifying the correct number of components to retain. While the Kaiser's criterion and the screen test can be used to determine the number of factors, both are said not to be very accurate techniques of extracting components since they tend to overestimate the number of components to be extracted (Pallant, 2007). Therefore, the researcher used a programme called Monte Carlo PCA for Parallel Analysis which is said to be an accurate measure of the number of components to be extracted. To further determine the number of components to retain, the program requires three pieces of information in order to be carried out, namely: the number of variables being analysed (in this case 33); the number of subjects in the sample (in this case 107); and the number of replications (usually specified at 100). Then the programme is asked to calculate the number of components to retain.

The task at this point was to compare the eigenvalues obtained in SPSS with the corresponding eigenvalues obtained from the random results generated by parallel analysis. If the SPSS value is larger than the criterion value from parallel analysis, then that factor was retained; if the SPSS value was less, then that factor was rejected. Table 4 shows the eigenvalues from PCA and the corresponding criterion values from parallel analysis:

Table 4. Comparison of eigenvalues from PCA and the corresponding criterion values from parallel analysis

Component number	Actual eigenvalue from PCA	Criterion value from parallel analysis	Decision
1	5.550	2.2386	Accept
2	2.150	2.0373	Accept
3	2.099	1.9100	Accept
4	1.960	1.7960	Accept
5	1.668	1.7013	Reject
6	1.539	1.6070	Reject

Thus, four components were extracted from the original twelve. The four components concur with the four components of emotional intelligence advanced by Schutte et al. (1998) and other successive researchers.

After the number of factors was determined, the researcher embarked on the process of interpreting them. In order to achieve this, four factors were to be rotated. Rotating the factors meant to load them in a way that makes it easier to interpret. So the four components were extracted and rotated. The researcher used Varimax with Kaiser normalization rotation method and obtained the results shown in Appendix 2.

Table 5 shows the components with the items associated with the components.

Table 5. Items corresponding to the four factors (2016/2017)

Factors	Items
Perception of Emotion	5, 8, 9, 15, 18, 25, 27, 29, 32
Managing Own Emotions	3, 21, 22, 28, 31
Managing Others' Emotions	1, 11, 24, 26
Utilization of Emotion	17, 20, 23
Uncategorized	2, 4, 6, 7, 10, 12, 13, 14, 16, 19, 30, 33

In the 2016/2017 cohort, it is observed that the results of this study support the four factor model of emotional intelligence advanced by other researchers (Petrides and Furnham, 2000). The four factors in Petrides and Furnham (2000) were identified as: optimism/mood regulation, appraisal of emotions, social skills and utilization of emotions. In the current study, the four factors are similar to those of previous research. In this study the factors are: Perception of Emotion, Managing Own Emotions, Managing Others' Emotions and Utilisation of Emotion

Results and Findings (2017/2018 Cohort)

In the 2017/2018 cohort, principal components analysis revealed the presence of thirteen components with eigenvalues exceeding 1, as shown in Table 6:

Table 6. Total Variance Explained

Total Variance Explained						
Components	**Initial Eigenvalues**			**Extraction Sums of Squared Loadings**		
	Total	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
1	4.036	12.229	12.229	4.036	12.229	12.229
2	2.118	6.417	18.646	2.118	6.417	18.646
3	1.906	5.775	24.422	1.906	5.775	24.422
4	1.710	5.182	29.604	1.710	5.182	29.604
5	1.530	4.636	34.239	1.530	4.636	34.239
6	1.459	4.423	38.662	1.459	4.423	38.662
7	1.401	4.245	42.907	1.401	4.245	42.907
8	1.309	3.965	46.872	1.309	3.965	46.872
9	1.270	3.849	50.722	1.270	3.849	50.722
10	1.226	3.716	54.437	1.226	3.716	54.437
11	1.148	3.480	57.918	1.148	3.480	57.918
12	1.121	3.397	61.315	1.121	3.397	61.315
13	1.064	3.223	64.538	1.064	3.223	64.538
14	1.000	3.030	67.568			
15	.970	2.938	70.506			
16	.898	2.723	73.229			
17	.815	2.469	75.698			
18	.785	2.380	78.077			
19	.781	2.367	80.444			
20	.716	2.170	82.614			
21	.656	1.989	84.604			
22	.637	1.930	86.534			
23	.603	1.829	88.362			
24	.536	1.623	89.985			
25	.510	1.546	91.531			
26	.479	1.453	92.983			
27	.425	1.288	94.271			
28	.382	1.157	95.428			
29	.360	1.091	96.519			
30	.350	1.062	97.581			
31	.292	.885	98.466			
32	.270	.819	99.285			
33	.236	.715	100.000			

Extraction Method: Principal Component Analysis.

As in the 2016/2017 cohort, Parallel Analysis was conducted using Monte Carlo PCA for Parallel Analysis. Comparing the eigenvalues obtained in SPSS with the corresponding eigenvalues obtained from the random results generated by parallel analysis yielded the results shown in Table 7.

Table 7. Comparison of eigenvalues from PCA and the corresponding criterion values from parallel analysis

Component number	Actual eigenvalue from PCA	Criterion value from parallel analysis	Decision
1	4.036	2.0544	Accept
2	2.118	1.90583	Accept
3	1.906	1.7898	Accept
4	1.710	1.6954	Accept
5	1.530	1.6182	Reject
6	1.459	1.5415	Reject
7	1.401	1.4703	Reject
8	1.309	1.3966	Reject
9	1.270	1.3785	Reject
10	1.226	1.3070	Reject
11	1.148	1.2469	Reject
12	1.121	1.1831	Reject
13	1.064	1.0091	Reject

Thus, four components were extracted from the original thirteen, just as was the case for the 2016/2017 cohort. The four components are similar with those in the 2016/2017 cohort (see Appendix 3. Table 8 shows the components with the items associated with the components.

Table 8. Items corresponding to the four factors (2017/2018 cohort)

Factors	Items
Perception of Emotion	1, 5, 8, 9, 11, 15, 18, 19, 22, 29, 32
Managing Own Emotions	3, 10, 12, 16, 23, 27
Managing Others' Emotions	4, 24, 25, 26, 30
Utilization of Emotion	7, 17, 20, 31
Uncategorized	2, 6, 10, 13, 14, 21, 28, 33

In the similar way as in the 2016/2017 cohort, the results in the 2017/2018 cohort support a four factor model of emotional intelligence advanced by other researchers. Table 8 shows the four factors with the items associated to them.

Discussion of Results and Findings

The purpose of this study was to explore the factor structure of the SSEIT in a Zambian sample consisting of first year students from the Department of Mathematics and Science Education at the Copperbelt University. The researcher wished to establish whether the structure of the scale used in this study, using a sample of Zambian students would be consistent with findings of Schutte et al. (1998) and other successive researchers employing the SSEIT in their studies (Petrides & Furnham, 2000; Saklofske, Austin and Minski, 2003).

Schutte et al. (1998) dealt with the development and validation of an instrument based on the model of emotional intelligence of Salovey & Mayer (1990). The research by Schutte et al. (1998) resulted in the SSEIT, which is a self-report measure of emotional intelligence. The SSEIT was developed from a 62 item questionnaire which after factor analysis resulted in a one factor solution of 33 items. The one-factor solution resulted into the following categories of emotional intelligence: appraisal and expression of emotion in the self and others, regulation of emotion in the self and others, and utilization of emotions in solving problems. The categories appear to be three, but they can be split into the following: i) appraisal and expression of emotion in the self, ii) appraisal and expression of emotion in others, iii) regulation of emotion in the self and others, iv) and utilization of emotions in solving problems. The current study with a sample first year students in a public Zambian university reveal categories similar to the above four. In this study, the four categories are: i) optimism/mood regulation, ii) appraisal of emotions, iii) social skills and iv) utilization of emotions. Petrides & Furnham (2000) identified this structure of the SSEIT also. Saklofske et al. (2003) replicated the four category structure in their study. However, Austin et al. (2004) revealed a different number of categories; with three categories identified: Optimism/Mood Regulation, Utilisation of Emotions and Appraisal of Emotions.

Schutte et al. (1998) in their development and validation of the SSEIT revealed that the instrument had a Cronbach's Alpha of 0.90 for the 33-item scale for the sample of 346 university students and others in a metropolitan area in the southeastern United States. This showed that the SSEIT had good internal consistence. This is to say the items were consistent in measuring the concept of emotional intelligence with this sample. In the current study, with a sample of 107 and 138 first year students enrolled in the Department of Mathematics and Science Education, Cronbach's Alpha was 0.79 and 0.74 in the 2016/2017 and 2017/2018 cohorts respectively. Thus, this showed that the instrument was reliable with this sample of students too.

However, this study had some limitations. First, the sample size was small. Researchers recommend a sample greater than 150 participants adding that the bigger the sample size the better and the more reliable the results will be (Pallant, 2007). Apart from the sample size, the current study had the limitation of numbers in terms of gender distribution. There were only 12 females against 85 males and this has the potential of affecting results since males and females differ in terms of their emotional intelligence (Wang & Shi, 2007; Schutte et al., 1998). The other limitation was that since the SSEIT is a self-report measure, it was susceptible to faking good (Schutte et al,. 1998). An additional limitation of the study was that the SSEIT was administered in English and not all first year students in the study were proficient in the language. Therefore, it cannot be assumed that all the participants understood the question items fully. So an element of guessing on the items a candidate did not understand was possible. Apart from the above limitations, the question of social and cultural context may have had an effect on the results. The SSEIT was originally developed and validated in a metropolitan area in the southeastern United States. Apart from university students, the study by Schutte et al (1998) included individuals from diverse community settings. However, the current study was limited to first year students enrolled in the Department of Mathematics and Science Education at a public university in Zambia.

Even though there are some limitations in this study, the study could be the beginning into analyzing the factor structure of the SSEIT in Zambian samples and hence generate interest in the concept of emotional intelligence among teacher educators.

Conclusion

The current study set out to explore the factor structure of the SSEIT among first year students in the Department of Mathematics and Science Education at the Copperbelt University in Zambia. Additionally, the study was set out to examine whether the SSEIT was a reliable instrument when used among first year university students in Zambia. The study revealed a four factor structure of the instrument. The four factors for both Cohorts are: Perception of Emotion, Managing Own Emotions, Managing Others' Emotions and Utilisation of Emotion. Cronbach's Alpha was 0.79 for the 2016/2017 Cohort and 0.74 for the 2017/2018 Cohort suggesting that the SSEIT was a reliable instrument to measure the emotional intelligence of first year students enrolled in the Department of Mathematics and Science Education at the Copperbelt University in Zambia.

The researcher therefore recommends the use of the SSEIT to assess the emotional intelligence of first year students enrolled in the Department of Mathematics and Science Education at the Copperbelt University in Zambia. Additionally, the SSEIT is recommended to be used in other tertiary institutions in Zambia to assess the emotional intelligence of students and determine the effect of students' emotional intelligence on their learning of different courses. Future research may focus on the reliability of the SSEIT for more than one institution. It is further suggested that, in order to enable generalization of the findings the SSEIT be used on larger samples

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Appendix 1:

The Schutte Emotional Intelligence Test

The 33-item emotional intelligence scale

1. I know when to speak about my personal problems to others
2. When I am faced with obstacles, I remember times I faced similar obstacles and overcame them
3. I expect that I will do well on most things I try
4. Other people find it easy to confide in me
5. I find it hard to understand the non-verbal messages of other people*
6. Some of the major events of my life have led me to re-evaluate what is important and not important
7. When my mood changes, I see new possibilities
8. Emotions are one of the things that make my life worth living
9. I am aware of my emotions as I experience them
10. I expect good things to happen
11. I like to share my emotions with others
12. When I experience a positive emotion, I know how to make it last
13. I arrange events others enjoy
14. I seek out activities that make me happy
15. I am aware of the non-verbal messages I send to others
16. I present myself in a way that makes a good impression on others
17. When I am in a positive mood, solving problems is easy for me
18. By looking at their facial expressions, I recognize the emotions people are experiencing
19. I know why my emotions change
20. When I am in a positive mood, I am able to come up with new ideas
21. I have control over my emotions
22. I easily recognize my emotions as I experience them
23. I motivate myself by imagining a good outcome to tasks I take on
24. I compliment others when they have done something well
25. I am aware of the non-verbal messages other people send
26. When another person tells me about an important event in his or her life, I almost feel as though I have experienced this event myself
27. When I feel a change in emotions, I tend to come up with new ideas
28. When I am faced with a challenge, I give up because I believe I will fail*
29. I know what other people are feeling just by looking at them
30. I help other people feel better when they are down
31. I use good moods to help myself keep trying in the face of obstacles
32. I can tell how people are feeling by listening to the tone of their voice
33. It is difficult for me to understand why people feel the way they do*

Note: The authors permit free use of the scale for research and clinical purposes.

*These items are reverse scored.

Appendix 2:

Rotated Component Matrix 2016/2017 Cohort

	Component			
	1	**2**	**3**	**4**
Qn28	.722			
Qn30	.700			
Qn23	.626			.408
Qn3	.616			
Qn31	.605	.305		
Qn18	.527	.337	.354	
Qn21	.433			
Qn19				
Qn2		.687		
Qn32	.304	.607	.337	
Qn26		.538		
Qn1		.534		
Qn11		.500		
Qn10		.356		
Qn29	.316	.332		-.311
Qn17		-.327		
Qn25			.525	
Qn5	.467		.520	
Qn15			.517	
Qn9			.513	
Qn27			.501	
Qn8			.453	
Qn22			.320	
Qn7				
Qn6				
Qn14				.586
Qn4				.561
Qn24		.309		.549
Qn33				-.506
Qn20			.438	.484
Qn13				.432
Qn16	.356			.398
Qn12				

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

Appendix 3:

Rotated Component Matrix 2017/2018 Cohort

	Component			
	1	**2**	**3**	**4**
Q21	.563			
Q18	.552			
Q29	.513		.336	
Q22	.473			
Q8	.466			
Q9	.449			
Q19	.415			
Q1	.409			
Q32	.373		.338	
Q15	.337			
Q5	.337			
Q11	.326			
Q13				
Q17		.685		
Q20		.673		
Q7		.500		
Q2		.483		
Q26			.575	
Q4			.559	
Q30			.556	
Q24			.492	
Q31		.457	.477	
Q16			.398	.339
Q25			.359	
Q6			.338	
Q14				
Q3				.677
Q10				.593
Q12		.357		.572
Q23		.362		.546
Q27				.313
Q33				
Q28				

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 5 iterations.