

## Education and Training Program to Change Consumer Attitudes towards Rural Water Service: A Transmission Learning Process

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**ABSTRACT** In South Africa, rural water service provision has faced challenges due to limited attention given to socio-behavioural aspects of consumer attitudes compared to technology and policies. Thus, it has become important to attend to and explore socio-behavioural aspects and interventions that could improve the situation. The present study measures consumer attitudes towards and knowledge of rural water service provision, after undergoing an education and training program. Participatory Rural Appraisal (PRA) Research principles were applied and the education and training program was delivered using transmission learning. Knowledge improvement of the participants was significant and there was considerable improvement in skills attainment. Improved knowledge showed a mean 0.5 before and mean of 0.8 afterwards with a Cronbach's alpha co-efficient of 0.6. The average p-value of the t-tests was 0.0032, reflecting great improvement in knowledge. The findings of this study informed that the knowledge improvement does not determine attitude change. Attitude change was not substantial, qualitative results confirmed that there is a difference between 'understanding' and 'believing'. Participants remained apprehensive about changing their values, beliefs, perceptions and experiences. In fact, there is a need for more research to explore what drives consumer perceptions, attitudes and behaviours. There is also a need for a wider learning process that could deal with the complexities in rural water service provision as well as attitude-behaviour changes.

### INTRODUCTION

South Africa has recently been dominated by protests over water service delivery. This is, despite the fact that 90.8 percent of the population has access to piped water; and 76.9% has access to improved sanitation (Statistics SA 2012: 1). However, there is an observed non-use of the services due to non-payment, vandalism and lack of maintenance. Rivett et al. (2013: 409) are of the opinion that improved water service delivery is seen in urban areas while most rural communities still lag behind because their municipalities are under-resourced. In addition, poor service provision in South Africa stems from various factors such as mistrust between consumers and water providers because of a lack of communication; unclear roles and responsibilities; inadequate management of resources;

and a lack of support amongst stakeholders. These problems may be exaggerated by underestimating the importance of consumer socio-behavioural aspects when planning and designing water programs.

Several policies acknowledge that improved water technology; socio-behavioural and socio-economic aspects; and institutions, all should be of equal importance when addressing water service delivery (RSA 1997; Muller 2005: 7). Consequently, as reported by Tapela (2013: 1) water service delivery issues in South Africa "have been (and still are) a part of a range of conflated grievances that masquerade under the general rubric of 'service delivery' issues and underpin many rallying calls for social protest action". Despite the fact that socio-behaviour is suggested to be equated to all other mentioned aspects, research shows that in practice there is minimal attention given to consumer behaviour as, most of the time, consumers are not consulted during the planning stages – it is only when problems occur that the focus changes to socio-behavioural aspects (Kappelman and Richards 1996: 26; Tan and Kaufman 2000: 1). Neglect of the socio-behavioural aspects has been blamed on the time and expense required for proper research (Carter et al. 1999: 295).

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Abukhzam and Lee (2010: 62) concurred that user attitude is the key determinant in the acceptability, utilisation and maintenance of services delivered. It is, therefore, becoming important to attend to and explore socio-behavioural aspects and interventions that could improve the situation.

The overall aim of the present research is to measure consumers' attitudes towards and knowledge of rural water service provision, after undergoing an education and training program. The specific objective is to assess the effect of transmission learning in changing consumer's attitudes and increasing knowledge.

### Complexities in Attitude Change Processes

Studies conducted on attitudes have explored that the process of changing attitudes is a complex one (Abukhzam and Lee 2010: 60). Hence, over the years, researchers have been engaged in debates and intensive research to simplify, explain and interpret this complexity. To date, no consensus has been reached on this matter, except mutual agreement on the fact that attitude has an evaluative element (Eagly and Chaiken 1993: 1; Kempen 2002: 242; Assael 2004: 214; Abukhzam and Lee 2010: 63). Attitudes are made of beliefs that influence the way in which an object is perceived, leading to an evaluative element (Peter and Olson 2005: 135). Rogers (2003: 185), Assael (2004: 224) and Abukhzam and Lee (2010: 64) stated that the contents of the Theory of Reasoned Action (TRA) model is an appropriate criterion to explain the attitude-behaviour relationship.

The TRA has acquired a significant reputation from several fields that deal with social and behavioural changes as it is understood to predict behaviour in controlled situations. The TRA (Rogers 2003: 183) suggested that people are deliberate about the action that they present. It also assumed that beliefs, expectations (which are usually associated with needs and feelings) and motives affect attitude (Rogers 2003: 185; Peter and Olson 2005: 156; Abukhzam and Lee 2010: 63). Sponarski et al. (2014) argued that beliefs and expectations determine trust and subsequently affect attitude formation. According to the TRA model, beliefs held about an object result in an attitude towards performing or not performing certain behaviours. Besides, beliefs that influence behaviour are mainly linked to

one's perceptions, experiences and knowledge, based on direct or indirect learning. A change in belief is easily influenced by what consumers think is expected of them, what is believed to be a social norm and the motive to comply with the expected behaviour. Consumers tend to be resistant to persuasive messages that go against their beliefs. Thus, existing beliefs become the key element in attitude change; and most attitude change interventions involve the improvement of knowledge. The intention aims influencing beliefs by conveying factual and believable messages to construct new experiences, knowledge and beliefs.

### Education and Learning for Attitude Change

Education is a process of carrying out an activity intended to bring about change in one's or a group's attitudes, knowledge, and skills as expressed in behaviour. In fact, the design of the program and how it can impact change is important. Education and learning are interrelated components as learning is viewed as a vehicle to bring change through intervention (Mezirow 1991: 12; Knowles 1998: 14; Foley and Pang 2006: 10; Gazzinelli et al. 2006). To further elaborate on the interrelatedness of these components, it has been realised that people differ - some are more responsive to change and others are not.

Thus, learning is viewed as the key factor in attitude formation and attitude change. It is an action to change knowledge, skill and attitude, which is brought about by using prior interpretation as a basis for new, thoughtful meaning and understanding that directs future course of decisions and actions (Mezirow 1991: 12; Knowles 1998: 14; Foley and Pang 2006: 10). This definition agrees with Mezirow's (1991: 31) idea of the three pillars in a learning process, which are:

- a) the ability to remember, and a critical thinking process;
- b) revision of meaning or interpretation; and
- c) impact on actions.

However, the assumption is that the strength of learning is influenced by the values that consumers hold about the object, their involvement with the message being conveyed, the prevailing mood during the presentation of the message, the frequency of learning, repetition of the message and dual-encoding of the message (learning the information in two different ways).

As a result of the relationship between attitude and learning, the learning process has also undergone several reviews over the years.

### METHODOLOGY

Participatory Rural Appraisal (PRA) was applied in this study. It is a research approach that encouraged active participation of communities in research by using principles that enforced doing research with participants and not on or to them. In this study the PRA principles were applied in the development of the Water Education and Training program, attitude and knowledge assessment and reflections on and evaluation of the workshop.

#### Development of Water Education and Training Program

Following recommendations made by Taylor and Russo (2002: 38), the education and training program was tailor-made to address the primary needs of the target population. Dialogue through meetings, focus group discussions and interviews was created between the researchers and the community. The outcomes of this dialogue exposed the knowledge, beliefs and concerns of the community. The researchers collaborated with the education expert to design a Water Education and Training program called 'WET'.

#### Attitude and Knowledge Assessment

In the present study, the researchers were interested in encouraging active participation, to involve consumers in the message and to create opportunities for the participants to transfer attitude change into new action/behaviour. Attitude questionnaires and knowledge tests with participatory methods were used to assess attitude-behaviour change. Both the statement attitude questionnaire and knowledge test were piloted on a group similar to the target group prior to the main study.

Focus group discussions provided participants with an opportunity to exchange information with the presenter (education expert), learn throughout the process and to drive the learning process. Further, the discussions acted as message reinforcement through repetition of the information to stimulate desired responses. The

rubric tool was mainly used as a qualitative tool to assess the performance of the participants when they were demonstrating domestic water purification and role playing. Qualitative data was collected through the rubric tool because there were three scorers: the researchers, education expert and participants, who observed and assessed each other.

As indicated in the literature, the source also plays an important role in changing consumer attitudes, so an evaluation of the presenter and the program content was conducted to assess the impact of the source on the recipients (Weyers and Rankin 2007: 92; Hoyer and Macinnis 2007: 134). A Facilitation Assessment Scale (FAS), a standardised scale adopted from Weyers and Rankin (2007: 104), was used for this study. The scale measured the following 'levels' of criteria: the facilitator's aptitude; presentation skills; process; appropriateness of the media or channels used; relevance of the message; and the value of the workshop. A four-point Likert scale was used, ranging from 'Strongly disagree' to 'Disagree', 'Agree' and 'Strongly agree'.

#### Sampling Technique

Utilising the transmission learning process, the WET program was delivered to a purposive sample of 20 people over the period of a four day workshop.

#### Data Analysis

The quantitative data from both the attitude questionnaire and knowledge test were analysed using Statistical Analysis Software (SAS Institute Inc 2003). The interpretation of data, and determination of reliability concerning attitude and the knowledge scale, were made using Cronbach's alpha, the t-test and effect sizes. The Cronbach's alpha estimated the reliability of the scale by determining the internal consistency of the test or the average correlation of items within the test. For both scales, an acceptable Cronbach's alpha coefficient was assumed to be above 0.5. It was necessary to calculate the effect size (*d*-value) of both attitude and knowledge scales. According to Venter (2006: 136) and Weyers and Rankin (2007: 99), calculating the *d*-value provides the practical significance of results and verifies the usefulness of the in-

strument. The  $d$ -values for knowledge and attitude data were calculated based on the work of Steyn (2002: 2), Venter (2006: 136) and Weyers and Rankin (2007: 99) by using the following formula:

$$d$$

The  $d$  test was also used for the presenter evaluation:

$$d = \frac{\bar{x} - 3}{s}$$

Where  $\bar{x}_{diff}$  and  $S_{diff}$  are the mean difference and standard deviation of the dependent  $t$ -test, and  $\bar{x}$  and  $s$  are the mean difference and standard deviation of the evaluation test. It determined whether the mean evaluation was significantly higher than the 'Agree' category. Cohen's (1998) guidelines for interpretation of these mean differences are  $d = 0.2$  indicating a small effect;  $d = 0.5$  a medium effect; and  $d = 0.8$  a large effect, but were not applied too rigidly in this study (Kortlik and Williams 2003: 5). This is justified by the statement made by Thompson (2004: 611) when arguing that the magnitude of effect size varies across research areas and should not be treated as rigid cut-off values. The research areas that deal with human behaviour might never achieve 0.8  $d$ -values compared to areas that work within a controlled environment.

For knowledge assessment, a  $t$ -test was performed. A  $t$ -test compares the value of the pre-test mean to that of the post-test mean. A statistically significant  $p$ -value for this study is  $p < 0.05$ . With regards to qualitative data (verbal) from the focus group discussions, content analysis was done using predetermined concepts of water quality, water quantity, and the roles and responsibilities of stakeholders in water service provision.

## FINDINGS AND DISCUSSION

These findings present valuable information in the form of quantitative data about consumer attitudes towards and knowledge of rural water service provision before and after attending the WET program as a workshop, and the impact of the workshop on intended behaviour. The fo-

cus group discussions, including skills assessment, are reported as qualitative data, as is the evaluation of the presenter.

### Demographic Information of the Participants

The following findings give a preview of the type of participants who contributed to the success of this study by completing both the attitude questionnaire and knowledge test. As per the criteria set for the participants of this study, 28% of the participants were between the ages of 20 and 22 years (Table 1).

**Table 1: Age of participants**

Age of participants (years)	Percentage (%)
17 to 19	10
20 to 22	28
23 to 35	19
26 to 28	23
29 to 31	10
32 to 34	0
35 to 37	10

In terms of the gender ratio, females constituted 81% and males 19%. This was not deemed to be unusual because, as a norm, education and training programs are usually attended by women. Yet, men usually take a leading role in decision-making instead of women, who are the main users of services such as water.

With regards to education level, 85% of the participants had matric and the lowest education level was grade 10. The participants were relatively literate, meaning that the participants would be able to read and write if required (Table 2).

**Table 2: Educational level of the participants**

Educational level	Percentage (%)
Grade 10	5
Grade 11	20
Matric	85

### Complexity of Attitude Measurement

There were 40 attitude statements subjected to descriptive analysis to examine the internal consistency and reliability of different subscales. Out of the 40 attitude statements, 13 statements were of practical significance ( $d$ -test). These individual statements are shown in Table 3.

**Table 3: t-tests results of participant's attitude**

S. No.	Variable	N	Pre		Post			
			Mean Attitude before	Standard deviation	Mean Attitude after	Standard deviation	p-value	d-value
1.	Water with a milky colour is bad for drinking	21	1.62	0.92	2.14	0.91	0.08	0.41**
2.	I hate the smell of disinfectant in drinking water	21	1.43	0.75	1.76	1.00	0.15	0.33**
3.	Physical appearance (colour, smell and taste) of water is the only single indicator that determines which water is good for human consumption.	21	1.76	0.83	2.30	0.98	0.09	0.40**
4.	Groundwater needs to be purified before use	21	1.29	0.64	1.00	0.00	0.06	0.44**
5.	I do not trust people who clean water	21	2.14	0.79	1.81	0.81	0.03	0.51**
6.	Water storage containers might affect the quality of water	21	1.76	0.83	1.33	0.66	0.02	0.57**
7.	Hard water has additional costs in a household	21	1.43	0.68	1.14	0.36	0.11	0.36**
8.	I am satisfied with receiving any quality of water services	21	2.00	0.89	1.62	0.86	0.03	0.51**
9.	The far distance of communal taps promotes minimal usages of water	21	1.71	0.85	1.38	0.74	0.09	0.39**
10.	Consumer should pay for in yard tap connections	21	1.76	0.89	1.24	0.54	0.05	0.45**
11.	Installing in-house water connections mean more costs for the owner	21	1.82	0.82	1.50	0.69	0.09	0.45**
12.	I know what to do when I experience problems with my drinking water	21	1.48	0.75	1.05	0.22	0.03	0.53**
11.	I would turn down any water supplier that requires me to pay anything for water service provision	20	1.50	0.76	1.95	0.92	0.07	0.43**

Key: \*\* Medium effect 1 = Agree 2 = Neutral 3 = Disagree

Thirteen statements that improved significantly as a result of the WET process address different aspects of rural water service provision, yet they all indicated the importance of the three attitudinal components. Statements 1, 2, 6, 7 and 24 are linked to the knowledge component as they address beliefs and perceptions. The affective component is presented by statements 5 and 8 as they mention trust and satisfaction, leading to evaluation of the service. Statements 10, 12 and 13 are more closely related to intention as they indicated willingness to take an action.

The above information demonstrates the complex nature of attitudes, as stated by Tailard (2000: 147) there is a distinct difference between 'understanding' and 'believing'. The focus group discussions verified the difference between these two. The values and internalized beliefs influenced how the workshop message was interpreted and transformed. Even after the workshop the participants perceived a 'milky

colour' as being contaminated water. This is because the visual appearance was the most valued water quality aspect compared to the others: 'Crystal water is good for human health'; 'Crystal clear water indicates that the water has been purified'. Values are defined as beliefs that are interconnected to preferences, and these values play a crucial role in consumer consumption activities (Solomon et al. 2007: 43; Abukhzam and Lee 2010: 61). Thus, the values of consumers are important because they could influence acceptance, and consequently the effective use of services.

Further, previous experiences determined participants' perceptions which influenced their attitudes. This was evident because the participants disliked adding disinfectants (such as bleach) to drinking water: 'it causes problems'; 'it causes diseases such as diarrhoea'; 'it can cause stomach aches'; 'it has an unacceptable taste'. There was an incident where many people from the community suffered from stomach

cramps and the addition of chlorine to water was viewed as the cause. Even though, the participants had been given information about the addition of disinfectants to water, prior knowledge and experience blocked the interpretation of the new message. This attitude was linked to the participants' lack of trust of water purifiers. According to Sponarski et al. (2014: 42), people do not accept a specific resource when they do not trust the provider. These findings further supported the notion raised by Rodriguez del Bosque and Jesus-Collado (2006: 412) who stated that information and experiences withheld by the consumer activates a 'wondering-about' process resulting in tension, distrust, insecurity and uncertainty. Sponarski et al. (2014) are of the opinion that trust is built through positive interactions between the service provider and the end user. Researchers from fields such as marketing, health and social psychology have conducted several studies on attitude measuring and refer to it as an inexact science with a complex nature.

### The Knowledge Test

Knowledge was assessed because it resulted from learning that serves as a source of attitude and behaviour formation. The knowledge test proved to have acceptable reliability with a Cronbach's alpha of 0.60. The *t*-test on the knowledge questionnaire was performed on the mean before and after the WET program workshop. It was used to measure the statistical significance of the change in knowledge between pre- and post-measurements. The increase in knowledge was statistically significant ( $p$ -value  $< 0.01$ ) as well as of practical significance with a *d*-value of 0.73. The comparison of means before (67.5%) and after (79.2%) showed signifi-

cant knowledge improvement ( $p=0.01$ ). These findings show similar outcomes as the studies that use transmission learning, according to Gazzinelli et al. (2006:46), there was significant knowledge change in consumers' knowledge after the program.

It can therefore be concluded that the WET program workshop had a positive impact on the participants' knowledge. Significant changes in knowledge occurred with the items relating to physical water appearance and misperceptions, as well as unclear roles and responsibilities of consumers in relation to water system maintenance.

### Impact of the Workshop on Intended Behaviour

Hoyer and MacInnis (2007: 135) supported that the source of the message plays a crucial role in attitude change. The Facilitator Assessment Scale (FAS) adopted from Weyers and Rankin (2007: 92) revealed the impact made by the workshop. This was a standardised scale to administer workshops composed of four easy and reliable levels:

Level 1: affection

Level 2: attitude, knowledge and skills

Level 3: behaviour and

Level 4: learning events contribution to broader environment.

The levels are equated to the subscales used to assess the WET workshop which are aptitude, skills, process, context, relevance and value. These subscales measure the effect of facilitation on the outcomes and systematically assess the effect of learning events on goals of the workshop. Furthermore, the scale has been noted to have positive effects in measuring facilitation in adult education.

Table 4 illustrates that the Cronbach's alpha measure exceeded 0.6 on the criteria: attention,

**Table 4: Impact evaluation of WET program workshop**

Criteria	N	Mean	Std	Effect size	Cronbach's alpha
Facilitator aptitude	21	3.68	0.29	***2.34	0.66
Presentation skills	21	3.73	0.32	***2.30	0.72
Process	21	3.70	0.33	***2.12	0.67
Context	20	3.40	0.37	***1.11	0.68
Relevance of the message	21	3.63	0.32	***1.93	0.63
Value of the workshop	21	3.54	0.36	***1.47	0.63

Key: \* Small effect    \*\* Medium effect    \*\*\* Large effect  
 1 Strongly Disagree    2 Disagree    3 Agree    4 Strongly Agree

the facilitator aptitude; presentation skills; process; context; relevance of the message; and the value of the workshop. For this group of participants, the FAS has proven to be highly reliable and effective, as suggested by Weyers and Rankin (2007: 108).

In this instance, the FAS measured the impact of the facilitator and facilitation of the WET program workshop as greater than 3 or the "Agree" option. As presented in Table 2, all the criteria of attention have proven to be of large practical significance as the lowest *d*-value is only 1.11, with the highest being 2.34. Apart from measuring the impact of the workshop, FAS reflected the involvement of the participants with the message. Du Plessis and Rousseau (2003: 217), and Solomon (2007: 43), regard involvement as a factor that could influence attitude as it affects how much attention and commitment will be given to the message.

As stated by Gazzinelli et al. (2006: 44) there is a difference in improving knowledge and changing behaviour. Behaviour change programs required a broader understanding of their environment, experiences, social belief systems and practices.

### The Skills Assessment of Participants

The focus group discussions were also used to assess the technical skills of the participants. The participants' skill assessment was based on three elements: ability to demonstrate domestic water purification, writing a letter of complaint and role playing their comprehension of following protocol when addressing rural water service provision problems. Using a rubric tool, the majority of participants showed improved competencies in domestic water purification and in writing a letter of complaint. However, there were practices that were still retained by the participants which were demonstrated during the role plays. When the participants were asked to role play laying a complaint they did a dance of protest, that is, '*toyi-toyi*'. The participants still believed that a protest was the best way of relaying dissatisfaction to the government. As mentioned by Tapela (2013: 1), protest mobilisation is the best method used to engage with authorities. This further confirms that beliefs are related to attitudes and attitudes engineer behaviour.

### CONCLUSION

The findings from the present study indicated that transmission learning focuses more on the cognitive component and skills development. Knowledge improvement of the participants was significant and there was considerable improvement in skills attainment, although, attitudes reflected through changed practices, were not changed. The transmission learning approach had limitations on how to reveal the affective and behavioural attitudinal elements. In this study attitude change was not substantial, although, qualitative results confirmed the difference between '*understanding*' and '*believing*'. Participants were still apprehensive about changing their values, beliefs, perceptions and experiences. In fact, attitudes are not easy to change and there are limited techniques to facilitate attitude and behaviour change. Various factors such as consumer experiences and perceptions need to be considered as they were found to be important influencers of attitude formation and change. It can be concluded that knowledge does not necessarily translate into attitude or behaviour change.

Nevertheless, it is important that a consumer's cognitive element be developed as it plays a key role in the formulation of perceptions that, in turn, influence the expectations and preferences of the consumer. The understanding of the influence of consumer perceptions becomes critical as it affects the acceptability, usability and satisfaction - all of which are influenced by the attitudes that the consumers have. It could, therefore, be argued that knowledge is easy to improve compared to attitude. However, knowledge improvement does not determine attitude and behaviour change.

### RECOMMENDATIONS

It is recommended that there is a need for more such researches to explore what drives consumer perceptions, attitudes and behaviours. A wider learning process is required that could deal with the complexities in rural water service provision as well as attitude-behaviour changes.

Quantitative tools would traditionally have been sufficient to assess attitude measurement and knowledge change. Although, there could be some concerns about getting hard numbers about attitudes towards rural water service pro-

vision, it is argued that a combination of both quantitative and qualitative methods provide a complementary value. However, there is still more that needs to be done on improving the integration of the two methodologies. Thus, there is a need to establish a standard guide on how to conduct research that requires the combined use of quantitative and qualitative methods.

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