The 14th International SAAFECS Conference

“Sustainable futures through Consumer Science: Perspectives from the Global South”

Hosted by South African Association of Family Ecology and Consumer Science
at the Saint George Hotel and Conference Centre,

Pretoria, South Africa

3 – 5 March 2020

Word of Welcome

Dear Delegate

The 2020 program for the 14th International SAAFECS conference reflects the variety of research directly or indirectly addressing the theme of Sustainable Futures Through Consumer Science: perspectives from the global South. The program talks to sustainability issues through papers challenging environmental concerns, to consumer related research of everyday challenges to the very essence of food and nutrition concerns. Research exposing the problems, issues and concerns facing consumers, communities and society will be presented at the conference, that will contribute to the solutions and recommendations needed from research to ensure Sustainable Futures for everyone.

The conference will also host several papers that address secondary and tertiary education, teaching and learning initiatives and current research findings that will provide more insight into current situations and possible solutions. The conference aimed to introduce educators to the contribution and value of research in topical areas of interest to Consumer Studies educators. It is hoped that this would encourage a mutual relationship through to benefit the consumer studies learner. In this regard the second day of the conference program is dedicated to stimulate and encourage the relationship between Consumer Science Researchers and Consumer Studies educators by sharing the realities of educators’ class experiences and thought-provoking ideas and findings of current research in the field. This day and its engaging research and practical presentations will direct a Sustainable Future for Consumer Studies and Consumer Science going forward.

A spread of different themes in which relevant and current research is debated will remain the focus of the SAAFECS conference for 2020 to be enjoyed by all delegates who attend this conference. A conference where each delegate can contribute to the Sustainable Futures Through Consumer Science!

Prof. Elizabeth Kempen

Conference Chair
### Table of Contents

#### KEYNOTE PRESENTERS AT THE CONFERENCE

- Ms Dudu Mthuli, Nutrition and Health Manager Africa, Unilever .................................................. 8
- Ms Latiefa Behardien, Head of Food Technology, Safety & Sustainability, Woolworths Foods .......................... 8
- Dr Francois Naudé, Phoenix Education Engineers ........................................................................ 8
- Mr Magoshi Mahlase, SACE ........................................................................................................... 9
- Julie Williamson, E³ (E-Cubed) ........................................................................................................ 9
- Mr Chandru Wadhwani .................................................................................................................. 9
- Prof Geoff Goldman ...................................................................................................................... 10

1. **CLOTHING, TEXTILES AND NEW TECHNOLOGIES** ................................. 11
   - 1909 Sustainable fashion designs through customer relationship management practices 11
   - 1910 Survivalist promotional mix for emerging apparel manufacturers ................................. 12
   - 1911 Self-determined motivations that stimulate voluntary simplistic clothing consumption practices: South African female consumers’ perspectives ................................. 14
   - 1942 How fashion trends influence students’ personality and identity: A case study in the University of Botswana ................................................................................................................. 16
   - 1965 Consumers’ perceived risks during e-tailing purchases .................................................. 18
   - 1992 The impact of modernisation and Christianity on Basotho cultural dress practices . 19
   - 1998 The retail industry: A sustainable approach to sampling and textile waste .......... 21
   - 1945 Perceptions on sustainable fashion among Textile and Styling Students at the Central University of Technology ................................................................................................. 23
   - 1997 Second-hand clothing, the next big eco trend? ............................................................... 25
   - 1939 Consumers’ perceptions with regard to the consumption of Women’s Eco-friendly Golfing Apparel .......................................................................................................................... 26
   - 1940 Statistical modelling of key body dimensions in manufacturing of RTW garments for the South African pear-shaped women ................................................................. 27
   - 1959 The development of a Zimbabwean sizing system for women’s clothing: A case study of a Polytechnic in Bulawayo Metropolitan Region ......................................................... 29
   - 1914 Symbolism of Basotho dress artefacts past and present ................................................. 31
   - 1915 Meaning and symbolism of Basotho dress practices for rites of passage .................... 33
   - 1975 Integrating recent development in textile and design technology with protective clothing in health sector .................................................................................................................. 35

2. **CONSUMER BEHAVIOUR AND DECISION-MAKING** .......................... 37
   - 1946 An integrative model of the influence of materialism on subjective well-being: Mediating role of gratitude, needs satisfaction, power and experiential avoidance .......... 37
1947 Consumers’ knowledge of selected production process claims and the importance of evaluative criteria when purchasing pre-packaged fresh lamb or mutton products ................................................................. 38
1960 The Millennial South African consumers’ attitude versus behaviour regarding slow fashions impact on sustainable consumption ........................................................................................................ 40
1964 Infant vaccinations: towards informed decision-making ................................................................................................................................. 42
1925 The association between urban consumers’ decision-making and their physical well-being ......................................................................................................................................... 44
1941 Investigating the perceptions and consumption patterns of Bambara groundnuts in rural households of KwaZulu-Natal ........................................................................................................................................ 46
1929 Influence of clothing attributes and knowledge of socio-environmentally responsible clothes on customers purchasing behaviour ........................................................................................................ 48
2001 Consumers’ awareness on food safety, quality and willingness to pay for certified food products ........................................................................................................................................ 51

3. EDUCATION, TEACHING AND LEARNING .................................................................. 53

1938 Perceptions of Consumer Science teachers and teacher educators regarding the adequacy of training for primary school Consumer Science teachers, ESwatini ........................................ 53
1948 Mapping lecturers’ teaching and learning expectations of first-time Hospitality Management students in higher education institutions ........................................................................................................ 55
1952 Challenges and strategies for improvement of male students’ low enrolment in Home Economics: A case of Manzini Region in Swaziland .............................................................................................. 56
1966 Enhancing student’s employability skills beyond the classroom ........................................ 59
1968 Benchmarking Home Economics in Zimbabwe with the South African Consumer Studies curriculum to enhance learners’ preparation for life and work ........................................................................ 60
1973 Benchmarking the Botswana Senior Secondary Home Economics syllabus with the South African Consumer Studies curriculum: Insights for improvement .................................................. 62
1922 A critical review of assessment techniques used during teacher training in Home Science Education in Kenya ................................................................................................................................. 64
1982 Insights derived from a curriculum co-development project for sustainable clothing and textile undergraduate courses ........................................................................................................ 66
1944 Apparel design students: An assessment of visual literacy ................................................ 69
1908 Problem-based learning to prepare pre-service Consumer Studies teachers for practical lessons ................................................................................................................................................................. 70
1902 An empowerment model based on experiences of people with disabilities participating in income-generating-activities in a protective workshop ................................................................................................................................. 73
1978 An evaluation of food security interventions: A perspective of food security programme implementers at the University of KwaZulu-Natal, South Africa .................................................................................. 75
1912 Entrepreneurship education fortifying Consumer Studies: A case study ......................... 76
1943 The influence of university students’ accommodation on student academic performance: A case study of University of Botswana........................................................ 78
1924 Exploring the relationship between food security, student progression and retention at a large South African University ...................................................................................... 80
4. ENTREPRENEURSHIP ................................................................. 82
1923 Exploring alternative start-up methodologies for South African entrepreneurial fashion designers ................................................................................................................. 82
1986 Developing and marketing sorghum baked products through the innovation hub: A diagnostic study on national university of Lesotho............................................................. 84
1953 Youth entrepreneurship in informal clothing manufacturing enterprises..................... 86
5. FOOD AND NUTRITION .......................................................... 88
1903 Micro nutrition malnutrition of families Ghana, West Africa: Rural Volta region ....88
1904 Health and climate impacts: Nutrition education & healthy families in the United States Virgin Islands ..................................................................................................................... 90
1928 An observational study of the implementation of the National School Nutrition Programme in three secondary schools in Tshwane ........................................................................ 91
1961 Health-consciousness of working female consumers in relation to their perceived healthiness and selection of packaged foods .............................................................................. 93
1970 Feeding practices of infants aged 0-12 months and knowledge levels of primary caregivers at Esikhaleni, Kwazulu-Natal ................................................................................. 95
1972 Food consumption patterns in two rural wards in UMkhanyakude District, KwaZulu-Natal ..................................................................................................................................... 97
1980 Consumer lifestyle and food knowledge: What will it take to change behaviour? ....99
1984 A systematic desk review of food taboos that affect expectant and lactating mothers as well as infants’ wellbeing .............................................................................................. 100
1993 Mothers’ Nutritional Knowledge in South Africa: The Greatest Ally for Children’s Healthy Eating .................................................................................................................... 102
1994 The influence of food handlers’ menu planning competencies on the nutritional quality of meals in the Gauteng school nutrition programme ....................................................... 104
1996 Food security status of households in Daveyton, a South African township .......... 106
1956 Food preservation and processing in rural households in the Sekhukhune District in Limpopo Province, South Africa ................................................................................................. 107
1926 Effects of maturity on antioxidants content of watermelon juice at different maturity stages .......................................................................................................................... 109
1969 The effect of Amaranthus leaf powder addition on microbial safety and Consumer acceptability noodles ............................................................................................................. 110
1913 Smallholder irrigation scheme farmers’ performance in Tshiombo irrigation scheme Limpopo province, South Africa .......................................................................................... 112
1979 Sustainable livelihoods through indigenous knowledge systems’ informal based financial saving schemes: A perspective on stokvels in Umkhanyande District, South Africa ............................................................. 114

6. **HOSPITALITY MANAGEMENT** .............................................................................................................. 116

1951 Hotel choice attributes of business and leisure travellers in Cape Town ................................. 116

1954 Staff turnover within kitchen departments of restaurants in Cape Town Central Business District ................................................................................................................................. 118

1988 Hospitality subsector employment profile: A case of restaurants based in multiple cities in South Africa ......................................................................................................................................... 120

2000 Perceptions of guest house managers regarding grading and quality management by TGCSA in Tshwane ........................................................................................................................................ 122

1950 Food consumption patterns of first year students at a higher education institutions residences .................................................................................................................................................................................. 124

7. **SUSTAINABILITY AND GLOBALIZATION** ........................................................................................... 126

1906 Determinants’ web for users’ responsiveness to technology adoption and usage continuance: Implication for eclectic resource utilization and sustainable development 126

1917 The impact of sustainability literacy on clothing maintenance: A case study of Tshwane University of Technology, South Africa ......................................................................................................................... 128

1937 Demystifying the knowledge: Integrating IKS and modern science for local weather prediction ......................................................................................................................................................... 131

1949 Perceptions or views regarding possible commercial cultivation of baobab tree by households in the south-east lowveld of Zimbabwe ........................................................................................................................................ 132

1955 Mycotoxins on Bambara groundnut in Mpumalanga, South Africa ............................................................................................................................................................................................................. 134

1963 Sustainability and its various approaches within the department of clothing and textiles – Student’s perspective and approach ......................................................................................................................................... 136

1971 Effects of cloth diapers on babies and the environment ........................................................................ 138

1989 Endangered wild terrestrial orchids, a main ingredient in Chikanda ........................................................................................................................................................................................................... 140

1991 Participatory Citizenry: Call and response to promote socio-economic development (Informal financial mechanisms, indigenous farming and farmers' markets) in Hluhluwe, KwaZulu-Natal ........................................................................................................................................................................................................... 143

8. **STUDENT PAPERS** .................................................................................................................................... 145

1901 The future of environmentally friendly wool scouring alternative (STUDENT PAPER) ..................................................................................................................................................................................................... 145

1916 Analysing food security status among farm workers and Lessess in Tshiombom irrigation scheme Vhembe district Limpopo province (STUDENT PAPER) ................................................................................................. 147

1921 Exploring agricultural knowledge systems and smallholder farmers' empowerment: Implication on household food security (STUDENT PAPER) ........................................................................................................................................ 149

1927 Consumers’ motives for complaint behavioural intention following service failure in the clothing retail context (STUDENT PAPER) .................................................................................................................................................................................. 156
1930 Sensory acceptable product development of *Cissus quadrangularis* to create awareness among young adults (STUDENT PAPER) .......................................................... 158

1933 Triangulation water retting of *Agave Americana L.* leaves to extract fibre: Prospective and sustainable fibre extraction procedure .................................................. 160

1934 Sequential enzymatic bio-softening of *Agave Americana L.* fibre: An essential tool for sustainable textile innovation in the 21st century .......................................................... 162

1935 Manganese peroxidase (mnp) delignification of *Agave Americana L.* fibre: A novel; sustainable textile technology ........................................................................................... 164

1974 The development of an entrepreneurial orientation measurement instrument for South African small businesses that offer custom-made apparel (STUDENT PAPER) ...... 167

1985 Food safety knowledge and awareness in the hospitality industry within Mhlathuze municipality, KwaZulu-Natal Province, South Africa (STUDENT PAPER) .................... 169

1987 The implementation of the national diploma in Tourism and Hospitality Management curriculum at two polytechnics, a case study of two polytechnic colleges in Zimbabwe (STUDENT PAPER) ................................................................. 171

1995 A case study of a school-based nutrition education programme: A behavioural framework of learners’ perceptions and its influence on food choice (STUDENT PAPER) 173

9. **POSTER PRESENTATIONS** .................................................................................. 176

1905 Preference for hospitality study among TVET College graduates in Pretoria, South Africa (POSTER) .................................................................................................................. 176

1907 A literature review in design education: Implications for the Consumer Studies curriculum (POSTER) .................................................................................................................. 177

1919 The influence of information acquisition and knowledge on consumers’ behaviour towards infant vaccinations (POSTER) ............................................................................. 178

1920 Association between anaemia status; anthropometric status and feeding practices in 6-12 months infants living in HIV exposed environment (RETRACTED) ........ .... 180

1931 Exploring water usage habits and practices of kitchen staff in the Vaal region (POSTER) (RETRACTED) ............................................................................................... 183

1932 Analysis of the amounts of tomato inclusions in South African mixed dishes as a contribution towards a vegetable serving (POSTER) .................................................. 185

1936 The influence of ethnic food on the behaviour and culture of the South African society (POSTER PRESENTATION) (RETRACTED) ............................................................. 188

1957 Effects of maturity on antioxidants content of watermelon juice at different maturity stages (POSTER) ................................................................................................. 190

1976 Documenting and contextualising Maasai dressing styles for fashion design purposes (POSTER) ..................................................................................................................... 192

1990 Consumers’ procedural knowledge of genetically modified (GM) food products and how it may affect the purchasing decision (POSTER) .................................................. 195
KEYNOTE PRESENTERS AT THE CONFERENCE

Ms Dudu Mthuli, Nutrition and Health Manager Africa, Unilever

Sustainable nutrition
Sustainable diets are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable, nutritionally adequate, safe and healthy while optimizing natural and human resources, says FAO. Is our current diets especially in South Africa aligned to this? I will explore our understanding and the direction recommended that we should all take from an industry dietitians’ perspective.

Ms Latiefa Behardien, Head of Food Technology, Safety & Sustainability, Woolworths Foods

Good Business Journey – how customer preferences are guiding our strategy and product
A South African retailer’s view on how sustainability influences and shapes product business strategy. We will address how Woolworths is taking a holistic approach through its World of Wellbeing to create a future fit business in an increasingly complex and uncertain world.

Dr Francois Naudé, Phoenix Education Engineers

We need Super Teachers
In a country where education seems to only hit the news headlines tragedy strikes or when the Grade 12 results are celebrated, it becomes difficult for teachers and society at large to value the teaching profession. When compared to other countries’ education systems, South Africa is often depicted as a delinquent with very little progress and even less hope. Yet, this narrative isn’t what I experience when I work with our teachers and learners. I see many positive interactions that give me hope and mobilizes me to continue in my endeavours to motive, inspire and support teachers. I believe that teachers are the key to unlocking the potential of South Africa and that they will achieve this by continuously making a positive difference in their classroom. During this talk I will discuss the characteristics of teachers that truly impact the lives of those they work with. (francois@phoenixed.co.za)
Mr Magoshi Mahlase, SACE

The need for and requirements of educators to register with SACE

The Fourth Industrial Revolution places the educator in an invidious position in that he/she is compelled to continuously acquire new knowledge and equip him/herself with new skills required to stay current in the ever changing technological landscape. CPTD provides the platform for the educator to meet the challenges presented by the Fourth Industrial Revolution. As an educator who has developed through the ranks from Teacher to Head of Department to Principal of a school, and having served a stint as a Gauteng Department Education Official, I have the required experience and expertise to assist educators in their continuing professional development trajectory. Having joined the SACE CPTD team at the inception and piloting of the CPTD system until to date when it is mandatory, I am better placed to advise and train all levels of educators on the implementation of CPTD.

Julie Williamson, E³ (E-Cubed)

Entrepreneurship education planned for South African schools

The Department of Basic Education (DBE) Sector Plan for 2030 aims to lay a sound foundation within the schooling system for future entrepreneurs with a strong focus on skills for a changing world. The E³ programme was established to support the enabling of this sector plan and aims to ensure that by 2030 100% of South African school leavers are entrepreneurs (prepared to start their own businesses), employable (able to find a job) and prepared for further learning (education). The achieve this objective the E³ initiative aims to:

1) equip learners with 21st century skills;
2) develop personal agency through unlocking a mindset that produces value and usefulness to others; and
3) develop a belief in self and ability (Worthington-Smith 2008, 4).

The E³ programme seeks to activate 21st century skills through learner-centred, activity based learning methodologies. Project based learning (PBL) has been selected by the programme as the vehicle to develop these skills. Teachers lie at the heart of transforming teaching and learning and programme activities will focus on building teacher capacity to implement activity based leaning methodologies to bring about change within the system.

Mr Chandru Wadhwani

Can we recycle ourselves to sustainability?

In essence my talk will centre around the misunderstanding around the term “Sustainability”. It will then lead to an overview of many of the misconceptions around recycling in general.
From this we are seeing some misguided solutions coming to market in many areas which threaten more harm than good. I will then offer some examples of what true sustainability entails (in my opinion) and propose recycling solutions that all your audience may relate to regardless of their industry. Finally, in conclusion, will be some meaningful takeaways to give perspective to what recycling can achieve for us in the drive to be sustainable.

Prof Geoff Goldman

Multiple paradigms in Social Science research and the need for more criticality in research

Most disciplines within the social sciences have been characterised by tension between different research paradigms. Paradigms are often seen as opposing and much valuable attention is diverted when efforts are launched to prove the superiority of a preferred paradigm. This presentation seeks to show that instead of taking an opposing stance, paradigms should rather be seen as complementary to one another, and that paradigms can assist in a holistic approach to knowledge creation within any given field of social sciences. Further to this discussion the emphasis then turns to the Critical Theory research paradigm, and illustrates that mainstream convention often has incongruences which can be resolved, if scholars are willing to employ a couple of Critical Theory techniques. The presentation finishes with a caution that being critical entails careful introspection of the area of inquiry, as scholars need to know what to be critical about, and to what extent they need to be critical of it.
1. CLOTHING, TEXTILES AND NEW TECHNOLOGIES

1909 Sustainable fashion designs through customer relationship management practices

Dr I.J. Idowu, Mrs K.F. Kehinde & Dr G.A. Gbenga, Obafemi Awolowo University

e-maildiyaolu@oauife.edu.ng

Key words
Customer relationship management, fashion designers, customers, income

Introduction
Sustainability, a term with global acceptance, is very applicable in the fashion industry today. The difficulty in building customer relationship has led to low confidence and trust. In view of the competitive nature of fashion design, it is necessary to develop a means of keeping customers loyal to the fashion designers. The key success factor for survival in the market is customer retention through sustained long-term relationships (De Madariaga & Valor 2007). Several issues have risen between fashion designers and customers on satisfaction of the designed materials. In most cases, these lead to designers losing their customers especially when the designer is not able to relate well with the customers. Kathleen (2000) posits that customer relationship management practice is an enterprise strategy necessary to secure a proper, useful and consistent communication with each customer. With the use of Customer relationship management practices, fashion designers as managers can therefore offer their customers a variety of products and services, with lower prices and personalized services. The study identified customer relationship management practices (CRMP) used by fashion designers, examined the effect of the practices on customer’s loyalty and identified the benefits of the practices.

Methodology
The study was conducted in Osogbo Local Government Area, Osun State, Nigeria. The fashion designers in the study area were the target population. A total of 150 respondents were selected by simple random sampling. The research instruments for data collection were well-structured questionnaires and interview schedules. Data were collected on the respondents’ socio-economic characteristics, CRMP employed, effect of CRMP on customers’ loyalty and business performance. Descriptive statistics such as frequency and percentages were used to present data. The hypotheses were tested using Chi-square analysis to draw inferences.

Results
Results showed that 88.7% of the respondents, maintained customer relationships through quality services, improved customer satisfaction through service rendering (85.3%) and after sales services to customers (96%). Majority (93.3%) of the respondents always adopt customer retention strategies and 79% continually communicate with and give feedback to
customers. This is in line with Wu, (2008) who opined that designers embrace customer relationship management practices as core business strategies. Correlation analysis showed that there is a significant relationship between the respondents’ income and the CRMP employed.

Conclusions and Recommendations

CRMP aids patronage among the fashion designers in the study area. Therefore, maintaining CRMP will go a long way to improve the business. It is therefore recommended that fashion designers should be more informed on adoption of customer relationship management practices. Fashion designers should also be encouraged to continually provide quality services to customers so that their customers can keep on supporting them.

References

Methodology

A qualitative study was designed to explore the promotional activities of informal CMMEs within a Grounded Theory approach which assisted in developing a theory (Creswell and Creswell 2018 p 134) of the activities used by CMMEs to promote their products and production skills. The incubation hub provided an intrinsic case study location (Lune and Berg 2017) from which the study was conducted. The study included informal (unregistered) apparel design or production micro businesses (CMMEs), who did not exceed five full-time employees, did not have a total turnover per annum of more than R0,20m and a total gross asset value of not more than R0,10m. Data collection included personal interviews with 13 purposefully selected CMME owners from a business incubation hub. Applying the principles of Grounded Theory, data collection was enriched by participant observations and document analysis at the workshops of five of the thirteen CMMEs. This strategy allowed the researcher to find other marketing related information not explicitly shared during the personal interviews. A systematic approach to data analysis particular to Grounded Theory was applied (Creswell & Creswell 2018).

Findings

The findings from this study suggest the prevalence of self-started promotional activities and assisted promotional activities. Assisted promotional activities were not self-initiated by the CMME owners but were provided by the business incubation hub. The CMME owners selectively embraces some of the methods and activities contained in the conventional, innovational and fashion entrepreneur promotional mix strategies. For the participating CMMEs seven self-started promotional activities emerged that form the basis on which the promotional strategy for the business is built. The unconventional use of promotional methods resulted in the survivalist promotional mix particular to the informal CMME in an African context.

Conclusions and Recommendations

In the general marketing context this research has identified an additional promotional mix that should be recognized in the literature and may be applicable to other small businesses outside of the African context. These survivalist promotional methods and activities speak to unconventional and unique ways through which SMMEs such as the informal CMME obtain recognition within the informal township economy. The survivalist promotional mix points to different informative and educational activities to be performed during training of CMME entrepreneurs and support institutions.

References

Self-determined motivations that stimulate voluntary simplistic clothing consumption practices: South African female consumers’ perspectives

Ms H. Taljaard & Dr N. Sonnenberg, University of Pretoria
hanri.taljaard@up.ac.za

Key words
Self-determined motivation, voluntary simplicity, clothing consumption, self-determination theory, sustainability, South Africa

Introduction
The overconsumption of clothing by consumers globally is a significant cause of various social and environmental issues around the world. Unless consumers make a mind shift and are self-motivated to voluntarily consume clothing in more sustainable ways regardless of external/social influences, these issues will prevail and lead to detrimental consequences for generations to come. According to the theory of intrinsic motivation and self-determination (i.e. the Self-Determination Theory (SDT)), adopting simplistic, non-materialistic lifestyles would require self-determined motivation (Deci & Ryan, 1985). This type of motivation includes intrinsic motivation (associated with pleasure and enjoyment), integrated regulation (executed to accomplish personal outcomes) and identified regulation (identifying with a behaviour on a conscious level and personally endorsing it) (DeHaan & Ryan, 2014). It should be mentioned that although three types of self-determined motivation exist in theory, it is very often not distinguishable to the everyday consumer and warrants further investigation. That said, comparatively few research studies have tested and applied the SDT to explore and explain the topic of self-determined motivation and voluntary simplistic clothing consumption practices in the global context, and even less, if any, have been conducted in the local context of South Africa. This study therefore investigates the prevalent self-determined motivations of South African female consumers regarding voluntary simplistic clothing consumption practices (i.e. reducing, reusing, repairing, recycling and refusing clothing in a sustainable manner) and creates a foundation for further research, (especially in terms of the scale items and analysis) surrounding the SDT and voluntary simplistic clothing consumption practices in an emerging market context.

Methodology
A structured, self-administered online questionnaire was developed and distributed via Qualtrics. Items were derived from a previous study relating to the Motivation Toward the Environment Scale (MTES) (Pelletier, Tuson, Green-Demers, Noels & Beaton, 1998) and were adapted and rephrased for this study. A seven-point Likert-type agreement scale was used to measure the applicable constructs. The questionnaire was pre-tested to ensure correct wording and the survey eventually yielded 482 responses of which 469 (97.3%) were usable. A non-probability purposive sampling approach was chosen that focused on female consumers as they generally tend to be more willing to take part in socially responsible initiatives. Additionally, they could also potentially influence others around them by acting as early adopters of voluntary simplistic clothing consumption practices. Majority of the female
respondents were between 21 and 39 (79%) and have some sort of tertiary degree or diploma (79%). Almost half of them (47%) earn an approximate income of between R 5 001 and R 25 000. That said, it must be emphasized that the intention of this study was not to generalise the findings but rather to discover specific areas of interest that warrant further investigation and to create future research agendas.

**Results**

Initial exploratory factor analysis (EFA) was conducted using Principal Axis Factoring as the extraction method and Varimax with Kaiser Normalization as the rotation methods. Two factors, as opposed to the three theoretical constructs, were extracted labelled as follows: (1) integrated regulation (INT) that portrays sustainable clothing practices as integral or fundamental parts of the female consumers’ lives and (2) identified regulation and intrinsic motivation (IDEN) that has to do with enjoyment and reasoning. The Cronbach’s alphas (α) for INT (α = 0.910) and IDEN (α = 0.858) were deemed reliable as they exceeded the acceptable threshold of 0.7. The subsequent confirmatory factor analysis indicated factor loadings ranging between 0.695 and 0.909, exceeding the acceptable threshold of 0.5, indicating a strong relation between items and factors (Hair, Black, Babin & Anderson, 2014:617). The Average Variance Extracted (AVE) indicated satisfactory convergence for INT (AVE = 0.717) and IDEN (AVE = 0.605), exceeding the minimum threshold of AVE ≥ 0.5. The measurement model fit indices were as follows: CMIN/DF = 2.850, p < 0.05, GFI = 0.973, AGFI = 0.949, RMSEA = 0.063, NFI = 0.977 and CFI = 0.985. The sample size of this research study (N = 469) presented a good model fit, but ongoing analysis (including a structural equation model) and modifications could ensure excellent thresholds throughout.

**Conclusions and Recommendations**

Once motivations become self-determined, consumers are more persistent in pursuing practices such as voluntary simplistic clothing consumption. Theoretically, this study addresses an important gap in existing literature and creates a basis for further empirical research. Practically, this study could aid in the development of policies that facilitate the transition to voluntary simplistic clothing consumption lifestyles that originate from the consumers themselves, rather than rules and regulations that enforce such behaviours. Furthermore, stakeholders and governmental organisations could benefit from this study by making use of the findings to alter strategies (such as the National Strategy for Sustainable Development and Action Plan and the South African Green Economy strategy) and encourage businesses to market sustainable options in such a way that will promote self-determined behaviours amongst consumers to ultimately increase the market share of sustainable clothing options in South Africa (Department of Environmental Affairs, 2019; Enviropaedia: Rethinking Reality, 2017). Effort should be made in future to recruit more representative samples, which will enable further insight and provide the opportunity to compare the various demographic categories. Future research could also be conducted in other developing countries to compare whether the outcomes in South Africa corresponds to other emerging contexts and hence allow for more insight into such markets.

**References**


1942 How fashion trends influence students’ personality and identity: A case study in the University of Botswana

Ms O. Mpho, Dr B. Mantyi-Ncube & Dr P. Disele, University of Botswana

omprompho@yahoo.com

Key words
Fashion, trends, personality, identity

Introduction
At the beginning, clothing was basically a need designed to cover the body, a need that is dictated by the norms of social conduct. Fashion did not have a deeper influence on people’s characteristics, personalities and identity (Nirmala, 2008). People were just wearing clothes without really sending messages about who they are. Fashion clothing nowadays, is a media of information about the person wearing it (Barnard, 2010). Clothing has become a part of the self-realization of every person. It is necessary to recognize that at the present moment fashion has a deeper influence on people’s lives and is not only something to cover the body. The present time offers variety of styles and gives people the opportunity to reveal their personality and identity. Currently, students follow fashion trends blindly and want to be associated with certain social groups and peers. It is normal for a college student who is in the identity creation stage of Erickson’s psychosocial development cited by Reynolds (1968) to look for trendy dress choices. They fail to establish who they are and their identity because they are trying to fit in a group of people they want to be associated with, perceive appropriate and trending. As a result, they convey certain meanings unaware, hence, influencing how people behave towards them and how they are classified socially. The study enabled students to appreciate that through fashion, they visually communicate who they are, who they will like to be, and what kind of social group they belong to and who they are most likely not to be associated to. Above all, they should know that they are unique; therefore fashion trends might help them express their identities or uniqueness and thereby find and feel their sense of belonging. The purpose of this study intended to explore how
fashion trends really influence students’ personality and identity in the University of Botswana. The specific objectives of this study were to: determine factors influencing students’ adoption of fashion trends; identify the impact of fashion trends on students’ personalities and identities; and, assess the reflection of fashion trends among the students.

Methodology
A descriptive research design study was used. A convenience and random sampling method was chosen for the study. The questionnaire consisted of closed-ended and open-ended questions. A total sample of 80 respondents was randomly selected from three different faculties within the University to fill-in the questionnaires. Thirty was from Faculty of Humanities, 30 from Faculty of Education and the last 20 was from Faculty of Sciences. This study was not gender-biased. Both males and females willing to take part from the targeted groups were allowed and given time to participate.

Results
Sixty three percent of the respondents believed that a person’s personality can be reflected through his or her clothing and 33.8% believed that what a person wore did not reflect any personality. This result showed that majority of the respondents believed that what a person wears can reveal that person’s personality and this has been proven in other researches. Chamil, Viranga, Rathnayake (2011) also emphasized that fashion and trends preferences tell an individual about the personality of that person. Fifty four percent of the respondents bought or wore trendy items to look presentable, 16.3% wanted to be unique, 8.8% wanted to fit in and feel a sense of belonging; and lastly, 6.3% of the respondents wanted to show their social status. In prior researches, it has been found that college students like to wear trending items to show their status, personalities, and identities; whereas, in the University of Botswana, the respondents revealed that they were more into trendy items to look presentable rather than to convey certain meanings about their personalities hence they could not be judged from their appearances. However, according Dodd, Clarke, Baron, and Houston, (2000), fashionable clothing is the symbol or a way to communicate status and a person’s personality in the society rather than to look presentable.

Conclusions and Recommendations
The study results concluded that respondents followed fashion trends in their routine lifestyles to look presentable; to show status, and to be associated with certain groups. Although respondents were aware that what they wore conveys certain meanings about their personalities and identities, they confirmed that they did not wear clothes nor follow fashion trends to display their identities, but rather to reflect how they felt at that particular time. Since the results of this study cannot be generalized to the whole University of Botswana, the researcher recommends that this study be conducted with all faculties in the University and at other Universities in Botswana.

References
1965 Consumers' perceived risks during e-tailing purchases

Ms C.C. Brits, Dr N. Le Roux, Mrs H. Dreyer & Dr H. Van Staden, North-West University
23410868@nwu.ac.za

Key words
Consumer behaviour, e-tailing, perceived risks, coping strategies

Introduction
Technology simplifies consumers’ lives by offering a purchasing channel considered to be convenient, make easy price comparisons and saves consumers time (Li et al., 2018:100; Lim & Ayyagari, 2018:360). In an online environment, retail related products can be purchased on e-tailing sites. Recent information obtained by Ipsos and PayPal revealed that South African consumers will spend an estimated of 61 billion South African rand (ZAR) on e-tailing purchases by the year 2020 (Thompson, 2019). To add, South African consumers’ spending on consumer goods purchases from e-tailing sites increased with 4.2% from 2018 to 2019 (Data Reportal, 2019). This is an indication that South African consumers increasingly make use of e-tailing, however, consumers in the North-West Province (NWP) only contributed 3.51% to e-tailing purchases as last measured in 2016 (Effective Measure, 2016:9) of which Potchefstroom forms part. Therefore, it is apparent that consumers residing in the NWP possibly experience risks confining them to make use of e-tailing compared to consumers residing in metropolitan cities of South Africa. As a result, this study explored the risks consumers experience with e-tailing.

Methodology
A qualitative descriptive research approach was used to explore consumers’ risks the experience with e-tailing. Both male and female South African consumers, 18 years and older with previous experience in online purchases that reside in NWP, Potchefstroom formed part of the inclusion criteria for the focus groups. In order to reach suitable participants, purposive- and snowball sampling were used for recruitment. Even though this study was qualitative of nature, a short questionnaire was given to participants before the focus groups started to obtain basic demographic information. This data added to richness to the descriptive findings.
Results
A total of 31 participants formed part of the focus group discussions of which the majority were females (90.3%) and 87.1% of the participants had tertiary qualifications. Furthermore, more than half (67.7%) of the participants indicated that they made e-tailing purchases on a monthly basis. There were a variety of aspects that contributed to participants’ experienced risks, including having a preference for physical stores, having a negative e-tailing experience, also associating product-, financial-, website-, social- and psychological risks with e-tailing. All of these mentioned risks resulted in participants abandoning their purchases or making use of an alternative purchasing method.

Conclusions and Recommendations
Although e-tailing is a method of making purchases consumers resort to, there are still consumers who are hesitant to make purchases due to risks experienced. These findings can serve as recommendations to retailers and e-tailing companies to lessen the risks experienced and ease the e-tailing process. To add, due to the lack of research on this subject, this study also serves to provide a base for future studies in the field of Consumer Sciences.

References

1992 The impact of modernisation and Christianity on Basotho cultural dress practices

Mrs B. Pheto-Moeti, Dr J. Vermaas & Prof A. Pelser, University of the Free State
mabokangm7@gmail.com

Key words
Impact, modernisation, Christianity, dress practices, Basotho culture

Introduction
The study investigated the impact of the contact of the Basotho people with the western or modern society in relation to their cultural dress practices. Trollip (1994) demonstrated that the Ndzundza-Ndebele after their contact with the Europeans shifted their values and
ideology. The adoption of the western lifestyle by the Ndzundza-Ndebele has resulted in parents not encouraging their children to maintain their traditional dress practices with the consequence that such practices have disappeared with passing generations. The exposure of the Bosnian women to the western way of living caused them to challenge their dress practices (Workman & Freeburg 2009). Kaiser (1990) posited that technology also played a crucial role in the development of social structure. It influences society’s culture and ideology. Perani and Wolff (1999) submitted that the introduction of European clothing in Africa should have facilitated creativity leading to the blending of the African dress styles with the western, not complete abandonment of the indigenous dress styles. A positive aspect of adopting the western lifestyle for women was the opportunity for liberation from the patriarchal domination by male over certain cultural dress practices (Ross 2008).

The introduction of Christianity in Africa around the 18th century became the major driver for the adoption of the western dress and so were urbanisation and education (Ross 2008). Pheto-Moeti (2005) and Mokorosi (2017) indicated that in the same manner, the arrival of the Christian missionaries in Lesotho and the British rulership during the same period further contributed to the erosion of cultural dress practices and popularised the western dress culture.

**Methodology**

The research design followed a mixed method approach. The explanatory sequential mixed methods were used because the researcher chose to undertake the quantitative survey in the first phase. The results were used to direct the qualitative component that was undertaken in the second phase to clarify issues raised by the quantitative results (Creswell (2014). The target population of the study comprised of the Lesotho College of Education (LCE), Maseru campus staff and students for the quantitative component. For the qualitative phase, some of the college students and staff were engaged and the elderly people from Ha Belo in Botha-Bothe and Ha Mosuoe in Quthing as part of the population.

Based on a 5% confidence interval and a 95% confidence level a sample size of 132 was determined from 200 staff members and 233 from a population of 590 students. Data was gathered through open ended and closed questionnaires that were administered to the participants. Qualitative data was purposefully gathered from LCE staff and students in Maseru and elderly people from selected villages in the districts of Quthing and Botha-Bothe. At LCE two focus groups were conducted consisting of five staff members and seven students. Eleven elderly persons from Ha Mosuoe in Quthing and 13 at Ha Belo in Botha-Bothe were interviewed.

**Results**

The analysis of the questionnaires revealed that 72.52% of the staff and 53.00% of the students were of the view that Christianity had positive influence on the Basotho cultural dress. The students who represented the youth had a negative attitude towards cultural dresses practices. They preferred to have choice and freedom for dress. The interviewees and the focus groups showed that there was a major impact on dress as a result of Christianity. The culture of thapo was on the verge of dying. In families where it was still practiced it had undergone several modifications. The fabric and black colour were regarded as depressing and some families had opted to use colours of their choice. Staff (51.13%) and students
(46.73%) supported the use of synthetic material to replace the cultural mose oa khomo. The interviews and focus groups revealed that some people preferred the use of synthetic material because it was readily available as opposed to animal skin. A stronger voice from the interviewees however indicated that the synthetic fabric did not accurately represent the cultural dress.

**Conclusions and Recommendations**

Generally the impact of Christianity and modernisation was felt to be positive because it encouraged decency and there was a wider choice for adorning oneself especially for women. It is recommended that the school curricula should incorporate elements of cultural practices in order to cultivate cultural interest among the youth.

**References**


---

**1998 The retail industry: A sustainable approach to sampling and textile waste**

*Dr M. Venter-De Villiers & Ms M. Nel, University of the Witwatersrand*

*Marike.venter@wits.ac.za*

**Key words**

Eco-friendly fashion, sampling, sustainable fashion; textile waste

**Introduction**

The environmental impact of the fast fashion industry on natural resources are detrimental, and this industry may soon be one of the biggest contributors to pollution in the world. (Ozdamar-Ertekin, 2017). One of the main problems with fast fashion is the volume of goods produced, and the rate at which production occurs is largely due to the high demand and rapid supply of cheap, disposable fashion from catwalk into the mass-retailing market within a significantly short time frame (Bosco, 2019). These rapid and continuous style changes put
pressure on fashion buyers to increase sampling production, which leads to textile waste and waste creation that often ends up in landfills (Bick, Halsey & Ekenga, 2018). The sampling procedure has become one of the most vital stages in the fashion process and entails different phases of product testing and development (Bartolacci, 2019). The purpose of product sampling is to create product prototypes before mass production occurs with the aim of eliminating potential technical, quality or design risks (Lucas, 2017). However, a major drawback of the product sampling process is the lack of awareness of the environmental consequences once the samples are discarded. A common practice among fast fashion retailers is throwing the samples in the dustbin from where it makes its’ way to landfills. The purpose of this study was therefore to gain insight into the sampling procedure that occurs as part of the fast fashion cycle by underpinning unsustainable practices, and to provide sustainable solutions for eliminating sampling textile waste that poses harm to the environment.

Methodology
By means of a qualitative study, seven in-depth interviews were conducted with fashion buyers within the South African fast fashion industry. The researcher approached the respondents in a face-to-face setting and the research instrument comprised open-ended questions with opportunities for probing. The interviews were voice recorded and transcribed, after which the data analysis was conducted using thematic analysis.

Findings
The findings therefore point towards the fact that the sampling procedure entails unsustainable practices that is harmful to the environment. Firstly, a large number of samples are discarded into rubbish bins, especially those that are damaged or have been mutilated, which end up in landfills. Secondly, the materials and textiles that are used to produce samples are not biodegradable and are therefore harmful to the environment. Thirdly, fashion buyers order too many samples that are not used and end up in the dustbins and ultimately in landfills. Lastly, due to the rapid fast fashion cycle and short product life cycles, the production cycle requires a lot more samples to be produced.

Conclusions and Recommendations
By considering the three R’s of sustainability (reduce, reuse and recycle), fast fashion retailers should take a more conscious approach to the sampling procedure and consider the negative impact of their production practices on the environment. This study provides fast fashion retailers with insight into how they can adjust their current sampling processes to incorporate a more eco-conscious approach.

References
1945 Perceptions on sustainable fashion among Textile and Styling Students at the Central University of Technology

Ms M. Le Roux, Cape University of Technology

lrouxm@cut.ac.za

Key words
Sustainability, fast fashion, organic fabrics, reinvented garment, recycled garments, longevity

Introduction
The fashion and textile industry has a devastating impact on the environment. This industry is the second largest polluter in the world (Fletcher 2007:120). With the emergence of "fast fashion", the fashion industry is growing more rapidly than in the past, resulting in extensive ecological damage. World-wide, the consumption of fibres reached 11.4 kg per capita during 2016, with the highest demand for apparel fibres (37.6 kg per capita) found in the United States, followed by Europe (31.21 kg) and China (1.08 kg) (Quantis, 2018). Collectively, this fibre consumption accounts for 8.1% of the global climate impact. The effect of the apparel industry’s production on climate change, increased by 35% from 2005 to 2016 and is anticipated to progressively increase in the future (Quantis, 2018).

Environmental sustainability is questioned with the continual appearance of new trends and products in the fast-evolving fashion industry. Sustainability suggests that everything viewed as sustainable is on-going, and represents stability or ‘staying put’, whereas in fashion the goal is to persistently move forward and change, in order to come up with new ideas and styles (Smal, 2008). In South Africa, it is very difficult to run a fashion business sustainably, because of the lack of suitable environmentally sustainable materials. Furthermore, the deteriorating South African textile industry makes it difficult, and expensive, to work within an environmentally sustainable context. The all-inclusive and inclusive approach in fashion design education has now become compulsory (Smal, 2008). According to Thakara (2006:7-17), sustainability is unquestionably a design issue, because 80% of any creation or organisation’s impact on the environment is resolute at the design stage. Therefore, bringing about change at the design stage can “direct change”, thus designers have the potential to initiate comprehensive sustainable practices in the fashion cycle (Smal, 2016). The aim of the study was therefore to investigate which type of sustainable fashion methods were
acceptable for the implementation in the designs of senior Textile and Styling students in the National Diploma of Design and Studio Art.

**Methodology**

A qualitative approach was followed in this research project. Data were collected from senior Textile and Styling students (n = 30). Students were presented with a questionnaire consisting of open-ended questions regarding four methods to implement sustainability in fashion garments. These methods were; longevity in garments, recycling of garments, reinventing used garments and creating organic garments. Students had to rank these four sustainable methods in order of preference. Data was also collected through structured interviews. This data was encoded into clusters to identify trends in fashion sustainability.

**Results**

The data revealed that students (86.7%) would prefer organic garments followed by recycled garments (60%). The next popular choice was trend longevity of garments (46.7%). Reinventing used garments, proved to be the least popular amongst the students (26.7%). The outcome of this study shows that senior Textile and Styling students are aware of sustainability trends and are willing to include sustainable fashion practises in their designs.

**Conclusions and Recommendations**

Considering the increasing effect of the fashion and textile industry on the environment, it has become imperative to bring about change to the industry towards producing garments in a more sustainable manner. From this study it could be concluded that students studying in Textile and Styling were interested in addressing sustainable garment production. This strongly suggests that the curriculum should be amended to include sustainable fashion practises. Therefore by implementing more sustainable fashion practises, incremental changes to sustainability in the industry can minimize the carbon footprint of the fashion industry if enough institutions incorporate sustainable practices.

**References**


Smal, D.N. 2016. The role of environmental sustainability in a design-driven fashion industry: A South African case study. Thesis submitted in fulfilment of the requirements for the degree Doctor of Technology: Design in the Faculty of Informatics and Design at the Cape Peninsula University of Technology


1997 Second-hand clothing, the next big eco trend?

Dr M. Venter-De Villiers & Ms J. Ramoshaba, University of the Witwatersrand
Marike.venter@wits.ac.za

Key words
Eco-friendly fashion, second-hand clothing, sustainable

Introduction
In recent years, the fashion industry has been associated with the exploitation of both people and resources (Beard, 2008; Fletcher, 2008; Morgan & Birtwistle, 2009). This is largely due to the emergence of the fast fashion concept, which entails rapid and continual style changes where clothes quickly lose their appeal, become out-of-fashion, and are then disposed (Fletcher, 2008). This cycle often entails appalling working conditions in sweatshops with low wages, child labour and a significant amount of textile waste that ends up in landfills (McRobbie, 1997; Wilson, 1985). Although the awareness of the negative implications of ‘mindless fashion production and consumption’ is growing (Ertekin and Atik (2015) fast fashion remains to be a popular choice among the youth. This is especially prevalent in South Africa, a poverty stricken country where a vast number of young adults are unemployment and living in poverty (StatsSA, 2018). Despite being in poverty, the celebrity conscious culture and fashion products frequently portrayed on the growing intrusive social media platforms in South Africa pressurizes the consumers to purchase fashion and luxury products (Roberts, Yaya & Manolis, 2014). Young adults are therefore more vulnerable to the temptation to purchase fast fashion products. A possible solution to the detrimental effects that the fast fashion industry has on the environment is the revival of the second-hand clothing trend. Although the popularity of second-hand clothing has gained momentum among selected consumer segments, the adoption rate of such remains slow. The main purpose of this study was to explore consumers’ perceptions of the second-hand clothing trend, and to gain insight into factors that inhibit the adoption of second-hand clothing. This study also aimed to investigate whether consumers are aware of the negative implications of the fast fashion industry and their likelihood to shift their clothing purchases to that of second-hand clothing.

Methodology
By means of a quantitative study, fifty young females were asked to complete a semi-structured questionnaire. The researcher approached females between the ages of 18 and 35 in a face-to-face setting and hard copy questionnaires were handed out to the participants. Once collected, the data was captured in a Word Excel sheet, coded and analysed.

Results
The results indicated that although they had an awareness of the negative consequences of fast fashion, they lacked detailed insight into the pertinent affects of fast fashion on the environment. Further, a number of factors inhibit their decision to buy from second-hand stores: firstly, the accessibility to the latest trends were not always available in second-hand stores; secondly, the convenience of shopping from a chain store outweighs the
inconvenience of searching for, and finding a second-hand store; and lastly, they perceived second-hand clothing to pose a hygiene risk.

**Conclusions and Recommendations**

The findings of this study provide fashion marketers, and second-hand clothing stores, with insight into how they can incorporate the second-hand clothing trend into their strategies and marketing campaigns in an attempt to make the fashion industry more sustainable.

**References**


---

**1939 Consumers’ perceptions with regard to the consumption of Women’s Eco-friendly Golfing Apparel**

*Ms S. Naidoo & Prof E.L. Kempen, Tswane University of Technology*

*naidooSA@tut.ac.za*

**Key words**

Consumers, eco-friendly, consumption, women’s golfing apparel

**Introduction**

Many retailers are recognizing the need for a sustainable way of doing business and across industries we see companies such as Nike embedding sustainability into the DNA of their brands. In the sportswear industry, most of the environmental impact occurs during the design process where decisions are made regarding the selection of materials and manufacturing processes. With the expansion of women’s golf in South Africa little market research has been done to understand how consumers perceive eco-friendly qualities when purchasing sport apparel. The consumer decision making process provides a rich area of research to gain knowledge on how female consumers evaluate apparel quality particularly on sustainable practices towards eco-friendly women’s golfing apparel.
Methodology

The study used a qualitative research paradigm by means of a convenience sample. The unit of analysis was 25 women golfers, who are members of respective Golf Clubs in Gauteng. Data was collected through means of a multi-method approach which allowed the researcher to use different data collection instruments for the study. In this regard two focus group discussions, a design card sort and a sentence completion exercise were used in the study.

Findings

The findings showed that there was a growing interest from participants concerning the environment and they preferred more product choices available to them to make better purchase decisions such as the strong aesthetic design qualities coupled with comfort, fit and eco-friendly textiles.

Conclusions and Recommendations

The findings of this study contribute to improving the understanding of intention to purchase green products, which could play a major role towards sustainable consumption. Future research should examine a larger sample size to ensure a better representation and could also focus on the different body shapes in South Africa.

References

- 1940 Statistical modelling of key body dimensions in manufacturing of RTW garments for the South African pear-shaped women

  Ms O. Ola-Afolayan, Prof P. Zwane & Prof A. Mastamet-Mason, Tswane University of Technology

  Olaafolayan1962@yahoo.com

Key words

Statistical modelling, size-chart, regression analysis, key dimensions, South African pear-shaped women

Introduction

Research on anthropometric body measurements have increased globally due to several garment fit problems continuously encountered in the ready-to-wear industry. Anthropometric body measurement has always been a crucial process in the development of size charts for specific population groups for garment manufacturing (Gupta, 2004). This paper’s focus is on the statistical modelling of key body dimensions in the manufacturing of RTW garments for the South African women of medium height category of ages 25 to 55 years old. The South African pear-shaped women have always bought two different sizes in the
same colour for the upper torso and the lower torso (bottom) of the garment e.g. skirt and trouser garments due to the difficulties of finding garments sizes that fits their body top and bottom (Ola-Afolayan & Zwane, 2019:4; Makhanya et al., 2014; Ola-Afolayan & Mastamet-Mason, 2013). The absence of a representative size-chart for the South African pear-shaped women that offer well-fitted garments for their unique body shape, has resulted in the need for a sizing system that will relate to the body shape of these women. The purpose of this paper is to develop a statistical modelling of key dimensions of bust, waist and hip using regression model as prediction for sizing of ready-to-wear garments manufacturing for the South African pear-shaped women.

Methodology

The bust measurement range for the medium height category body dimensions obtained from the pear-shaped participants were used to develop the measurement range using least-squares regression analysis in modelling of key body dimensions for garment sizing. The slopes (a1) and intercepts (a0) were computed in Statistical Packages for the Social Sciences (SPSS) software version 25.0. The medium height category of women consisted 57.3% (n=86) of the sample (aged between 25 and 55 years) in the size 16 to size 24 size range. Size specifications were used for the size model predictions in line with the findings of other studies such as Makhanya et al. (2015), Adu-Boakye et al. (2012) and Gupta (2004).

Results

Hip and bust were found to be highly correlated at R value = 0.996 (99.6%), model fitted perfectly at R value = 0.993 (99.3%). Bust measurement was significant in predicting the waist at p=0.002<0.05 significant level, model was fitted perfectly at R value = 0.827 (82.7%).

Conclusions and Recommendations

Findings of the simulated values for hips and waists at different sizes based on bust measurements suggest that the values obtained respectively were almost the same with the graded body measurements, making the model dependable, reliable and valid for the size-chart determination of the South African pear-shaped women. The paper confirms the dependent of hips and waist on the bust measurements in the statistical modelling of key body dimensions in manufacturing of RTW garments for the South African pear-shaped women. Consequently, the paper meets the need of an honest and consistent regression model for size chart development for the South African pear-shaped women’s body type. It is therefore recommended that intending investors in the clothing manufacturing sector in South Africa, should adopt the developed model for predicting South African pear-shaped women’s garment sizing manufacturing.

References

1959 The development of a Zimbabwean sizing system for women’s clothing: A case study of a Polytechnic in Bulawayo Metropolitan Region

Ms S. Dlodlo, Dr B. Mantyi-Ncube & Ms P. Marume, Bulawayo Polytechnic
libadlodlo@gmail.com

Key words
Sizing system, fit, body shape

Introduction
This paper aims to develop a sizing system in clothing for Zimbabwean women in order to solve fit problems related to regular fitting clothing. Methodology- A quantitative approach was used to generate descriptive statistics from the raw data to obtain five sizes of a body measurement table. A sample of 75 women aged between 20-55 years across the country, registered their girth measurements of different stature within ethnic groups. Findings- Size codes, size limits, grading increment and verifiable size charts are generated. Research implications- this study contributes greatly to knowledge of size charts to Technical and Vocational Education and Training (TVET) learners and Fashion Designers in the Clothing industry by providing a detailed procedure involved in developing research-based anthropometric data and will serve as the basis for other future research in Zimbabwean and in Southern Africa. Originality/value –The results can be used by educators in TVET institutions and Clothing industry to develop a size chart on anthropometric body measurements for Zimbabwean women.

Clothing is expected to conform to body shape always in order to achieve a perfect size and a well fit. As such, women all over the world demand well fitting clothes regardless of body shapes. Clothing manufacturers in Europe and Asia taken great steps in developing various sizing system in women clothing. In Africa, Ghana has followed suite, while in Zimbabwe clothing manufacturers have adopted foreign sizing system, which produces ill-fitting clothes for women.

America, German and England have developed a sizing system for a rectangular stature (Ujevic’, D., Rogale, D., Drenovac, M., Pezelj, D., Hrastinski, M., Naranc’ic’, S.N., Mimica, Z. and Hrzˇenjak, R. (2006). In Asia, Japan, China and India among other countries have
developed their own sizing systems that suit their petite stature (Gupta, Garg, Arora, & Priyadarshin, 2006). In Africa- Ghana has developed a sizing system which fits women with pear shaped stature (Adu-Boakye, Power, Wallace, and Chen (2012). In Zimbabwe, there has been no sizing system developed for women’s clothing.

Methodology
The study used a descriptive study. Research Approach- Mixed methods (Qualitative and Quantitative). Research design – a case study. Population and sampling procedure- Population- A sample of 75 women aged between 20-55 years across the Polytechnic, as they patronize ready-to-wear apparel. Purposive sampling techniques. Data collection instruments- Data collection instruments which were used in this study are questionnaire and semi-structured interview, focus group discussions for triangulation. The research instruments were piloted and thematic analysis was employed. Data analysis- Social Package for the Social Sciences (SPSS), Version 23 for Windows was employed. There were 7 Height and 9 girth measurements of each tribes were analysed using Co-efficient Correlation in order to help in measuring the linear associations between the two measurements.

Results

![Correlation Table]

<table>
<thead>
<tr>
<th></th>
<th>Height</th>
<th>Waist</th>
<th>Burst</th>
<th>Hip</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Height</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Height</td>
<td>1</td>
<td>.076</td>
<td>.117</td>
<td>.092</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td><strong>Waist</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waist</td>
<td>.076</td>
<td>1</td>
<td>.956*</td>
<td>.660*</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.757</td>
<td></td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td>N</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td><strong>Burst</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burst</td>
<td>.117</td>
<td>.956*</td>
<td>1</td>
<td>.841**</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.633</td>
<td>.000</td>
<td></td>
<td>.000</td>
</tr>
<tr>
<td>N</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td><strong>Hip</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hip</td>
<td>.082</td>
<td>.860**</td>
<td>.841**</td>
<td>1</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.738</td>
<td>.000</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
</tr>
</tbody>
</table>

**Correlation is significant at the 0.01 level (2-tailed).**

Conclusions and Recommendations
In conclusion, the establishment of a National Sizing System and the development of Zimbabwean Sizing System for women’s clothing was successful. It will facilitate production strategies of mass production and customer satisfaction in size and fit.

The size range of the sizing system developed covered over 90% of the women measured in the sample population. The model was tested and 80-100% of women expressed satisfaction on the size and fit of the model developed.

Since there are no sizing systems for men and children, the study proposes that studies should also extend to the adult male population and children population of all age groups as they will serve as database for sizing in the Zimbabwean clothing industry. The development of a sizing
system will promote the training of TVET education and women’s clothing industry and
improve the clothing fit for all consumers.

References
May 2012, Selangor, Malaysia.
Gupta, Garg, Arora, & Priyadarshinin (2006). Developing body measurement charts for garment manufacturer
Ujević, D., Rogale, D., Drenovac, M., Pezelj, D., Hrastinski, M., Naranc’ic, S.N., Mimica, Z. and Hrznjenjak, R.

---

1914 Symbolism of Basotho dress artefacts past and present

Mrs B. Pheto-Moeti, Dr J.F. Vermaas & Prof A.J. Pelser, University of the Free State
Mabokangm7@gmail.com

Key words
Dress, artefact, symbolism, meaning, culture, communicate

Introduction
“Dress” has been defined in many different ways (Kaiser 1990:5; Rouse 1989:50; Roach-Higgins & Eicher 1992:1; Damhorst 2008:1; Eicher & Evenson 2015:3), however this study
regards dress as synonymous to clothing which is any tangible or material object connected
to the human body (Kaiser (1997:5). “Dress is a material artefact that reflects one mentifacts
of culture. A material artefact reflects the mentifacts (beliefs, values and attitude of a culture).
Dress as an expression of an individual’s social identities plays a dynamic role in social
interaction and communication. Dress also as a cultural symbol represents a metaphor of
society in transition” (Trollip, 1994). Material artefacts reflect the non-material culture shared
by the members of the society (Eshleman, Cashion & Basirico, 1993:100-101; Kaiser

In many cultures, dress artefacts are designed and worn to communicate meaning. Many of
Basotho dress artefacts that have meaning are disappearing as the culture continues to evolve
and some new dress artefacts are being embraced. Documentation of the meanings of
Basotho dress artefacts is scarce and most materials are written in Sesotho and therefore not
readily accessible. The objective of the study was to determine the knowledge of meaning or
symbolism of the dress artefacts that were used by Basotho and are no longer available and
those that are currently valued as part of everyday life. The research questions addressed
awareness of meanings or symbolism, artefacts that are still valued, perceptions of elderly
and youth, and significance of colour and material of artefact.
Methodology
The research design was mixed methods as it consisted of a quantitative and qualitative component (Creswell 2014:220). The target population was the Lesotho College of Education (LCE) staff and students for both quantitative and qualitative data; and also elderly people in selected villages in selected districts in Lesotho for qualitative data. LCE was selected for study because it serves the population representative of the 10 districts of Lesotho. A sample of 132 staff members and 233 students was randomly selected. Two focus groups consisted of five staff members and seven students. Eleven elderly persons from Ha Mosuoe in Quthing and 13 at Ha Belo in Botha-Bothe were interviewed.

Results
More than 80% of staff and students indicated that mourning attire communicates loss of a family member, selapa communicates a first pregnancy and leqapha symbolises rite of passage from boyhood to manhood. Furthermore, a necklace and a handkerchief are past gift artefacts that communicate love or acceptance when one is being proposed for marriage. More than 60% of staff and students indicated that pregnant women cover the belly with a towel to provide warmth and protection. The findings from the elderly interviews show that thapo or mourning attire comprises of a black shawl, dress and a head cloth (tuku) for the widow and a black band for other members of the family. Selapa which can be pink or red is worn with a seshoeshoe skirt. The findings also indicated that young men went to initiation school wearing ts’ea and mokhahla (skin blanket) and after graduation they wore leqapha and blanket smeared with red ochre (letsoku). More than 70% of students and 50% of staff agree that a yellow seanamarena blanket belongs to Terene group, red letlama to Seakhi or Pula-Bobete, while black letlama is for Seakhi and Terene groups. These particular blankets were associated with Famo music groups found in Mafeteng, Botha-Bothe, Mohales Hoek and Leribe and none in Quthing.

Conclusions and Recommendations
Colour and use contributes to the meaning or symbolism of an artefact. Artefacts were found to be significant as part of Basotho dress and should be preserved. Thapo, leqapha and blanket are among the artefacts that are still in use. Further research is recommended on cultural dress items with meaning or symbolism that have a potential for causing conflict and the meanings and symbolism of colours of artefacts.

References
Key words
Basotho, dress, clothing, symbols, culture, practice, rite of passage

Introduction
The study addresses dress as a noun which is defined as “the total arrangement of all outwardly detectable modifications of the body and material objects added to it.” On the other hand, “clothing refers to any tangible or material object connected to the human body,” (Pheto-Moeti et al., 2018:15). Furthermore, Kaiser (1997:5) proposes that from the first clothing that consisted of the skins of animals, civilisation has resulted in the modern clothing that has replaced traditional clothes. Eshlemen et al (1993:100 -101) have submitted that civilization that had positive aspects on African cultures should not lead to loss of African values and social identity. The Basotho cultural dress practices pertaining to the rites of passage are not an exception to the degradation challenges that have faced other nations. The Basotho, like other cultures, attach meanings and symbolism to their cultural dress practices. Documentation of the meanings of Basotho dress artefacts is limited by language and scope. Segoete (2001), Pheto-Moeti (2005) and Mokorosi (2017) have discussed some Basotho cultural practices related to clothing. Mokorosi (2017) has consolidated archived information on Basotho practices and Matobo et al (2009) focused on the Basotho concept of initiation. Conversely this study specifically attempted to address Basotho dress practices in general as distinct from clothing. The objective of this study was to investigate the meaning and symbolism of Basotho dress practices for rites of passage from a cultural and symbolic interactionist point of view. The study sought to determine symbolism, significance, and value of passage rite dress practices. This study is embedded in the theoretical framework of symbolic interactionism as developed by George Herbert Mead (1863-1931). Symbolic interactionism is the interpretation of meanings that people apply to the world around them and share through social interaction (Tawfiq & Marckett 2017:218).

Methodology
The research design followed a qualitative approach. Data was purposefully gathered from Lesotho College of Education’s (LCE) staff and students in Maseru and elderly people from selected villages in the districts of Quthing and Botha-Bothe. At LCE two focus groups were conducted consisting of five staff members and seven students. Eleven elderly persons from
Ha Mosuoe in Quthing and 13 at Ha Belo in Botha-Bothe were also interviewed. The two districts were selected because Quthing is a district that borders with the Eastern Cape Province of South Africa in the south of Lesotho and has a significant number of the Thembu (Bathepu) that have settled there. In Botha-Bothe in the north of Lesotho, the village of Ha Belo is settled by the Ndebele (Mate bele) people. The two cultures have either adopted the Basotho dress cultural dress practices in relation to the rites of passage or maintained their own.

Findings
The results showed that for Basotho the rites of passage from childhood, adulthood and death require a specific dress. At childhood they wore khoetsa around the neck for identity and protection. The Ndebele observed khoetsa practice while the Thembu did not. In the Basotho culture boys and girls were initiated. The Ndebele initiated only girls and in the case of the Thembu only boys were initiated. Red ochre was important during initiation practice in all three cultures. The marriage dress practice for the bride included a blanket, a dress and a head cloth (tuku) that expressed the practice of hlompho (respect) in all the three cultures. The bride covered the head and shoulders to respect her father in-law and the mother in law did the same for her son-in-law. Basotho had a practice of ho bipisa for a pregnant woman who had to wear a special dress. The Thembu and Ndebele did not have this practice. Pregnant women covered the waist with a shawl or blanket for warmth and respect. When there was a death the widow wore a black mourning attire while the rest of the family members wore a black band (thapo).

Conclusions and Recommendations
In general the importance of the rites of passage dress practices for Basotho and the other cultural groups among them were for the inculcation of values of respect, identity, stage of growth and protection against evil. It is recommended that international conventions related to cultural respect be revisited. Elements of culture in school curricula should also be considered.

References
Matobo, T.A., Makatsa, M. & Obioha, E.E. 2009. Continuity in the traditional initiation practice of boys and girls in contemporary Southern Africa society in Kamlia-Raj (ed) Stud Tribes Triabals 7(2) 105-113
1975 Integrating recent development in textile and design technology with protective clothing in health sector

Ms P. Chitura & Dr B. Mantyi-Ncube, National University of Science and Technology
patiencechitura@gmail.com

Key words
Textile technology, performance textiles, protective clothing

Introduction, problem and objectives of research
Design has long been regarded as an intentional problem-solving action and has become the focal point of events prepared for professional activities almost in every sector (Gurcum, 2017). Performance textiles that protect human from different threats and dangers from environment are in high demand, and the advancement in functionalisation technology together with employing advanced materials have made this an area of research focus. Health workers are likely to face various hazards such as skin diseases and death from chemicals used in pharmaceutical purposes, laboratories, and in food items. This research aims at developing protective clothing using protective fabrics with a functional coating that can prevent the penetration of water, liquids, oil and blood without compromising the wearer. The Design Thinking method will be adopted since it focuses on promoting the well-being of people consisting of a multidisciplinary, collaborative, innovative methodology that seeks to promote solutions for the creation of products and services (Sandra, 2018).

Problem Care givers in the health sector are highly exposed to several health hazards such as skin diseases that may be caused by blood and chemical contacts. It has been observed that the type of material used for caregiver uniforms does not have properties that protect the wearer. Mandy fabric composed of a polyamide chemical source is used in most cases as it provides easy care properties however the fabric allows liquids to penetrate through it easily therefore become harmful to the wearer. The fabric does not have hydrophilic properties and might not be comfortable to the wearer. On the other hand, most health institutions do not consider individuals with Textiles Technology and Design knowledge as an entry point to study in nursing hence the need to highlight the role of Textile Technology and Design in the Health Sector. Is Textiles and Technology Design not equally important as any other learning area? Since learners with textile science background are aware of what different types of fabric can perform and react on different individuals can be useful to health caregivers. In what way is the knowledge of Textile Technology and Design differ from History, Commerce and Geography learning areas?

Objectives
• to establish a relationship between Textiles Technology and Design and health sector
• to design protective clothing for caregivers in the health sector
• to introduce new fashion trends in uniforms worn in health sector
Methodology

Project consists of a systematic plan or method that includes problem solving incorporating ideas, innovation, sketch creation, samples and models to make concrete solutions to problem found. The Design Thinking method focuses on promoting the well-being of people consisting of a multidisciplinary, collaborative, innovative methodology that seeks to promote solutions for the creation of products and services (Sandra, 2018). The Design Thinking method lists three main concepts: design thinking as a cognitive style, as a general theory of design and as a resource for organisations to promote innovative solutions in design, hence suitable and relevant for this study. The new methodologies seek to promote the association of techniques that provide greater reliability to the project process and promote the collaborative creation, co-creation and exchange of ideas, use of theories and the use of tools, (Gurcum, 2017). The data will be collected through research using primary and secondary sources from two health institutions in Bulawayo Province in Zimbabwe. A qualitative approach will be useful for the study. Observational drawing and sketching as external representations of internal concepts will be carried out that includes the use of CAD design software TUKA CAD and AutoCAD (Al- Mousa, 2013).

References

Al- Mousa, N. (2013). An examination of CAD use in two interior design programs from the perspectives of curriculum and instructors. Canada.: Queen's University Kingston.;
2. CONSUMER BEHAVIOUR AND DECISION-MAKING

1946 An integrative model of the influence of materialism on subjective well-being: Mediating role of gratitude, needs satisfaction, power and experiential avoidance

Dr R.J. Tobias-Mamina, University of the Witwatersrand
Rejoice.tobias-mamina@wits.ac.za

Key words
Materialism, centrality, happiness, success, subjective well-being, young adults

Introduction
As much as material items gain social meaning they function as symbols of identity and self-expression. Materialism characterizes the significance of possessions in one’s life. Self-determination theory (SDT) suggests that basic psychological needs for autonomy, competence, and relatedness should be satisfied in order to experience well-being. However, materialism, as a form of extrinsic motivation, may preclude the fulfilment of need satisfaction, and undermine personal well-being. Drawing on the view of SDT, this article examines the predictive relationship between materialism, gratitude, need satisfaction, power, experiential avoidance and subjective well being in sample of university students in Gauteng Province of South Africa.

Methodology
To validate the integrated conceptual framework, primary data were collected from university students in Gauteng Province of South Africa. Structural Equation Modelling (SEM) technique was used to analyse data relating to hypothesized relationships in the model.

Results
None provided

Conclusions and Recommendations
This research shows that feeling of happiness and success can have positive effects on the lives of adolescents in instilling feeling of self-esteem and power and reduces the need to compensate for diminishing self-worth through the adoption of materialistic behaviours and advance well being.

References
Consumers’ knowledge of selected production process claims and the importance of evaluative criteria when purchasing pre-packaged fresh lamb or mutton products

Ms I. Wilken, Dr S. Donoghue & Prof J. Kirsten, University of Pretoria

ina@finbond.co.za

Key words
Subjective knowledge, objective knowledge, production process claims, claims of geographic origin, consumer decision making, evaluative criteria, pre-packaged fresh lamb or mutton products

Introduction
In a South African context, a range of consumer studies have been conducted over the past few years to understand the influence of food labels on South African consumers' purchasing behaviour (Kempen, Bosman, Bouwer, Klein & Van der Merwe, 2011, Prinsloo, Van der Merwe, Bosman & Erasmus, 2012) the specific factors influencing consumers’ decision making pertaining to red meat products (Vermeulen, Schönfeldt and Pretorius, 2015), and specifically consumers’ perceptions about the Karoo region and Karoo Lamb as well as consumers’ willingness to pay for this product of origin (Du Plessis & Du Rand, 2012, Kirsten, Vermeulen, Van Zyl, Du Rand, Du Plessis, & Weissnar, 2012, 2017). Extending these studies, the current study broadens our understanding of the relationship between consumers’ subjective and objective knowledge about production process claims, including grass-fed, free range, antibiotic free, hormone free; and the Karoo Lamb claim of geographic origin, and the importance of specific evaluative criteria when purchasing pre-packaged fresh lamb or mutton, and of the relationship between the knowledge dimensions and willingness to pay more for lamb or mutton with specific characteristics.

Methodology
The study is quantitative, exploratory and descriptive in nature. A cross-sectional survey design involving a self-administered, online questionnaire was used to collect data from urban consumers, aged 18 years or older, who were the main buyers of pre-packaged fresh lamb or mutton at large food retailers. The subjective knowledge tests were based on Flynn and Goldsmith’s (1999) short, reliable and valid self-report measure of subjective knowledge that is applicable to a variety of data collection methods and subject areas. The objective knowledge tests consisted of series of true/false questions that were self-developed based on theory pertaining to the specific claims, including Certified Karoo Meat of Origin (n.d.), Karoo Development Foundation (n.d.) and SAMIC (2015). The importance associated with selected evaluative criteria based on label information and willingness to pay more for pre-packaged lamb or mutton were measured on 5-point Likert-type scales. A respectable research company, recruited respondents by means of non-random convenience sampling in main urban areas across South Africa. A total of 355 useful questionnaires were collected.
Results

The results of this study show that what respondents think they know, i.e. their perception of the nature and extent of their own knowledge, and what they actually know about selected lamb or mutton production processes are two different things, potentially influencing consumers’ search and choice behaviours differently. Knowledge about production process claims therefore manifests in two dimensions: subjective and objective knowledge. Higher levels of subjective knowledge are related to higher importance ratings for free-range lamb, hormone-free lamb, antibiotic-free lamb and Karoo lamb. The higher the subjective knowledge of claims, the higher the importance ratings, implying that the more confident respondents felt about their knowledge of the respective claims, the more important they regarded product label information about the claims. No significant relationships exist between the objective knowledge pertaining to free range, hormone free and antibiotic free and the importance ratings pertaining to free range, hormone free and antibiotic free. Karoo lamb knowledge is related to the importance attached to Karoo Lamb information, with a higher level of knowledge associate with a higher level of importance. Due to intentional marketing in popular media over the last few years, consumers might be more aware of factual information pertaining to Karoo lamb, which would explain their higher importance rating for Karoo Lamb information compared to hormone free, free range, and antibiotic free information. A higher level of subjective knowledge about the specific claims had a positive impact on consumers’ willingness to pay more for lamb/mutton, while objective knowledge was not related to willingness or intention to pay more.

Conclusions and Recommendations

It appears that subjective knowledge could be a better indicator of consumers’ importance rating of evaluative criteria pertaining to lamb or mutton and of their willingness to pay more for lamb or mutton than their objective knowledge. As several lamb or mutton characteristics are credence attributes, labelling can play an important role in increasing efficiency in consumer choice in the lamb or mutton market. Pre-packaged fresh lamb or mutton should be appropriately labelled to target specific consumer groups. However, to facilitate consumers’ interpretation of label information, sound subjective and objective knowledge of specific production processes is needed. One way to achieve this is by using meat labels and advertising together to educate consumers on the various production processes and the various benefits in terms of human health, animal welfare and the environment (production of origin-based meat). The results of the study have implications for the food industry, policy makers, and independent consumer protection organisations.

References

The economic potential for an origin-based marketing and certification system for a meat product in South Africa: Perceptions, preferences, and experiments. IAAE Conference, 18-24.


1960 The Millennial South African consumers’ attitude versus behaviour regarding slow fashions impact on sustainable consumption

Mrs C. Moodly, Dr L. Christie & Dr M. Strydom, Unisa
cheryldene.p@gmail.com

Key words
Millennial South African consumer, slow fashion, consumer behaviour, sustainable consumption

Introduction
The globally relevant billion-dollar industry of fashion is driven by a quick pace, and an ‘out with the old, in with the new’ character, while its consumers are enticed with instant gratification through the rapid fashion cycle (He et al 2017). Unfortunately, the debris left behind by fashion consumption is found in the disreputable waste and toxic effluents from the textile production processes and the large amounts of clothing waste dumped in landfills after they become unusable or unfashionable (Anastasia 2017). It can be understood that the impact of the textile and clothing industry on the environment has been a cause for concern but is beginning to reveal what could be catastrophic results. The consumption of fashion seems to be using up or tainting environmental resources, at too great a quantity and too fast a pace for the environment to replenish them (WWF 2018). In South Africa, waste and recycling co-operatives have experienced a 91.8% failure rate, with only 10% of waste being diverted to recycling (Godfrey & Oelofse 2017).

Movements calling for a minimalist lifestyle, such as VSM, are growing in popularity partly because society is recognising the detrimental effects of consumption (Kennedy et al. 2013). Another movement referred to as the slow movement, progressed into slow fashion. Slow fashion is a fashion system which focuses on the responsible production and consumption of fashion (Brail et al. 2014). In order to understand what role slow fashion plays against a thriving system such as fast fashion, companies must understand what the purchase intention is of each of their consumers since the consumer could potentially alter the course of the fashion industry and the principles that govern their systems. There is currently limited information available pertaining to the South African consumers’ stance on fast and slow
fashion and its impact on the environment. Enviroserv (n.d.) stated that a lack of consumer awareness is one of the many hindrances to the progress of waste matter being dealt with responsibly. This study aims to identify what the Generation Y consumers’ perception is behind slow fashion, as well as to investigate the depth of consumer knowledge regarding the environmental concerns and buyer behaviour regarding the fashion industry products.

**Methodology**

The intention of the study is to retrieve in-depth knowledge regarding the topic, based on the experiences of individuals. This study will therefore utilise a qualitative approach, since it intends to analyse a specific type of consumer’s perception versus their behaviour in relation to slow fashion in terms of sustainable consumption (Denzin & Lincoln 2008:14; Bezuidenhout et al. 2016:173). A case study is therefore suitable to study the matter of slow fashion in relation to sustainable consumption of Millennial consumers in South Africa. This study aims to retrieve in-depth information through the perspectives and opinions of several participants who fall within the context of a slow fashion consumer. The study population is Millennial consumers of slow fashion. Qualitative interviews have been identified as a method of data collection which aims to “see the world through the eyes of the participants. This form of data collection has therefore been used to gain an understanding of the slow fashion consumers’ perception versus their behaviour in relation to sustainable consumption (Creswell et al. 2016: 93). The method used to retrieve the data required will be through face-to-face, semi-structured, open-ended interviews with slow fashion consumers. Content analysis and coding were the systems used to analyse the data.

**Results**

The results revealed that the majority of the participants within the study were exposed to the fashion industry as academics or fashion designers. The consumption practices of most of the participants were motivated by an environmental awareness of the ills of fast fashion and irresponsible practices in the clothing and textiles production industry, as a result of their experience within industry. Their said involvement in the fashion industry also influenced the participants consumption behaviour, in that there was a preference for clothing consumption as a need rather than a want. This is an ongoing study and results are therefore unfolding methodically.

**Conclusions and Recommendations**

The conclusive findings revealed that the most appealing aspect of slow fashion was one of its core values, found in the longevity of the clothing, undefined by trends. Slow fashion does however carry a stigma of overpriced and unaffordable to South African consumers. The influx of cheap imports within the country influences the consumers growing desire for disposable fashion. However, any awareness of the lack of accountability behind fast fashion production practices, environmental damages occurred as a result and poor disposal methods is on the increase. It has been concluded that the greatest tool to inspire conscious clothing consumption practices and to promote slow fashion is through the increase of awareness to the country regarding the realities of both aspects. An increase in awareness, education and transparency in advertising must be encouraged and adopted within a South African context, to promote lifestyle practices that emanate environmental and social and well-being.
References


1964 Infant vaccinations: towards informed decision-making

Ms E. Botha, Prof D. van der Merwe & Prof R. Burnett, North-West University
Eloise.Botha@nwu.ac.za

Key words
Infant vaccinations; information sources; objective and subjective knowledge; risk perception; trust in information sources; vaccination decisions; vaccine hesitancy; values

Introduction
Recent outbreaks of vaccine preventable diseases in South Africa due to reduced immunisation levels (National Department of Health South Africa et al., 2017:22) threatens the sustainability of healthy communities. One factor that contributes to lowered vaccination levels is active anti-vaccination (AV) lobbying which attempts to convince consumers not to vaccinate their children or themselves (Tafuri et al., 2014), despite their claims being fully discredited in numerous studies (Hviid et al., 2019; Yang & Shaw, 2018). AV lobbying is mainly propagated through the Internet and social media. Therefore, consumers searching the Internet and social media for health-related information might be influenced by the excessively available misinformation (Wiley et al., 2017), which may lead to ill-informed decisions (Jiang & Beaudoin, 2016:240). Despite various international studies regarding influences on vaccination decisions, little is known regarding South African consumers’
vaccination decisions and factors that may influence their decisions. The purpose of this quantitative cross-sectional study was to examine the extent to which values, consideration of immediate and future consequences, risk perception, objective and subjective knowledge, and information acquisition influence South African parents / guardians’ vaccination decisions.

**Methodology**

An electronic questionnaire was developed. The scales were compiled from theory and adapted from existing questionnaires. The study was approved by the Health Research Ethics Committee of the North-West University (NWU-00104-17-A1) before data collection took place. The survey was distributed using paid targeted Facebook advertising. Purposive sampling (Palys, 2008:697) was used as respondents had to meet specific criteria to participate in the study. Respondents had to be South African social media users aged 18 years or older, and parents or guardians of children aged 12-23 months. Statistical analyses methods used included descriptive statistics to obtain constructs’ means and frequencies of agreement to the statements measuring the constructs. One way ANOVAS, cross tabulations and t-tests were used to assess differences in between constructs based on demographic sub-groups and vaccination decision. The relationships between the independent and dependent constructs were analysed using correlation. We used effect sizes to indicate practical significance since owing to the non-probability sampling method used. Data analysis was done using IBM® Statistical Package for the Social Sciences (SPSS®) Version 24 software. Construct validity was assessed with convergent validity and by using exploratory factor analysis for the different scales of the questionnaire. Internal reliability was tested with Cronbach’s alpha (CA). The CA obtained for all factors varied between α = 0.65 and α = 0.96 indicating acceptable internal reliability for consumer behaviour studies.

**Results**

Out of 515 respondents who participated, 415 questionnaires were usable. The majority of respondents were white (77% [318/415]), well-educated with post Grade 12 training (71% [296/415]), female (92% [380/415]) and aged 26-35 years (68% [284/415]).

Respondents’ vaccination decision correlated negatively (p < 0.01) with medium to large effect sizes with the factors “physical risk” (r = -.76), “social risk” (r = -.40), “time risk” (r = -.73), “performance risk” (r = -.76), “psychological risk” (r = -.63), “financial risk” (r = -.73), “subjective knowledge” (r = -.3), “use of scientific sources” (r = -.44), and “trust in alternative practitioners” (r = -.44). These correlations indicate that those who perceived high risk, thought they knew more than others about vaccinations, reported that they use scientific sources and trust alternative practitioners tended not to vaccinate their infants. Vaccination decision showed positive correlations (p < 0.01) with medium to large effect sizes with factors “being well-respected” (r = .22), “objective knowledge” (r = .33), “trust in scientific sources” (r = .76) and “trust in social sources” (r = .36). These findings indicated that more respondents who decided to vaccinate their infants put practically significantly more trust in scientific sources. They also tended to value being well respected as important, be knowledgeable about vaccinations and to trust social sources for vaccination information.
Conclusions and Recommendations

Results from this study indicates factors that influence consumers’ decision on whether or not to vaccinate their infants. At least tendencies of associations were evident for certain categories of values, risk perception, subjective knowledge, objective knowledge and information acquisition. Immediate and future consequences of decisions were not associated with the vaccination decision. These results can be replicated and extended with the use of theories and qualitative data. Structural equation modelling analysis which permits the interrelationships between variables can also be used in further studies to improve the prediction of consumers’ vaccination decisions. The resultant model can be used to explain consumers’ decisions in health contexts other than vaccinations.

References


1925 The association between urban consumers’ decision-making and their physical well-being

Dr N. Le Roux, Prof D. Van Der Merwe& Prof C. Wilders, North-West University

neoline.leroux@nwu.ac.za

Key words

Consumer decision-making, coronary heart disease, lifestyle habits, physical well-being

Introduction

Consumers residing in urban environments are faced with various unavoidable stressors such as work pressure, traffic or commuting, along with financial, social, work-family balance and health factors (Gong et al., 2016; Soni, 2013). Despite these stressors, urbanites also have to engage in decision-making on a regular basis to address various needs and desires. To add, should they find themselves in a position to make decisions under pressure, the stress that accompanies decision-making, especially if they do not make informed decisions of higher-
risk products, along with other stressors of an urban environment might be detrimental to their physical well-being. Therefore, uninformed decision-making regarding higher-risk products such as household equipment can result in additional undesired high levels of stress. Longitudinal high-stress levels that are not managed effectively can contribute to lowered physical well-being and an increase of non-communicable diseases. Despite most health-related researchers’ attempts to shed light on well-being in a holistic manner, this study attempts to expand the current view on perceived health risk factors attributing to non-communicable diseases by incorporating a behavioural component namely decision-making in order to contribute to consumer well-being and the promotion thereof. This research, being from consumer decision-making and physical well-being theoretical point of view, accordingly aimed to quantify possible correlations between the manner in which consumers make decision-making and how it correlates with their physical well-being.

Methodology

Forming part of a larger cross-sectional and correlational study, 391 employees from three head offices of a South African national financial organization were recruited during 2016. Respondents had to complete an online questionnaire that formed part of step one of this study, focusing on consumer decision-making styles (CSI model of Sproles and Kendall, 1986, adapted by Potgieter et al., 2013) as well as the consideration of future consequences (CFC scale of Joireman et al., 2012) when purchasing household equipment. Step two entailed collecting subjective and objective physical wellness data from the same respondents from a running wellness study in the participating organization (N=65). Subjective measures included respondents’ coronary heart disease risk index results, of Bjurström and Alexiou (1978), as well as the lifestyle habit index of Belloc and Breslow (1972) that influence general health. The objective measures entailed body mass index, total cholesterol and random blood glucose and systolic and diastolic resting blood pressure which often is markers for non-communicable diseases risk factors. Associations were determined between the decision-making data and the physical wellness data.

Results

Results indicated that the decision-making of respondents regarding higher-risk products such as household equipment might be associated with their physical well-being. Finding furthermore revealed respondents’ overall physical health to be mediocre, although they seemed to resort to informed decision-making styles and future-oriented decision-making. The extent of decision-making correlated on certain factors with physical health, revealing that respondents who tended to exercise more control over the subjective side of their physical well-being by maintaining good lifestyle habits, might also do so in terms of decision-making, even though it might negatively influence their physical well-being at times.

Conclusions and Recommendations

Findings revealed correlations between consumer decision-making and their physical wellbeing, which indicated that behaviour of consumers might contribute towards a better understanding of physical health risk factors that might negatively impact consumers’ well-being. Therefore, this information may be valuable to various role players in the health industry, such as various medical practitioners, wellness managers in the industry and
academia. The novelty of this paper lies in the additional insight provided for an under-researched area of consumer decision-making and the association with physical health in an attempt to improve consumer well-being.

References

1941 Investigating the perceptions and consumption patterns of Bambara groundnuts in rural households of KwaZulu-Natal

Ms N. Shongwe, Prof U. Kolanisi & Prof M. Siwela, University of Zululand
ShongweN@unizulu.ac.za

Key words
none given

Introduction
Bambara groundnut is a legume complete food containing sufficient amount of carbohydrates and proteins and also rich in micronutrients. It is commercially produced in Northern Cape, Free State, and North West provinces, however, in KwaZulu-Natal it is produced in small scale, mainly for domestic purpose. Although legumes have a history of being inexpensive source of proteins throughout the world because of their major role in the fight against malnutrition, their consumption levels remain low, especially in developing countries, including South Africa. Previous research has shown that the utilisation of Bambara groundnut in some parts of KwaZulu-Natal has been hindered by lack of market availability of the crop and lack of knowledge for its cooking methods. Since this crop is domestically grown in some households, it is necessary to document the utilisation patterns. Therefore, this study seeks to investigate the utilisation patterns of this crop as well as perceptions of consumers around Bambara groundnut.
Methodology

For this study, qualitative data were collected using survey questionnaires from 100 households that were selected using purposive sampling procedure. Households caregivers were interviewed for better understanding of the consumption and utilisation patterns of Bambara groundnuts in their households. Households with a vegetable garden or field were targeted. This was followed by a series of focus group discussions involving household caregivers for further exploration.

Results

Results showed that a majority (86%) of the respondents were aware of Bambara groundnuts, however, only (28%) cultivated these for domestic purposes or for personal use. Corn and Bambara groundnut was a favourite snack for most of the respondents, eaten by 42% of the respondents and only 3.5 % preferring a snack with Bambara groundnut, sugar bean and samp. Focus group discussion revealed that respondents were aware that Bambara groundnut is more nutritious than other legumes such as sugar bean and they also perceived it as a healthier option for preventing chronic diseases. Respondents, however, also reported that the availability of this product was limited to those who had access to it. In addition, they were also less likely to purchase it because it is more expensive than other legumes.

Conclusions and Recommendations

Although Bambara groundnuts are known by a majority of adults in KwaZulu-Natal, the utilisation patterns remain limited due to lack of nutritional knowledge, limited cooking methods, lack of accessibility, and a high price tag. Moreover, it remains unpopular among children whose families seldom use it. An education campaign on its nutritional value and preparation methods is therefore necessary to promote the utilisation of this product as an alternative source of protein.

References

1929 Influence of clothing attributes and knowledge of socio-environmentally responsible clothes on customers purchasing behaviour

Mrs N.V. Mollel-Matodzi & Prof A. Mastamet-Mason, Tshwane University of Technology
Nailalmollel@gmail.com

Key words
Socio-environmentally responsible clothes, fast fashion clothes, clothing attributes, knowledge, customers

Introduction
Global warming is the increase in global temperatures caused by societal processes and practices (Climate reality project, 2016; Kennedy & Lindsey, 2015). The overuse and abuse of natural resources in the production of fast fashion clothes has resulted in the Textile and Clothing Industry (TCI) being named as one of the industries that contribute of global warming globally (Anguelov, 2016; Ozek, 2017). Fast fashion clothes are clothing trends that change rapidly, often low priced and manufactured in low quality non-durable fabrics (Strähle & Klatt, 2016:123; Anguelov, 2015: x). Fast fashion clothes have both environmental and social harm in their production, use phase by customers and disposal phase (KEMI, 2014: 38; DeHaan, 2016). Some of the environmental harm of fast fashion clothes is associated with the use of harmful chemicals from fibre to fabric production of synthetic and natural fabrics (Whitehead, 2014). The social harm associated with fast fashion clothes are workers’ exposure to harmful chemical, poor working conditions and compensation (Anguelov, 2015:3; Allwood et al., 2006: 14). There’s an upsurge of fast fashion in SA (Slingerland, 2018), this indicates that South African customers choose to purchase fast fashion clothes. Sustainability is the solution to reducing global warming effect (Sustainable Developments Commission, S.a) caused by the TCI. Social responsibility is the meeting peoples’ fundamental needs by protecting and promoting their human rights in all areas of life such as education, employment and living conditions (UNAC, 2013). Environmental responsibility is a state of equilibrium between people and the environment; it enables people to meet their needs while preserving the environment (Morelli, 2011; UN, 2008). One of the ways in which the TCI can protect the environment and society is through the production of socio-environmentally responsible clothes. Socio-environmentally responsible clothes are clothes that are manufactured in a manner that promote a healthy environment and society (Gwozdz, Nielsen and Müller, 2017:3). Customers have the power to reduce the negative socio-environmental impact caused by the TCI by purchasing socio-environmentally responsible products (Veleva & Ellenbecker, 2001: 128). Identifying customers’ desired clothing attributes has been shown to aid in designing effective products (Rai, 2012:1). In order for that to happen, fashion designers need to incorporate customers’ desired clothing attributes at the sourcing, designing and manufacturing stage of supply chain operations. The most common clothing attributes are the look, the feel, durability and price (Carpenter & Moore, 2010; Niinimäki, 2010). There are two opposing views regarding customers purchasing behaviour. The first view is that customers are more likely to purchase socio—environmentally responsible clothes if they are aware of socio-environmentally responsible matters (Brosdahl, 2010; Niinimäki, 2010). The
second view is that awareness of such matters does not necessarily influence customers purchasing behaviour (Malepa, 2014).

This paper explores customers’ desired socio-environmentally responsible clothing attributes. This study also explored the influence of knowledge on socio-environmental on customers purchasing behaviour.

Methodology

A quantitative research design method using online survey was administered on 340 participants but only 305 responses were viable. Participants were selected purposively through social media posts by social influencers and the researchers’ contacts.

Findings

Majority (85%) of the participants were female. This skewed representation has influenced the findings of this study and can be attributed to the fact that women tend to participate in surveys than men (Eckman and West, 2016: 483). Findings of this study indicated that participants were more likely to purchase socio-environmentally responsible clothes if their look and feel resembled the look and feel of mainstream clothes. Findings of this study also indicated that majority of the participants rated durability as the most important attribute yet a few of them purchased socio-environmentally responsible clothes due to that attribute. More than half of the participants indicated they purchase the clothes when they are on special offers. Regarding the influence of knowledge on purchases, majority of the participants indicated that they occasionally purchase the clothes because they are aware of their socio-environmental benefits. Findings also indicated that there was association between age and purchases made based on knowledge of the benefits of the clothes.

Conclusions and Recommendations

Findings of this study revealed that a combination of raising awareness and, improving the look, feel and price attributes of socio-environmentally responsible clothes are crucial in improving customers’ purchasing behaviour. Insights from this research can aid in the effective design and production of multifaceted socio-environmentally responsible clothes. It is recommended that fashion design entrepreneurs either invest in raising awareness or expand their socio-environmentally responsible awareness in order to attract new customers and maintain current customers. It is also recommended that a modification and balance of look, feel and price of socio-environmentally responsible clothes be implemented in order to increase customers purchasing behaviour.

References


2001 Consumers’ awareness on food safety, quality and willingness to pay for certified food products

Mr K. Nkwane & Prof I.C. Kleynhans, Tshwane University of Technology
keaking2@gmail.com

Key words
Consumers, food safety, quality, knowledge, willingness-to-pay

Introduction
Foodborne disease is annually the cause of large numbers of deaths. To deal with the foodborne diseases challenges, governments have to put in place food control systems. Food safety and quality regulations come with costs for governments, industry stakeholders and consumers. Governments endure the accountability to monitor and implement the standards. In order to enforce the standards, government has to increase its resources. Industry endures the major responsibility to implement the regulations and should devote the means for personnel time, processes and systems, training and machinery and tools necessary to put the standards into effect (Gardner, 2016). Eventually, customers will suffer the expenses for the regulations via taxes to pay for the state control authorities’ operations and via high food prices. The overall objective of the study was to assess consumers’ awareness on food safety, quality, and willingness-to-pay for certified food products.

Methodology
A quantitative exploratory survey design was employed for gathering data. A sample size of 132 respondents was drawn using a non-probability method in the form of convenience sampling. Data was gathered from eligible participants using a self-administered questionnaire. The variables used in the questionnaire were reformed from similar studies. A 5-point Likert scale was used to test the knowledge of the consumers. A Visual Analogue Scale of 1 to 10 tested factors that influence the respondents’ willingness-to-pay. The SPSS statistical software was utilised to analyse the data. Frequency tables, summary statistics, histograms, independent T-tests, and univariate analysis of variance (ANOVA), were used for data analysis. The interpretation was performed at \( \alpha = 0.05 \). The Cronbach Alpha test was used for guaranteeing reliability and internal consistency.

Results
The major outcomes of the research discovered that consumer knowledge and awareness is poor on foodborne illness causing organisms and factors that may cause foodborne illnesses. Another key finding was that: expressions such as “best quality”, “quality certified”, “certified organic”; properly labelled food products; and brands were most influential when coming to consumer willingness-to-pay for food products. Only 38.7% of respondents agree to some extent that they understand all information on food product labels. Consumers are prepared to spend more money for any indicators that could add to inform them about the safety and quality of food products. Level of education, income and age among consumers influenced the consumers’ awareness and knowledge on food safety and quality. Factors such as product

51
packaging and presentation, proper labelling, and information on packaging has great prospect to influence consumer’ willingness-to-pay for food products.

**Conclusions and Recommendations**

Awareness and access to information would provide consumers the platform to raise complaints and in turn force food producers and processors to raise their standards. Improved food safety is extremely appropriate for citizens and food certification is helpful for consumers in a developing market like South Africa. Hence food certification warrants support from all role players in the food value chain. Government regulators and food inspection agencies must play a significant role in the execution and control of food regulations and in the distribution of information and knowledge concerning food safety and quality to citizens. The study outcomes provide food producers, food processors, and sellers of food products with evidence that can be valuable to expand their understanding about the factors influencing consumers’ purchase decision, and therefore imparting valuable understanding to aid the businesses strategy of action.

**References**

3. EDUCATION, TEACHING AND LEARNING

1938 Perceptions of Consumer Science teachers and teacher educators regarding the adequacy of training for primary school Consumer Science teachers, ESwatini

Ms N. Mndzebele, Dr P. Musi & Prof P. Zwane, Southern Africa Nazarene University
futhimndzebele@yahoo.co.uk

Key words
Adequacy, Consumer Science, pre-service teacher education, primary school consumer science teachers, quality education

Introduction
Teacher quality greatly depends on the quality of pre-service teacher education received (Eret-Orhan, Ok & Capa-Aydin, 2017). Consumer Science is one of the subjects taught in schools that requires specialised training, and teachers of high quality. The technical nature of the subject requires teachers who are well prepared to relate to an increasingly diverse student clientele (Dainty & Su, 2011). Literature reveals that while many countries are making improvements in their education systems, this does not last long due to lack of research underpinning the need for such improvements. Eret (2013) lamented that there is a mismatch and a gap between what the teachers are trained in and what they are expected to do in the field of teaching. Jerotich, Kurgat and Kimutai (2017) assert that teacher preparation in most institutions is remote from the realities of the school. The teachers, according to Cerovic, Radisc and Stankovic (2015), often lack competencies in handling some of the tasks they are required to do. This eventually leads to the lowering of the quality of education and it also weakens the performance of students in the subject. In most countries there is limited research in the area of teacher education (Eret, 2013). This is also the case found prevalent in the Kingdom of ESwatini. The study therefore assessed the perceptions of Consumer Science teachers and teacher educators regarding the adequacy of pre-service training for primary school Consumer Science teachers. The study was framed by the Transformative Model of Pedagogical Content Knowledge by Gess-Newsome and Lederman (1999). The framework was used to analyse the findings from the survey, interviews conducted and documents analysed, in determining if the training offered to the primary school Consumer Science teachers was adequate. The elements for an adequate Pedagogical Content Knowledge were considered, which helped in identifying gaps.

Methodology
This was a mixed method research which employed both quantitative and qualitative means of data collection. A total of 118 teachers from selected schools in the four regions of ESwatini and eight (8) teacher educators from the three main institutions training Consumer Science teachers participated in the study. Three (3) methods of data collection were used, those were, survey questionnaires, semi-structured interviews and document analysis, in which a
comparison rubric was developed. The reliability of the questionnaires was found to be 0.90 Cronbach’s alpha. The quantitative data were analysed using descriptive statistics, while qualitative data were analysed using thematic analysis. Information from the documents was compared using qualitative comparative analysis.

Findings

The findings indicated that the training offered to primary school Consumer Science teachers in the Kingdom of ESwatini was perceived to be inadequate. The inadequacy was associated with infrastructure, teaching resources, enrolment, subjects taught, time allocated to the subject, the structure of the subject, teaching practice and selection procedures of students. Both the teachers and teacher educators believed there was need for improvements in adequacy in terms of infrastructure, as this is a practical subject that requires specialised laboratories, classrooms and other facilities. The findings indicated that the challenge is made worse by the issue of high enrolment in some of the teacher education institutions which resulted in teachers being exposed less to practical work than theory thereby compromising the teachers’ competence in most of the subjects’ skills. The findings also revealed that the adequacy of the training received was greatly affected by the inability of the teachers to do teaching practice in the subject in schools which makes them unable to put theory into practice. On the whole, there was need for teacher education to improve on aligning the curriculum with the needs of the teachers.

Conclusions and Recommendations

The findings concluded that indeed there is the gap in training between what is taught in teacher education and what is required by Consumer Science teachers in the schools. The pre-service education offered to primary school Consumer Science teachers was not adequate. It was therefore recommended that institutions training primary school Consumer Science teachers should align their curriculum with the needs of the teachers and there is the need for close monitoring in all institutions training teachers.

References


Mapping lecturers’ teaching and learning expectations of first-time Hospitality Management students in higher education institutions

Ms C.M. Els, Dr T. Nyathela & Mr T. Molose, Cape Peninsula University of Technology
carmenels@yahoo.com

Key words
Lecturers’ academic expectations, first-year Hospitality Management students, higher education institutions, Cape Town

Introduction
Lecturers are representatives of the institutions and have hold their own set of expectations for their students, which set the standard for student academic success (Martin, 2010: 1-2). It is a common complaint among lecturers that most of their first year’s students do not prepare or participate in class activities nor succeed in the first six months after registration (Rausch & Hamilton, 2006: 317). There is very limited research done that focuses on hospitality management lecturers in South Africa and more specifically in the Western Cape. This study will explore and map out lecturers’ teaching and learning expectations of first-year hospitality management students in higher education institutions in the Cape Metropolitan region.

Methodology
An interpretivist research paradigm was adopted in this study. Eight semi-structured interviews were conducted with academic lecturers from both, public and private institutions offering hospitality management programs in Cape Town to explore the teaching and learning expectations of lecturers. A qualitative approach was used for this study. Convenience sampling was used for data collection from the lecturers who gave consent to participate in the study. This involved the collection of data by interviewing eight first-year academic lecturers as research participants and analysing this data.

Findings
Findings showed that the most common expectations which lecturers believe would contribute to student’s success rates is orientation, class attendance, class participation, class interaction and being prepared for class. According to the lecturers, first-year students need to attend orientation not only to meet other students but also form lifelong friendship as their academic success can be influenced by either their friends and/or other students around them, which they can ask for assistance regarding their studies (Valeeva, Poldin, Yudkevich, 2014:1). Furthermore, findings indicate that lecturers expect the students to attend all their academic classes, noting that if they do not, they may fall behind or even miss a whole module that might not be discussed again, which by consequence will impact their academic success. Lecturers also expect students to be prepared for every academic class so that they are enabled to participate and interact in class. That way, lecturers will be able gauge if students understand the work or not.
Conclusions and Recommendations

This paper concludes that, beyond attending academic classes, lecturers have other expectations such as participation, interaction and preparation for academic classes. First-year orientation was regarded as the most beneficial as it involves explaining the academic programme, rules, regulations and expectations of lecturers. This therefore makes this study one of the rare initiative studies in the Cape Metropolitan region.

Based on the results, the recommendations are as follows: students should be encouraged to attend orientation programs; Students expectations must be established at first-year level as this might minimise the dropout rate and other challenges which students face; various institutions should come up with strategies to encourage and ensure that students attend all academic classes, which will be beneficial to the student, as they can miss out on so much, because every class is different from the rest. By missing one academic class, they will lose all the information, communication and language skills from that day’s class.

References

thereby, making contributions in the discipline through assuming various jobs in CS specialised areas (Zimmerman, 2015). The variety of available occupations requires students’ awareness of their real possibilities and careful consideration to their choice (Vasiliu & Corina, 2014, p. 700). Students’ awareness on available careers in CS are important factors in career choices, hence making peer pressure, and fear of the unknown less significant. Given that in Swaziland most schools have the least numbers of male students in HE; this concern of low enrolment created a need for conducting the study. The study results would be helpful for the students career guidance teachers, HE teachers, parents, and Head teachers in facilitating right career choices.

Methodology
A descriptive research design study was used with the main purpose of eliciting strategies to attract more male students into the subject; and the main objectives of the study being (a) to determine reasons of low enrolment of male students in HE; and (b) to determine strategies to improve the enrolment of males in Home Economics. The study was limited to HE teachers in Manzini Region. Systematic sampling was used to select 26 schools from 35 schools with a sample of 60 HE teachers obtained.

A questionnaire consisting of close-ended and open-ended items was designed based on study objectives for data collection. Experts in the Department of Consumer Sciences, Luyengo Campus checked the instrument for content and construct validity. For reliability Pilot-testing was conducted through a school not part of the study and a coefficient score of 0.74 obtained. Data were collected through a self-administered questionnaire wherein respondents were asked to rate their responses using a six-point Likert scale rating from a scale of 1=strongly disagree (SD) to 6=strongly agree (SA). The Statistical Package for Social Sciences (SPSS) Version 20 was used for data analysis to compute means, frequencies, percentages, standard deviation according to the objectives of the study.

Results
Respondents’ demographic profile showed 98.3% (59) female teachers versus 1.7% (one) male, this concurs with Egun (2008) who stated that there are less male teachers in CS. Dlamini (1999) confirmed on shortage of male teachers in CS as another problem for male students due to failure of female teachers to effectively convey specific topics relating to males (e.g. growth and development). Furthermore, shortage of male teachers could be a contributing factor to low male students’ enrolment into HE classes. Results of selected schools indicate that, in 2012 male students enrolled in HE classes ranged between five (18%); 11 schools; and four (25%) in 15 schools, and with the lowest being 0 (1.7%) etc.

Based on the Likert-scale rating of 6=Strongly agree, and 1=Strongly disagree, study results showed that most teachers agreed that Swazi culture greatly influenced male students’ enrolment in HE; and that, ‘Swazi culture implies that only girls spend most of their time doing domestic tasks’ (M=5.13; SD=0.97). In support of this Brown (2003) indicated that the attitude and expectations of parents, families and peer groups reinforce stereotypes of appropriate subjects (e.g. in early childhood aspects of play, girls are expected to play with dolls and boys with cars, and males are expected to have an interest in science and technology). Teachers agreed with statements (i.e. 'low numbers of male teachers in HE has an effect on choosing the subject' (M=5.10; SD=0.81); 'males are discouraged by peers from choosing the subject'
(M=4.73; SD=1.36) etc. with an overall (M=3.74; SD=1.35) for low enrolment of males in HE. Pertaining to job opportunities teachers disagreed that HE does not offer job opportunities for males (M= 2.05; SD=1.21).

Results on improvement of male enrolment in HE showed teachers agreed with all strategies with an overall mean (M=4.97; SD=0.90), and with the statements ‘Home Economics teachers should encourage males to choose Home Economics’ (M=5.25; SD=0.77); ‘Career guidance teachers and parents should encourage males to choose Home Economics’ (M=5.43; SD=0.81; and that ‘head teachers should make Home Economics a compulsory subject’ (M=3.50; SD=1.59).

From the strategies suggested by the HE teachers, the involved parties (e.g. Head teachers, Ministry of Education, parents and HE teachers) were all to work together so as to help increase enrolment of male students. Results indicated that implementation of agreed on strategies by Career Guidance teachers, parents, HE teachers, and Head teachers could encourage males to choose and enrol into HE courses. Furthermore, bringing awareness of the importance of the subject could improve low enrolment in schools. These results concur with the Yorkshire Times (Anonymous, 2012) which indicated that teachers are the biggest influence on student choice of careers. HE teachers indicated that parents should involve boys in household tasks and also encourage them to choose HE subject, as parents have a major influence on students’ choice of programme. Pertaining to teaching and learning, results showed that HE teachers should give attention to male students as teachers influence career choices of students.

Conclusions and Recommendations

Results indicated the importance of raising awareness to male students on the importance of HE as a career choice as well as encouraging them to enrol into the subject. Among suggested strategies of increasing male students’ enrolment were: Head teachers to introduce HE to boys’ schools; Career Guidance teachers, parents and HE teachers should encourage males to choose HE. Recommendations are that Career Days could be organised to market the subject and attract both boys and girls to enrol in the subject.

References

1966 Enhancing student’s employability skills beyond the classroom

Dr M. Du Preez, Dr L. van der Merwe & Dr S. Kruger, North-West University
Minnet.dupreez@nwu.ac.za

Key words
Consumer sciences, employability, skills, graduate competencies

Introduction
University students’ theoretical knowledge is constantly tested. However, the typical workplace of Consumer Science graduates is competitive, interactive and a fast-paced environment, demanding employees to have more than just theoretical knowledge. Employability skills, also known as competencies or soft skills are vital to surviving this ever-changing work environment. However, acquiring these skills could be challenging. Research proposes the use of a variety of interactive teaching strategies including problem-based learning, active learning and flipped classroom approaches, implemented by using a variety of methods such as group assignments (Bjorner & Kofoed, 2013; Brooks & Simpson, 2014; Kong, 2014). Although these methods have been proven to increase certain skills, the question arises of whether or not there is more that can be done to enhance employability skills acquisition including out of class methods for example committee work and internships (Brooks & Simpson, 2014).

Methodology
Three participant groups (N=205), including Consumer Science lecturers (13), final year Consumer Science students (91) and Consumer Science graduates (101) voluntarily completed a questionnaire survey to determine how students can attain certain vital employability skills. To ensure a maximum response rate, electronic questionnaires were mailed to lecturers and graduates and students received hard copy questionnaires. Eleven employability skills (as clustered by Singh & Singh, 2008) were presented to the respondents and they had to choose between different options of how students can obtain these skills. These options were selected by reviewing relevant literature regarding skill acquisition (Brooks & Simpson, 2014; Herok et al., 2013) and included group assignments, oral presentations, literature studies, being part of different campus committees or part-time jobs or internships. The option “other” could also be chosen where they could indicate any other methods to enhance these skills. Statistical analysis was done for quantitative data. Themes and categories were generated for the open-ended questions by using descriptive words for coding.

Results
The three participant groups gave similar ratings and results indicated that group assignments, being part of campus committees and work experience is the most efficient ways to increase employability skills. Respondents indicated that working in groups teach students a variety of skills for example communication, teamwork and problem solving skills. Data from open-ended questions confirmed the importance work experience and campus
committees have on increasing these skills. Although all three groups indicated the importance of committee work, lecturers rated it the highest for each skill. This could be due to the fact that they could compare skills of students taking part in committees. Personal life experience, travelling and participating in sports also emerged from findings as a positive influence on most of these skills. Respondents identified that there is a variety of short courses which can increase specific employability skills, however, students first need to realise which skills are important and which skills they lack.

Conclusions and Recommendations

Employability skills are a necessity for the 21st century consumer science graduate. These skills can be enhanced by working in groups, being part of committees and getting actual work experience. However, it is important that students must realise which skills they are lacking and make a personal effort to enhance these skills. By effectively obtaining the needed employability skills, students’ employability can be increased, enabling them to thrive in the ever-changing, competitive work environment.

References

Education Sector Strategic Plan 2016 – 2020 (ESSP) includes a recommendation by stakeholders that “The school system should prepare learners with knowledge and life skills to engage effectively in the growth of the nation” (Republic of Zimbabwe, 2016:25).

A brief overview of the ‘O’ Level syllabus for Home Economics in Zimbabwe indicates that each of its three sub-areas contributes to the attainment of the stakeholders recommendation mentioned above. For example, Fashion and Fabrics “develops skills for self-reliance” (ZIMSEC, 2012:5), and aims to develop “critical and analytical skills in solving problems” (ZIMSEC, 2012:6). Food and nutrition aims to “develop skills that encourage conservation of time, food nutrients, fuel and other resources in the planning and preparation of balanced meals” (ZIMSEC, 2012:16); and Home Management aims to “develop a self reliant, productive person through the skills and knowledge acquired in the study of nutrition, food preparation, fibre and fabrics, parenting, consumer education, home and community” (ZIMSEC, 2012:27). Home Economics therefore has significant potential to contribute to the preparation of learners with several skills for life, as well as the world of work. Despite this potential, Home Economics has not always been held in high regard, probably because people outside the profession do not appreciate the value of the subject (Manwa, 2018:94). The strengths of this subject needs to be explored and emphasised to bolster the subject’s perceived value. To provide comparative contextual information, the O-Level syllabus for Home Economics in Zimbabwe was therefore benchmarked to the Consumer Studies curriculum of South Africa, a neighbouring country. South African Consumer Studies developed from Home Economics and is considered the subject that is most comparable to Home Economics in Zimbabwe (Chamisa, 2005). The purpose of the investigation was to conduct an in-depth analysis and benchmarking of the ‘O’ Level syllabus for Home Economics in Zimbabwe with the Consumer Studies curriculum of South Africa, to identify the strengths within the formal policies for these two subjects. These strengths could then be used to bolster the perceived value of the subjects outside the profession, in particular expanding opportunities for more learners to benefit from the learning therein to prepare them for life and work.

**Methodology**

An existing and validated curriculum analysis instrument (Umalusi, 2014) was employed to conduct structured document analyses. Teams of researchers, who are all experts in the field of Consumer Studies and/or Home Economics, analysed each country’s curriculum separately. Several qualities of the intended curriculum were analysed, such as the broad curriculum design, weighting and sequencing of topics, and depth of content (Umalusi, 2014:42). In addition, the analysis particularly focused on identifying instances in the policies that unambiguously could contribute to preparing learners for life and work. The researchers were in regular contact to ensure coder agreement.

**Findings**

The curriculum for Home Economics and Consumer Studies have similar subjects embedded in them though subject titles and content taught shows slight differences in depth. Both the Home Economics and Consumer Studies curricula teach theoretical and practical aspects of food and nutrition, clothing and textiles, entrepreneurship, consumerism, design, and sustainable development at slightly different levels of breadth and depth.
Conclusions and Recommendations

The curriculum documents used in Home Economics in Zimbabwe and in South Africa have several identified strengths particularly in subject content. The subject content can still be augmented by including best practices garnered from other curriculum documents of countries in the Southern African region. However, there are gaps in the curriculum documents particularly relating to the pedagogical knowledge and assessment for the sound preparation of learners for the world of work. There is need to engage learners fully in the learning process so that they become creative and enterprising in the use of locally available resource materials and technologies thus acquiring skills for self-sufficiency.

References

1973 Benchmarking the Botswana Senior Secondary Home Economics syllabus with the South African Consumer Studies curriculum: Insights for improvement

Dr A. Du Toit, Dr S. Trivedi, Dr K. Kgosi & Dr K. Masoloko, North-West University
dutoit.adri@nwu.ac.za

Key words
Benchmarking, Botswana, Consumer Studies, curriculum, education, Home Economics, syllabus

Introduction
Home Economics and Consumers Studies curricula often share similar content and aims and both subjects can contribute valuable and important learning and skills development in learners’ schooling (Brandon, 1994:36; Du Toit & Kempen, 2018:188; Umalusi, 2014:34).

Home Economics was introduced as a subject in Botswana in the early 1920s, when education development was implemented through a partnership between the colonial government and missionaries. Since its introduction the subject have undergone several changes – not only in name, but also regarding content and structure – including those brought about by the major educational philosophy reform in 1994, which had the purpose of improving the quality of

Following a similar pattern, Home Economics was introduced in South Africa – a neighbouring country to Botswana – in the early 1900s. South Africa also experienced major educational reform in 1994 to improve and change education. The reform included changing the name and focus of Home Economics to Consumer Studies, which focuses more on consumers than on ‘the family’, as was the case in Home Economics (Umalusi, 2014:34) and Consumer Studies is also offered as an optional, stand-alone subject in South African high schools.

The rationale for the significant curriculum reform in Consumer Studies was to better align the South African subject to similar subjects internationally (Ngwenya & Shange, 2019:2). The question however remains if this goal has been attained. One possible solution would be to benchmark the South African Consumer Studies curriculum with that of similar subjects (such as Home Economics) other countries to identify best practice, or suggest areas for improvement. It made sense to start by investigating a neighbouring country such as Botswana, in which the development of Home Economics paralleled that of the subject in South Africa.

The purpose of the investigation was to conduct an in-depth analysis and benchmarking of the Secondary Home Economics curriculum of Botswana with the comparative Consumer Studies CAPS of South Africa. The aim was twofold: to identify the strengths and potential areas for improvement within the curricula for these two subjects; and to generate knowledge which could be utilized to develop recommendations to advise and support stakeholders in enhancing the existing curricula.

Methodology

Structured document analyses, using an existing and validated curriculum analysis instrument (Umalusi, 2014) were employed. Teams of researchers, who are all experts in the field of Consumer Studies and/or Home Economics, analysed each country’s curriculum separately. The instrument was used to analyse several qualities of the intended curriculum, such as aims/objectives, broad curriculum design, weighting of topics, depth of content and sequencing of topics, to name but a few (Umalusi, 2014:42). Subsequently the two sets of analyses were compared and interpreted against the background of national curriculum aims, informed by the combined experience of the two teams, to develop the benchmarking.

Findings

Benchmarking indicated strengths and areas for improvement in both the curricula, but that there is suitable alignment between the two. Some of the most significant findings were that Home Economics is introduced into the Botswana curriculum much earlier than in South Africa, so that learners can start benefiting from the valuable learning in the subject much earlier. Both sets of curricula also include noteworthy entrepreneurship education content, which contributes to the needs of Botswana and South Africa to reduce unemployment. Several areas for improvement were also noted, for example in the form of missing but contemporary content, such as the Botswana curriculum not addressing the needs of differently abled people regarding clothing or interior design, or the South African curriculum not covering labour saving devices.
Conclusions and Recommendations

There is much to learn from both the Botswana Home Economics and the South African Consumer Studies curricula. Insights gained were used to develop recommendations for pruning redundant content and structuring and including other contemporary content. The recommendations are based on the current social and economic needs of both these countries and will better prepare learners for their everyday lives, as well as for their future careers.

References

A critical review of assessment techniques used during teacher training in Home Science Education in Kenya

Dr N.L. Sempele & Dr O. Ariya, University of Eldoret
sempnaire@gmail.com

Key words
Home Science education, assessment techniques, teacher training, Kenya

Introduction
The aim of teacher education is to train teachers who have relevant knowledge, skills, values, attitudes and the ability to identify and deliver the curriculum needs of primary school learners (ROK, 2015). Teacher education is crucial in ensuring the maintenance of quality and relevance of education (Kafu, 2014; Mwaka, Nabwire & Musamas, 2014). One important component of teacher training is assessment. According to Otunga (2015), the success of a curriculum is evaluated at two levels: the programme level and instructional level. The two levels are not mutually exclusive since for any authentic evaluation to take place, the two levels of evaluation must be considered as fundamental parts. Programme evaluation looks at the curriculum in totality. The evaluation includes all components of the curriculum, their interactions and their impacts. Instructional assessment on the other hand is narrow and specific. It focuses on the progress of individual learners in terms of increased knowledge and understanding or development of attitudes and skills. Therefore, instructional assessment
forms an integral part of programme evaluation. Home Science is one of the technical and vocational subjects offered during teacher training in Kenya. Its main objective is to promote self-reliance and improve the quality of life of its students, their families and immediate community (KIE, 2017; Nyangara, Indoshi & Othuon, 2010; Sempele, Natade & Otunga, 2018; Serem, 2011). Instructional assessment in Home Science during teacher training is done both internally and externally. Currently it takes three forms: continuous assessment, a final examination and assessment of teaching practice (KIE, 2004). This study sought views regarding the frequency with which Home Science tutors use different techniques to assess the extent to which teacher trainees have acquired new knowledge, skills and attitudes and how these techniques affect the achievement of the general objectives for Home Science Education in teacher training. Further, the study sought teacher trainees’ views regarding their preferred mode of assessment during training. Kenya is in the process of reforming its education system; hence these findings will inform decisions made regarding instructional assessment in Home Science Education during teacher training.

Methodology

Mixed methods research approach and questionnaires were used to collect the data required. This approach was preferred because it provides a comprehensive understanding of the research problem by allowing collection of both quantitative and qualitative data thus addressing the inefficiencies of either method (Creswell, 2014). The convergent parallel mixed methods strategy was used to collect both forms of data concurrently. Given its expansiveness, the study was embedded in a cross sectional survey research design. Three hundred and forty eight trainees from teacher training colleges spread all over the country took part in the study. Questionnaires with both closed and open ended questions were used to collect the data.

Results

Results obtained from teacher trainees indicated that Home Science tutors preferred using end term examinations, continuous assessment tests, oral questions, quizzes, group reports, practical work, project work and field trip reports, in that order, to assess trainees. Regarding the extent to which this contributes towards meeting the objectives of the Home Science Curriculum, respondents agreed that assessment techniques used by Home Science tutors are adequate and that tutors use a variety of them to a great extent during instruction. The simple regression analysis result of (β1=0.342, p=0.000) at 95% confidence level showed a significant relationship between assessment techniques and achievement of course objectives. Moreover, a majority of the trainees opined that they would prefer being assessed using continuous assessment tests (CATs) and the final primary teacher education (PTE) examination only rather than the current practice that uses CATs, mid-course, mock and PTE examinations for teacher trainees’ evaluation.

Conclusions and Recommendations

The study concluded that the use of end term examinations was the most popular technique for teacher trainee’ evaluation. Further, trainees prefer sitting for continuous assessment tests (CATs) and the final primary teacher education (PTE) examination only. Results also showed that techniques used for assessment in Home Science Education significantly
contributed towards achievement of the general course objectives. The study recommends that further research be done to establish whether it is necessary to continue using the current modes of assessment or revert to the most preferred modes by teacher trainees. The main focus should be to ensure that assessment techniques in Home Science Education address curriculum objectives so as to facilitate curriculum improvement.

References

1982 Insights derived from a curriculum co-development project for sustainable clothing and textile undergraduate courses

Dr L.S. Khoza & Dr N.C. Sonnenberg, University of Maryland Eastern Shore
lskhoza@umes.edu

Key words
Sustainability, clothing and textiles, curriculum co-development, teaching and learning, globalization

Introduction
Today’s student studying textiles and apparel must accumulate the necessary skill-set, knowledge and understanding to effectively deal with the product from initial fibre to final disposal. The textile and apparel supply chain is complex involving extensive design, marketing and merchandising activities, all of which significantly affect the environment when sustainable practices are not utilized. The goal of sustainability then, is to create a system that supports minimal environmental impact and greater social responsibility when consuming textiles and apparel products. In this regard, the Human Ecology Department’s fashion-merchandising program at the University of Maryland Eastern Shore (UMES) and Clothing Retail Management Program in the Consumer and Food Science Department at the University
of Pretoria (UP) complement each other’s missions. Both departments seek to prepare globally competent students who are able to make decisions when consuming apparel goods, in particular applying sustainable practices utilizing practical and innovative technologies, while simultaneously wisely managing resources in diverse contexts and contributing toward the quality of life for individuals in diverse communities. With the above in mind, this paper reports on a curriculum co-development project that was embarked on by UMES and UP collaborators to enhance and strengthen sustainability in existing clothing and textile curricula.

Methodology
To accomplish the envisaged curriculum co-development outcomes of this project, three phases were proposed: In phase one, the collaborators developed a framework to establish the project parameters including an assessment of existing curricula to determine relevancy in terms of current sustainability practices. During phase two (which was undertaken in South Africa, mostly at the University of Pretoria from late July to mid-August 2019) the collaborators reflected on their assessment and met with faculty of other southern African institutions that offer textile and apparel courses to discuss various perspectives on teaching sustainability and developing a globally infused model on sustainable clothing practices. In addition, a workshop was hosted in collaboration with SAAFECS and funded by the Carnegie African Diaspora Fellowship Program (CADFP), during which 28 participants from ten different tertiary institutions gathered to offer insight into the topic at hand. Following the completion of activities in South Africa, the collaborators are currently involved in phase three of the project that is focused on disseminating results to the respective program chairs for course description updates, as well as preparing findings for publication and presentation. This phase will also include the establishment of a continuation plan and feedback reports to be shared with others.

Results
Within the limitations and scope of this paper, it was deemed appropriate to report on insights derived from the workshop that was hosted in collaboration with SAAFECS and the CADFP as part of the second phase of this project. During workshop discussions, it became apparent that more impetus should be directed toward collaboration, not only among members of various tertiary institutions, but also drawing together the perspectives of industry and government to address sustainability issues in the clothing and textile supply chain. This is considered imperative toward developing relevant curricula that will prepare students for challenges that await them in their future careers and for them to serve as “sustainable change agents” in the local and global fashion community. Participants further emphasised that developing the required curricula necessitates a multi-disciplinary and trans-disciplinary approach that sensitizes students’ toward the broader social and environmental repercussions of their decisions in the clothing and textile supply chain. Context is paramount and embracing indigenous knowledge would be key in addressing the challenges unique to the milieu in which students find themselves. Timely solutions that reflect a mindfulness for and among various generations, including those still to come, was considered an important component of any curriculum. Cultivating a “voluntary simplistic” approach, whereby students are taught to reduce, recycle, reuse and even refuse detrimental alternatives, was also deemed important. Moreover, participants emphasised that students need to be
exposed to projects where sustainable co-creation is infused on both a local and global level. These projects also need to encapsulate applied practices that extend beyond mere theoretical content. Through their involvement in such projects, it is argued that students may develop creative and critical problem solving i.e. scarce skills that are highly sought after by future employers. Participants also felt that as educators they have a major role to fulfil in cultivating more holistic symbiotic perspectives among their students, which may help them to appreciate the complex role of public and private sectors and that will encourage them to engage in sustainable activism. To this end, knowledge sharing would be important. Finally, the economic sphere and the cost of sustainability cannot be disregarded. Regardless of the content being taught, students must understand that sustainability can only be effectively implemented in the current supply chain, if it is economically viable for the industry in question.

**Conclusions and Recommendations**

The textile and apparel industry is recognized as one of the most polluting industries worldwide. Various stakeholders have called for more stringent effort to address environmental concerns in addition to practising close scrutiny of the social and economic repercussions of this supply chain. Such efforts are complicated by the fact that this supply chain is often spread over several continents ranging from the initial raw material extraction and production in developing countries to the more sophisticated consumer markets in developed economies. For these reasons, institutions that offer textile and apparel courses must endeavour to prepare students for the challenges associated with achieving sustainability in the larger global supply chain. This project offered a unique opportunity to challenge intellectual perspectives and add new dimensions to the curricula of both programs at UMES and UP in terms of identified sustainable clothing practices as it relates to the textiles and apparel industry. This endeavour spoke to both departments’ missions in preparing globally competent textile and apparel students for future careers in the field. It is envisaged that students’ attitudes will be shaped toward sustainable practices that reflect a more holistic, global perspective. The process of involving students in a global effort speaks to addressing the need of critical thinking, problem solving, and awareness of united efforts to combat the global issue of sustainability. In addition to providing opportunities for students to develop leadership, critical thinking, decision-making and research skills through engaged learning, the impact of co-curriculum activities may well extend beyond the learning experience of its student participants. Projects of this nature enable respective faculty to engage in international grant and research collaborative efforts, while leveraging relationships and linkages between the institutions, which serves in the best interest of all role players.

*The authors would like to acknowledge the financial support from the Carnegie African Diaspora Fellowship Program (CADFP) for this project.*

68
Introduction

Active academic participation to allow students to acquire appropriate knowledge, skills and values necessary to secure a sustainable future are needed. Prominent skills such as problem solving, critical thinking, creativity, emotional intelligence to name but a few needs to be included in education programs to make sure students are employable, for longer (WEF, 2017). As educators of apparel design students we realised the need to nurture creative thinking through visual literacy. Pennings (2002) defines visual literacy as an area of study that deals with what we see and how we interpret what we see. Visual literacy does not only play a role in communication but is an essential component in design- as well as science and technology education (Duchak, 2014). Living in an evolving technological and visual world, however, does not mean students have sophisticated visual literacy skills. The aim of this study is to assess visual literacy amongst first entry level apparel design students using clothing visuals.

Methodology

Garments were designed for four completely unique fictional characters, one male and three females, by a post graduate student in an apparel design course. Essential design cues were incorporated into the garments. Design elements that focused on silhouette, value, colour and versatility were incorporated. Guidance from Visual Design in Dress (Davis, 1996) and the apparel design lecturers were attained to create these unique garments. Students were presented with images of the garments and questionnaires were used to gather information. A six point Likert scale which measured the views and opinions of the students was used. Open ended questions were included to bring forth descriptive and creative dialog between the viewers, in this case the students, and the images.

A sample of 32 first year Extended Curriculum Program in Art and Design (ECP) students from Central University of Technology (CUT) were tested because these students have little exposure with the dynamics of clothing and clothing psychology. To assess their level of visual literacy, three variables were measured – (a) factual; physical and technical components, (b) interpretive; evaluative thinking and inferential questioning, and (c) conceptual thinking; visual sensitivity and meaningful interaction with material. These topics are increasingly relevant since visual literacy means that students are able to recognize, interpret, and employ the distinct syntax and semantics of visual forms within the context of a sustainable life (Supsakova, 2016).
Results
Content analysis was conducted through the developing and applying of codes using the open coding system. Qualitative data analysis was performed semi-automatically using Excel sheets because of the size of the dataset. The qualitative analysis of the information indicating the level of visual literacy promotes a modification of the educational paradigm to secure a sustainable future. The empirical results provide some useful indications; (a) that the participants could identify with the factual components, (b) that the participants found it challenging to properly deconstruct the hidden meanings rooted in the images, and (c) all of the students could only identify with one of the four images indicating a lack of meaningful interaction by the students with the material.

Conclusions and Recommendations
Focusing on visual literacy skills in education can add another dimension to student’s core knowledge, helping them to become more creative and critical thinkers by identifying, interpreting and evaluating what they see. This study could encourage future investigations on the identification of learnable visual literacy skills and the implementation thereof.

References

1908 Problem-based learning to prepare pre-service Consumer Studies teachers for practical lessons

Dr A. Du Toit, North-West University
dutoit.adri@nwu.ac.za

Key words
Consumer Studies education, pre-service teachers, problem-based learning, practical lessons

Introduction
Consumer Studies is a valuable but complex subject, including seven divergent content foci and five different practical options, to develop learners’ entrepreneurship education. The preparation of student teachers for Consumer Studies consequently need to be carefully structured to ensure that all the intended learning in the subject effectively reaches learners
(Umalusi, 2014:102). Organising and managing practical lessons in Consumer Studies can be challenging and student teachers need to be thoroughly prepared for that. Their preparation has to include real-world examples, exposing them to the types of challenges they will face in their own practical lessons one day. These real-world examples have to require students to think critically, solve problems, organise equipment, develop budgets, effectively manage time and plan according to curriculum requirements – to name but a few. Therefore, not only do student teachers have to be prepared for teaching broad and divergent Consumer Studies content, but also with several 21st century skills to enable them to organise and manage practical production options effectively. One strategy used to prepare students for real-world challenges, is problem-based learning (PBL), which develops various 21st century skills including problem-solving, planning skills and life-long learning. PBL can therefore positively contribute to the development of Consumer Studies student teachers if included in their preparation (Du Toit, 2014:22). PBL has been confirmed to enhance the preparation of South African student teachers for subjects such as Geography (Raath & Golightly, 2017), Technology (Hattingh & Killen, 2003) and Computer Programming (Havenga, 2016). Little research is however available regarding the utilisation of PBL to scaffold student teacher programmes for Consumer Studies education.

Methodology

The main research question for this investigation was: How can problem-based learning contribute to preparing student teachers with the 21st century skills needed to organise and manage Consumer Studies practical lessons?

Four sub-questions structured the investigation:

a) Which challenges are teachers experiencing in Consumer Studies practical lessons?

b) Which 21st-century skills are needed to organise and manage Consumer Studies practical lessons?

c) What can students learn about the effective organising and management of Consumer Studies practical lessons from a PBL experience where they need to analyse an existing food production laboratory in a local school?

d) How does PBL contribute to the development of students’ 21st century skills as part of their preparation as teachers?

Qualitative action research was used: A Consumer Studies teacher needing support with practical lessons was identified by the Department of Basic Education. She was interviewed about the challenges she faces in her practical lessons (sub-question a). Informed by the challenges mentioned, a literature review was used to identify the 21st-century skills that Consumer Studies teachers need for practical lessons (sub-question b). With permission, the interview was recorded and photographs were taken of the practical classroom, and these were subsequently analysed by Consumer Studies student teachers. The analysis was scaffolded in portfolios, following the requirements for PBL. Students developed recommendations to address the challenges faced by the teacher (sub-question c). At the conclusion of the Consumer Studies teacher education module, students completed a questionnaire regarding their experiences of PBL as learning strategy in their teacher preparation (sub-question d). All ethical requirements of the Faculty of Education’s Research Ethics Committee were closely adhered to obtain clearance to conduct the study. Data were analysed qualitatively, using inductive analysis and focussed on challenges posed by the
physical environment (in the practical classroom), as well as potential ways to overcome those challenges.

Findings
Organisational and management challenges were described by the Consumer Studies teacher, mostly related to planning and layout issues. The emerging list of 21st-century skills that Consumer Studies teachers need for practical lessons is long and diverse. Based on the PBL learning in the teacher preparation module, the students made numerous practical recommendations to address the challenges faced by the participating teacher. The students perceived the PBL process as informative, well-structured and highly suitable to contribute to their preparation for practical lessons in future.

Conclusions and Recommendations
PBL contributes positively to the preparation of student teachers through the development of several of the 21st century skills they will need to organise and manage Consumer Studies practical lessons in practice, such as time-management, planning, problem-solving and communication skills. It is recommended that PBL be developed as the core of future Consumer Studies teacher preparation modules, to enhance student teachers’ preparation for this complex and valuable subject.

References
Introduction

“Empowerment refers to the process of increasing personal, interpersonal, or political power so that individuals, families, and communities can take action to improve their situations” (Gutiérrez, 1992). However, an exploratory case study conducted by the author revealed that people with disabilities are disempowered and are faced with barriers that hindered them from participating in income generating activities effectively. These barriers must be overcome in order for people with disabilities to improve their skills and benefit from participation in income generating activities. Giving a person living with disability power and ability to generate his or her livelihood enables them to be economically self-sufficient and eases their full integration into society. The purpose of this article is to propose an empowerment model for people with disabilities participating in income generating activities in a protective workshop. The model is based on the empowerment theory (Perkins & Zimmerman, 1995; Zimmerman, 1995; 2000) and certain components are derived and founded on other existing relating empowerment models (Moran, Gibbs & Mernin, 2017; Shariff, 2015). Compared to other previous studies the main reference is made from the experiences and observations of the people with disabilities who are engaged in income-generating activities.

Methodology

Observations and semi-structured interviews were conducted with 18 purposively sampled participants from one of the protective workshop in Bloemfontein, Free State, South Africa. The criteria for inclusion of the research participants included males and females of working age (22-52 years) and who represented different ethnic groups and languages; participants with physical, mental and intellectual disabilities who have been participating in income generating activities in a sheltered workshop for longer than a period of six months. Ethical approval was obtained from the Natural and Agricultural Science Ethics Committee, University of Free State.

The researcher used the empirical findings from the qualitative explorative single case study, ‘Barriers experienced by people with disabilities participating in income-generating activities: A case of a sheltered workshop in Bloemfontein’ (Tinta et.al 2019). The participants in this study identified a number of challenges that limited their participation in economic activities. These included ability to use working tools, lack of funds, language barriers, lack of motivation, inability to concentrate for long periods, activities not challenging, lack of artistry skills, and exclusion from decision making. These findings were applied to develop an
empowerment model for people with disabilities participating in income-generating activities in the protective workshop.

Findings

The proposed empowerment model presents the following components: personal empowerment, education and training, support, participation. The interaction of these components of the model attempts to overcome the identified barriers and provide steps to facilitate successful participation. This proposed empowerment model differs from prior work empowerment because of the greater specificity of the components. For example, how important it is to give power to people with disabilities, what strategies are required to empower people with disabilities, instructors and organisation. The model also highlights potential training opportunities aligned with the needs of people with disabilities. In addition, it provides possible activities that can be applied to meet the basic educational needs of people with disabilities.

Conclusions and Recommendations

People with disabilities desire to be productive so they can fulfil their goals. Just like everyone else, they have great potential, abilities and interests. Provided with appropriate opportunities and support, they could provide for themselves, help alleviate poverty, contribute to their development, as well as to the development of the society. The proposed empowerment model will contribute to improving the quality of life of people with disabilities as well as empower instructors and or teachers of disability centres. Additional work needs to be done to test the effectiveness of the empowerment model. It also needs to be validated within people with disabilities.

References

1978 An evaluation of food security interventions: A perspective of food security programme implementers at the University of KwaZulu-Natal, South Africa

Dr S. Sabi, Mr D. Naidoo, Prof U. Kolanisi & Prof M. Siwela, University of Zululand
SabiS@unizulu.ac.za

Key words
Food-aid perceptions, food insecurity, programme management, social security, university students

Introduction
In post-apartheid South Africa, food insecurity is a rising phenomenon among students attending universities. The country’s economic prospects are affected by low graduation rates and entry into the labour industry caused by poverty-related factors such as high food insecurity prevalence among university students. The University of KwaZulu-Natal (UKZN) an institution with more than 50% of students from historically disadvantaged backgrounds implemented the food security programme (FSP) in 2012, to address the problem. The form of assistance includes meal vouchers and food hampers to students in need. Since the programme inception in 2012, there has been no documented analytical and interpretation dimension of food insecurity at UKZN, thus the significance and contextual effects of the food insecurity is not yet understood. The study objective was to evaluate the UKZN FSP i.e., it aimed to gain insight of key informants’ experiences and perceptions in managing the food security interventions at UKZN.

Methodology
A qualitative research using an explorative qualitative research design generated data from six key informants using individual face-to-face interviews. A purposive sample as a case study systematically included the four middle and two senior managers of the FSP at UKZN’s five campuses to gain insight of key informants’ experiences and perceptions in managing the food security programme. Data was analysed qualitatively using thematic and narrative analysis narrative analysis.

Results
The findings established that while the FSP has met some of its main objectives such as, providing a very basic human need, or a nutritious meal to some critically food insecure students, who otherwise would have been unable to cope and to meet the higher educational demands during the semester, the programme is not formalised i.e. it operates as a self-help initiative linked to a social responsibility activity of the Institution. ‘Underestimation’ and ‘denial’ of food security implication resulted in the lack of prioritisation and mainstreaming of the programme. Ultimately, there is lack of sustainable funding, personnel, and infrastructure.
Conclusions and Recommendations

The study suggests that ‘programme ownership’ and ‘clear programme orientation’ are the most fundamental elements in building a sustainable and effective food security intervention at the Institution. The study concludes by developing a framework for managing the food security programme at the Institution. The framework highlights some fundamental elements in building a sustainable and effective food security intervention.

References

1912 Entrepreneurship education fortifying Consumer Studies: A case study

Dr A. Du Toit, North-West University
dutoit.adri@nwu.ac.za

Key words
Consumer Studies, curriculum, entrepreneurship education, financial resources, practical lessons

Introduction

The lack of resources available to Consumer Studies teachers to effectively facilitate the subject is a persistent concern (Du Toit, 2019). The practical food production component of the subject is viewed as being expensive, based on the ingredients and equipment that is needed to meet the goals of the intended curriculum. When financial resources are limited, it becomes even more difficult for a school or teacher to provide all the resources needed to meet curriculum goals. Consequently, in some under-resourced schools teachers simply have learners complete fewer practical lessons than what is required in the curriculum (Du Toit, 2018:197). Fewer practical lessons mean that learners learn fewer skills and, considering that the purpose of the practical lessons are to support entrepreneurship (Department of Basic Education, 2011:9), this is a serious concern in a country with high youth unemployment. Even more perturbing is that some schools are closing down Consumer Studies because of a lack of funds, which eliminates the potential of this subject to develop South African learners’ entrepreneurial competencies. Financial inadequacies additionally place a burden on Consumer Studies teachers, who are continually struggling to generate income for their subject, or to fortify their subject against these challenges. The question therefore was: What can be done to fortify Consumer Studies against the challenges that insufficient funding poses for the subject?

The term ‘fortify’ can be replaced by several synonyms, including enrich, augment, sustain, support, strengthen, or revitalise. The Oxford English Dictionary (2019: n.p.) explains ‘fortify’ as “to strengthen mentally or morally; to endow with immaterial resources; to impart fortitude to; to cheer, encourage... to confirm, corroborate, add support to...”. Consumer Studies teachers therefore need support to fortify their subject against the challenges of limited financial resources.
During a nation-wide investigation of the practices of Consumer Studies teachers in South Africa (Du Toit, 2018), one school emerged that has developed just such a fortification strategy. The Consumer Studies teachers at this school reported that they are generating financial resources for their subject, while at the same time expanding the number of learners selecting the subject in that school. Their success inspired this article, which has the intent of sharing and disseminating their fortifying strategy in the form of pragmatic steps, which other schools’ Consumer Studies teachers could then duplicate.

Methodology

A qualitative case study was used. In the initial investigation (Du Toit, 2018), 166 snowball-sampled teachers of schools in each province in South Africa were interviewed in focus groups, using open-ended questions. When it emerged during the Western Cape session that participants from one school had developed a very successful strategy to address financial limitations for Consumer Studies at their school, follow-up questions and discussions (recorded and transcribed) were used to gain deeper insights into how these two teachers managed to fortify their subject so effectively. Data from the interviews were triangulated with a written outline of their strategy, which they provided electronically. Qualitative analysis was used to disseminate data about their strategy into categories and themes, which were then organised into steps that align with the goals (informed by document analysis) of the Consumer Studies curriculum.

Findings

The system used by this school is based on the entrepreneurial intent already embedded in the Consumer Studies curriculum. These teachers successfully generated income, as well as expanded learner-interest in the subject, by effectively integrating the entrepreneurship in the subject with its practical component. A simple, step-by-step strategy, which most Consumer Studies teachers should be able to implement without much difficulty, was developed. The steps of the strategy were compared to the requirements of the Consumer Studies curriculum and small adjustments were made to better align the original strategy with curriculum goals for entrepreneurship.

Conclusions and Recommendations

Consumer Studies offers expansive entrepreneurial education and efforts should be made to find alternative ways to fund the subject and keep it in schools. The strategy developed here can help to fortify Consumer Studies (and its subject teachers) against the challenges that insufficient funding holds, such as the subject closing down (and teachers becoming unemployed) or learners not having all the practical lessons they are supposed to. It is recommended that this strategy be widely publicised to Consumer Studies teachers and that further research be conducted to find more ways to provide funding for this important subject.

References

1943 The influence of university students’ accommodation on student academic performance: A case study of University of Botswana

Ms C. Dikgang, Ms M. Phegelo, Dr B. Mantyi-Ncube & Dr K. Kgosi, University of Botswana
cathrinedikgang1@gmail.com

Key words
On-campus students; off-campus students; living arrangements; academic performance

Introduction
Student academic achievement is influenced by many factors of which living arrangements is one of them. Before the era of ubiquitous information and communication (ICT) technology, on-campus students were likely to perform better academically than those living off-campus because they lived in a more conducive environment which allowed pervasive interactions among peers. Of late, the ubiquitous presence and communication ICT facilitates communication and interaction with family and friends without being limited people on campus. Furthermore, Studies have found mixed results owing to the great variety of settings including halls residence type, programming and participation from residents (Graham, Hurtado, & Gonyea, 2018). Some recent studies have mostly found no difference between the academic performance of on and off campus that could be attributed to their living arrangements (Nelson, Misra, Sype, & Mackie, 2016; Muslim, Karim, & Abdullah, 2012; Simpson & Burnett, 2019). However, Maina & Aji, (2017), found that on campus students performed better academically. Graham et al., 2018, also found that on campus students had minimal advantage over their off campus in three aspects namely; more engagement in collaborative learning, discussions with diverse others and student faculty interaction. These mixed findings emphasize the contextual aspect of the relationship between living arrangement and academic performance. To our knowledge no study on the influence of living arrangements on university student performance has been conducted in the Botswana setting hence this study.

This aim of this study was to assess the influence of living arrangements on academic performance of University of Botswana students. The objectives of the study were: (a) compare the perceptions of on-campus students and off-campus students on the effect of living arrangement on academic performance; (b) identify the accommodation challenges faced by students that affect their academic performance; (and, (c) identify strategies that
respondents perceive can improve student academic performance at the University of Botswana.

**Methodology**

The researchers conducted a study that focused on University of Botswana because it has a high population of students living both on and off campus. This research focused on second year students from five programs in the Faculty of Education. Second year full time students have experience on living both on-campus and off-campus. Stratified random sampling was used to sample 10 participants each from the selected programs to make a total of 50 participants. A self-administered questionnaire was used to collect data in line with the objectives. After explaining the objectives of the study, the questionnaire that consisted of questions to collect demographic information and those to collect information on the study objectives was handed to the respondents who agreed to participate. The respondents signed a consent form. The data from questionnaires was analysed using SPSS statistical package. For the first two objectives, percentages were calculated to interpret the data, while for the last objective, means and standard deviations were used to interpret the Likert scale item responses.

**Results**

A total of fifty respondents were sampled: twenty five respondents lived on campus and the other 25 lived off campus. The results indicated that majority of the respondents perceived that there was no difference in the academic performance of both on-campus and off-campus students. This is in agreement with previous studies (Muslim et al., 2012)(Simpson & Burnett, 2019) and probably affirms the fact that ICT extends and facilitates the necessary communication and interaction that previously would foster better academic performance of on campus students.

The study found that off-campus students were mostly affected by financial constraints since they have meagre income which they use to pay for among other expenses, transport and accommodation. On how academic performance could be improved, most of the respondents indicated that study groups could be used to improve performance, emphasising the importance of interaction and communication. This is supported by Kuh, Gonyea and Palmer (2001), who asserts that study groups help students to engage in discussions that can help them to understand difficult concepts better. However, Jain & Kapoor (2015), found that study groups have no discernible impact on academic performance, a result they attributed to the group heterogeneity in ability. They further found that lower-ability students benefited from higher-ability students and not vice versa. The current study assessed the student perception of the respondents and there could not have given the actual impact of study groups on the performance of the respondents.

**Conclusions and Recommendations**

In conclusion, as perceived by the respondents in this study, living arrangements does not have a direct influence on academic performance. Financial constraints were mentioned by off-campus students as a problem which could negatively affect their academic performance if not addressed. Study groups were identified as a strategy that could improve academic performance, further emphasizing the need for interaction and communication. Future
research should target a bigger sample including students from other local institutions to further assess the influence of living arrangements on academic performance. The impact of study groups on academic performance could also be investigated further.

References

1924 Exploring the relationship between food security, student progression and retention at a large South African University

Ms F. Wagner, Ms T. Kaneli & Dr M. Masango, University of the Witwatersrand
Fezile.mdluli@wits.ac.za

Key words
Food security; student progression; student retention; university; higher education institution, South Africa

Introduction
Student food security is a challenge that is not well understood in higher education institutions. Food security is defined as having both physical and economic access to food that is safe and nutritious in sufficient quantities (FAO, 2015). It is important that we gain insights on this topic, especially as higher education becomes more accessible to students from diverse socio-economic backgrounds (Wits AIRU, 2019). Recent statistics have shown a consistent increase of students coming from lower quintile schools attending university. This trend is catalysed by recent higher education policies that have lowered the financial barriers that have prevented poorer students from attending higher education institutions in the past. This suggests an increasing number of students coming from potentially highly food-insecure environments who may not have access to stable and adequate financial resources to allocate to their food budget once they are at university.
The issue of food security should be considered as critical during student transition from high-school to university. The first year of study has been generally acknowledged as being critical to the success of students (Nelson, Duncan, & Clarke, 2009). The first year experience is so crucial that negative experiences and circumstances in the first year are most likely to lead to student dropout, hence the high attrition rates in the first year. This reaffirms the importance of assessing the impact of students’ food security status on their progress and retention.

A 2018 study on almost 400 undergraduate students at a large South African University found 7% of undergraduate students to be moderately and severely food insecure (Rudolph et al., 2018). The study also found that students felt that their food insecurity status negatively influenced their academic outcomes. This study aims to develop this work further, by exploring whether a student’s food security status influences student progression (whether a student meets the requirement to progress to the subsequent academic year) and student retention (whether a student re-registers in the following academic year regardless of academic outcome; disregarding cases of exclusion).

**Methodology**

This work aims to ascertain the food security status of first time first year students at a large, urban South African university. We aim to measure food security using the Household Food Insecurity Access Scale (HFIAS), and the Dietary Diversity Score (DDS). Data will be collected in the month of September 2019, using a self-administered online survey on the REDcap® platform. These data will be linked to student academic outcomes at the end of the 2019 academic year using unique identifiers. In addition to descriptive analyses, Pearson’s chi-square test and multivariate regression analyses will be carried out to determine if any associations exist between student food security, their academic outcomes and retention. Ethical clearance for this work has been received.

**Hypothesis**

We hypothesise that food insecurity will adversely affect students’ academic outcomes, reducing the likelihood of students’ progression to the following academic year. We further hypothesise that students who are food insecure pose a higher attrition risk than their food secure counterparts.

This research is an opportunity to deepen our knowledge on the contribution of students’ food security status to student success. Findings from this work will assist the university to better understand the challenge of student food insecurity. Furthermore, understanding levels of food insecurity and identifying associations may lead to targeted interventions aimed at alleviating its burden.

**References**


Wits AIRU. (2019). Internal report on Student Home and School Background Information.
4. ENTREPRENEURSHIP

1923 Exploring alternative start-up methodologies for South African entrepreneurial fashion designers

Ms M. Vermeulen, Prof T. Tselepis & Dr D. Smal, University of Johannesburg
Mieke.vermeulen@yahoo.com

Key words
Entrepreneurship, start-up phase, fashion design, lean start-up methodology, financial bootstrapping

Introduction
A surge in clothing imports from international markets to South Africa in the early 2000’s resulted in both a loss of job opportunities and high levels of competition in price and product offering in the local fashion design and clothing industry (Kunene, 2008:15; Morris & Barnes, 2014:9,10; Vlok, 2006:236). Faced by unemployment, many South African fashion designers are necessitated to follow entrepreneurial routes (Moodley, 2003:5). Although in turn, entrepreneurs in South Africa face challenges such as politically-motivated economic setbacks in recent years, as well as a lack of access to financing and business skills or training (Botha, De Rijk-Uys & Van Dijk, 2015:22; Herrington & Kew, 2016:32; Herrington, Kew & Mwanga, 2017:5-7). Consequently, the objective of this study was to propose an alternative framework (as opposed to conventional methods) of business planning and resource acquisition and/or business start-up to aspiring designer-entrepreneurs in South Africa. It was argued that incorporating business activities with design activities (taking a lean and bootstrapping approach) may reduce cost and risk during the search for a viable fashion business model, as well as the creative application of the minimum available resources to finance business start-up.

Methodology
The proposed alternative business start-up methods of lean start-up methodology and financial bootstrapping were applied to investigate whether South African fashion owner-designers had employed alternative concepts, techniques and resources in practice to start their businesses. A qualitative research methodology (from a post-modern perspective) was chosen to investigate the real-world practices of owner-designers (Cooper & Schindler, 2014:146-148) using a case study research design. It was important in this study that the sources of information are free and accessible, and thus the process is suited to the often cash-strapped creative entrepreneur who may not have access to financial capital or business training. Therefore, cases were identified online, as this is the channel many fashion entrepreneurs use to share experiences and challenges to inspire or educate aspiring entrepreneurs. Owner-designers who started their businesses after the 2000’s (corresponding with the surge in imports in the early 2000’s) were deemed the most suitable
subjects for the research. The data was gathered through document study of interviews conducted with South African fashion owner-designers (15 designers), as well as articles written about them, their websites and social media pages. Moreover, research has pointed to the use of SNS, blogs, video and photo sharing websites and podcasts for educational purposes in businesses about topics including products and brands (Mangold & Faulds, 2009:358-359).

**Results**

Data analysis revealed that owner-designers had employed alternative methods to business start-up and five main methods of application in a fashion business context were discovered. The five main methods include owner-related, family-related, peer-related, market-related and industry-related methods of resource acquisition and start-up techniques. Owner-designers not only applied alternative methods to start their businesses, but a certain approach (or mindset) was applied to product development and business start-up, namely: a customer-driven approach, experimental multi-directional approach and strategic approach to combining design and business objectives early on in the start-up process.

**Conclusions and Recommendations**

The findings on owner-designers were transferred to designer-entrepreneurs in the form of a framework which brings fashion product designs to market early in the development process with feedback loops to validate product and business model ideas, as well as suggested methods of resource acquisition at each point. Future research may seek to validate the proposed framework.

**References**


1986 Developing and marketing sorghum baked products through the innovation hub: A diagnostic study on national university of Lesotho

P Nkhabutlane, National University of Lesotho

pn111@hotmail.com

Key words
Sorghum, innovation, business, Lesotho

Introduction
Lesotho is faced with variable and lower rainfall patterns, which restricts productivity of many crops, and only sorghum serves as a principal cereal, because it can withstand drought (FAO/WFP, 2007). According to Lesotho tradition, sorghum is the oldest grain known and was regarded as the most important cereal (Ashton, 1939). When ground between two stones sorghum grain was used for baking bread, or porridge, or fermented beer and also to make a refreshing non-alcoholic (motoho) drink which is very popular on hot days. Sorghum meal prepared in the form of porridge has always been used by lactating mothers and for weaning infants.

Although many foods have been prepared by Basotho from sorghum, the consumption of sorghum products is declining significantly every year. The decrease in sorghum products consumption is mainly due to labour intensive processes that are time-consuming, not tasty, out dated (old fashioned) and associated with poverty (Nkhabutlane, Du Rand & De Kock, 2014). According to our knowledge Lesotho does not have food industries focusing on recipe development, which could create more opportunities for entrepreneurs’ to produce new products using local resources for sale. In addition, Ethiopian Agricultural Transformation Agency (ATA) (2015) mentioned that there is very limited sorghum value addition, industries are lacking information about the alternatives of the crop, processing techniques and methods and as a result, industries are running away from risk of market loss. With this background it was therefore necessary to apply research to create value added innovations within the incubation hub of the National University of Lesotho on sorghum, in order to transfer new technology initiatives that can more directly connect university ideas with the needs of the real world. This study therefore aimed to investigate the stages of incubation of a startup and the model employed to transform university research and intellectual capital into innovations, transfer the enthusiasm and ideas of students and faculty into real world applications, which can result in the development of new products, businesses, and industries.
Methodology

A baseline study was conducted in November 2017 through an individual face-to-face interview with each entrepreneur. The interview schedule consisted of physical product description analysis where the three entrepreneurs explained the products that they were providing to the market, progress of the business and experiences. The interviews lasted for 30 minutes for each entrepreneur. Furthermore, a diagnostic study was conducted in November 2018 through a 30 minute individual face-to-face interview with each entrepreneur and the coordinator. The interview schedule consisted of a report back on the business progress, lessons learned and challenges of running a business within the university setting. In addition to the interviews, observations, consultations and interactions were used to establish the company’s current reality, its needs, the business challenges as well as opportunities at its disposal.

Results

formation related to the progress of the establishment of a start-up in the university setting revealed the three most important stages of innovation and incubation (pre-incubation, incubation process and post – incubation). The incubation process also resulted in the five phase model which includes funding, entrepreneurs, planning and preparation, implementation and commercialisation. A number of challenges were identified which involved sourcing raw materials for recipe development, the formulation challenges of sorghum baked products and the bureaucratic nature of the University.

Conclusions and Recommendations

The study aimed to investigate the performance of a university start up through stages of incubation and the model used for its establishment. According to the results achievements of this initiative involves mastering the recipe development skill using sorghum, creation of jobs for entrepreneurs and documenting incubation process model that can be used in the future. Considering the type of challenges faced it was recommended that the startup should work hand in hand with the Ministry of Agriculture in order to organize farmers well in advance to produce large quantities of good quality sorghum. Another recommendation was that the innovation hub should be an independent body within the university in order to overcome challenges coming along with bureaucracy.

References

Introduction

Entrepreneurship is a representation of business tenacity and achievement; it is a vital source of change in all facets of society. It requires numerous skills but mostly perseverance. It is considered an economy boost and the solution to the current unemployment problem amongst the youth but survival rates of youth owned businesses in informal clothing manufacturing enterprises are drastically low but not only that they are also very scarce. Youth are the majority of the population within the respondents because of the high rate of unemployment so they opt for entrepreneurship as a way of earning money (Bushel 2008). According to Kebonang (2012) the set eligibility criteria for accessing these services has created binding constraints especially to women and youth entrepreneurs. From previous studies these enterprises face tremendous challenges that threaten their survival and growth (Jefferis, 2010). Entrepreneurship skills involve recognizing economic opportunities and acting effectively on them (Mcclelland, 1986).

Methodology

Both qualitative and quantitative methods were used for this study. The method used was mixed-method approach. The research population for this study was twenty eight (28) youth entrepreneurs operating in informal clothing manufacturing enterprises in African Mall, Gaborone. Probability sampling method was used as the researcher used their best judgment when selecting the sample. A questionnaire with both closed-ended, open-ended questions and a 5 point Likert scale was used to collect data. For face and content validity the instrument was given to two professionals and comments and suggestions were used to improve the instrument. Pilot-testing was conducted through administering the instrument to three respondents with similar characteristics to the study sample. A questionnaire was used for collecting data. The Statistical Package for the Social Science (Version 25) software was used for data analysis. Pie charts, graphs, and tables, means and standard deviations were used to interpret the study results.

Results

It was perceived that most female youth make up the population of the respondents and that they encounter numerous challenges and obstacles during both the start-up and day to day running of their enterprises.
Conclusions and Recommendations

Entrepreneurship skills are a great necessity for the success of a business. Further studies can be conducted using a different research instrument to find out ways in which the entrepreneurs can be educated about business. It was observed that most female youth make up the population of the respondents. And that they encounter numerous challenges and obstacles during the course running of their day to day business or during the start of their business. From the study finding it was observed that education also had an effect on the success of the business. Despite government efforts and policies put in place to assist these small enterprises, but majority of the respondents proved not to be knowledgeable about them. Entrepreneurship skills have been proven to be a great necessity for the success of a business.

References
5. FOOD AND NUTRITION

Dr C. Johnson, University of the Virgin Islands
cjohnso@uvi.edu

Key words
Food security, malnutrition, micronutrients, nutrition education

Introduction
Micronutrient malnutrition continues to affect many children under the age of five and women of child bearing age in Ghana, West Africa. This research study used qualitative data to examine the dietary habits of rural families in the Volta Region of Ghana, West Africa. One of the major goals set-forth by the Ghanaian government by the year 2020 is to reduce malnutrition especially among women and young children. Pregnant and lactating women, infants, and children age five and under were the focus of the study. The major objective of this field research project was to determine the dietary habits of rural families living in the village of Wusuta and the fishing villages of Kpebe, Sakatsire, and Avate-Tormu which are located on Lake Volta. The study objectives were to: (1) identify foods eaten daily; (2) identify nutritional value of consumed foods; (3) identify nutritional knowledge of women; (4) identify if women and children are consuming nutrient supplements; and (5) identify sources of foods consumed. The research project was a partnership between Eastern New Mexico University (where the author taught) and the University of Ghana.

Methodology
Dietary habits, sources of foods consumed, and the nutritional knowledge of women were documented by the researcher and graduate students from the University of Ghana in the format of field research notes, observations, interviews, and photos. Data collected was analysed to determine if dietary guidelines as outlined by the Ghana Government – National Plan of Food and Nutrition were being met. A computer software program was used to analyse the results. Data was collected and compared during three difference harvesting seasons to determine if the variety of foods consumed had a significant influence on the nutritional intake. One of the objectives of the field research was to obtain a cross section of families within each research site that represented various social economic levels, occupations, and educational levels in order to obtain a better sampling. With the help of the village chiefs the researcher was able to identify various groups and get a better sample. The Ewe people who live in the Volta villages speak English but some of them do not used English on a daily basis. Therefore, a translator was needed to either ask questions and/or translate answer from studied population.
The second phase of this research was to compare the results of this project and the Ghana Micronutrient Survey 2017. The Micronutrient Survey 2017 was done because a comprehensive national data on micronutrient situation in Ghana especially for children under the age of five and women of reproductive age have largely been unavailable. The national survey was a collaboration between The Ghana Health Service and UNICEF. The survey was the target population that the researcher had studied ten years earlier. The researcher made a comparison between the original data collected in the Volta Region with the results of the 2017 survey.

Results

A total of 192 women were interviewed in the four villages of this study. The research indicated that women were consuming an average of 15.2 mg./day of iron which is low. It is low because the recommended amount is 18 mg per day for women and 27 mg per day for pregnant women. The consumption of vitamin B12 was 1.70 ug per day and the RDA is 2.4 mg per day for women, 2.6 ug per day for pregnant women and 2.8 ug for lactating women. The consumption of zinc was acceptable. Vitamin A consumption in the Volta Region of Ghana in this study was high with the average being 1600 ug/day. Whereas, in comparison, the Ghana Micronutrient Survey which was conducted in 2017 found Iron, Vitamin A, Vitamin B and folate acid deficiencies. The lack of micronutrients in the diet has led to mandatory fortification standards for iodine in salt and iron, zinc, the B-vitamins and Vitamin A for wheat flour. Vegetable oil is fortified with Vitamin A.

Conclusions and Recommendations

Is there hidden hunger in the Volta Region of Ghana? There have been some reductions in micronutrient deficiencies of the past ten years. However, Vitamin A and iron deficiency is still high in Ghana due to a lack of access to fortified nutritional foods. Nutrition education for the target population is needed. Most of the women interviewed in the study are farmers. Education needs to be done to show them how to plant a variety of fruits and vegetables and the nutritional benefit of growing these crops. It remains to be seen if the micronutrient goal will be met in Ghana by 2020.

References

Ghana Micronutrient Survey 2017 Final Report. Recommended Citation: University of Ghana, University of Wisconsin-Madison, KEMRI-Wellcome Trust, UNICEF, Accra, Ghana, 2017/
Health and climate impacts: Nutrition education & healthy families in the United States Virgin Islands

C. Chanes, Dr S. Latesky & Dr D. Morris, University of the Virgin Islands
christina.chanes@uvi.edu

Key words
Nutrition, education, outreach, food safety, water quality, sustainability, resiliency, public health, climate

Introduction
The world population is expected to reach 9.7 billion by 2050, so the demand for quality drinking water, nutritious food and increased food safety is imperative. In a progressively complex context and considering recent global weather and climate change events, those three essential materials have become interdependent and relate directly to community health. To increase food production, greater amounts of quality water and soil are required, which in turn will make food safety education and community health more imperative as extreme weather and climate events take place. Waterborne diseases due to mosquitos can spread Zika, Dengue and Chikungunya among others and are of concern in the USVI as illness relating to these can impact the community and can also have an economic impact due to the cost of medical care. Food safety is also a concern of post storm conditions including refrigeration as food temperatures can be severely impacted due to constant electrical power outages which can spoil food.

Methodology
Using surveys from small focus groups conducted in community outreach meetings with residents and stakeholders after the impact of two Category Five hurricanes in the territory in Sept of 2017 researchers, evaluated data collected including health behaviours in relationship to climate changes, water borne illnesses including zika, chikungunya after two Category 5 hurricanes. The purpose was to analyse the established link between environmental and climate change attitudes to drive research and or the need for prevention efforts and the need to message to at risk populations across the territory for increased public health. Designed as an outreach and education program it addressed the needs of stakeholders affected by two Category Five hurricanes who are socially disadvantaged families and seniors that during these severe weather events were unable to leave. It was urgent to develop innovative health strategies to support an adequate supply of food and water to ensure food safety and healthy communities for future generations, due to climate change and determine what attitudes, if any, have resulted from the impact of two back to back extreme weather incidents which rattled the USVI.

Results
Of the more than 500 participants territory wide from all facets of the community residents were able to see, talk to and meet with scientists, nutrition educators, public health officials and mental health professionals to determine safer levels of drinking water, ways to prevent
cistern and or well contamination. In addition, discussion of healthy food habits as related to post extreme weather events included reducing sodium-based foods such as canned foods, increase food safety including discussing steps in food handling, safe cooking temperatures, and cold food storage such as a solar refrigerator or cold storage unit such as an ice chest.

Conclusions and Recommendations
This program served as an outreach in food security and water quality efforts so that families in the territory could access water and soil quality tools for home gardens which were necessary for increased food production post storms due to a lack of available food in stores. It also showed through the research survey conducted that more than 80 percent of those who participated reported post storm indicated that they were interested in conserving energy and learning more about reducing waste as well had an increased awareness of contamination of water sources, food safety and impacts of waterborne illnesses and they understood ways to reduce waterborne disease. More research should be conducted as funding becomes available and other countries with economically disadvantaged populations should work to adapt this program and use it to address extreme weather incidents including water and food shortages facing at risk populations worldwide.

References

- 1928 An observational study of the implementation of the National School Nutrition Programme in three secondary schools in Tshwane

_Mrs M.M. Van Deventer, Prof H.C. Schönfeldt, Mrs C. Muller & Dr B. Pretorius, University of Pretoria_

_Maricia.vandeventer@up.ac.za_

Key words
National school nutrition programme, South Africa

Introduction
The National School Nutrition Programme (NSNP) was implemented to enhance learning capacity and education of school going children by providing a daily nutritious meal (DBE and DPME, 2014). One of the main goals of the programme was to improve the health and nutritional status of the poorest learners. The programme’s objectives are defined as (DBE and DPME, 2014):

1. To contribute to enhanced learning through school feeding;
2. To strengthen nutrition education in schools in order to promote healthy lifestyles;
3. To promote sustainable food production initiatives in schools;
4. To develop partnerships to enhance the programme.
During the national review many factors that influence the success of the programme came to light. Of the complaints received from the schools were that the products were not delivered on time or that all the products were not delivered. The observation from the learners was that the portion sizes of the meals were not always adequate and that the taste of some of the meals lacked flavour (DPME, 2016).

Methodology
The goal of the project was to investigate the implementation of the NSNP at grass root levels and determine if the problems reported in the 2016 review have been resolved. Semi-structured interviews were held with personnel involved in the implementation of the NSNP at three secondary schools in Tshwane to ensure that different scenarios were investigated. The semi-structured interviews were guided by a set of questions that consisted of both open-ended and close-ended questions to lead the conversation. These interviews were recorded and transcribed. The principal of the school, the NSNP coordinator and cooks were interviewed and asked to sign a consent form. During the interview, a tour was given, by the coordinator, to view the facilities available. Where possible, photos were taken of the food prepared on the day of the visit.

Results
The school visits provided an in depth view of how the NSNP is implemented on grass root levels. The results from the interviews, regarding what can be improved in the school feeding scheme, all came to the same conclusion. All parties involved at the three different schools felt that a formal dining hall would resolve many physical problems around the NSNP such as the disappearance of crockery and cutlery. They believe the children would also be less arrogant and more respectful towards the personnel.

The NSNP is beneficial not only to the learners that attend these schools who rely on the meals to survive but also to those that have money to buy a different protein at a vendor. Vendors enter the school premises during the serving hours and many children only take the starch of the day and buy a different protein from one of the vendors such as chicken legs. The schools do take it upon themselves to help the children and improve the meals. Some schools hold fundraisers and use the money to buy spices and flavourings. Schools also had the initiative that learners could bring their own lunchbox to school to take extra or left-over food home for the weekend. Extra stock was also distributed amongst poor learners at the end of each school term.

Conclusions and Recommendations
There is room for improvement on various aspects of the NSNP, which could be a study on its own. What was observed was that each school faces different problems, ranging from the arrogance of the learners or the facilities available to prepare the food. However, each school handles the problems in their own way and the people responsible for the implementation do have the learner’s best interest at heart and are willing to walk the extra mile.

References
1961 Health-consciousness of working female consumers in relation to their perceived healthiness and selection of packaged foods

Ms C. Abrahams, Prof D. van der Merwe & Dr M. Wicks, North-West University
cherelle.abrahams@nwu.ac.za

Key words
Consumer decision making, food label, food selection, health-consciousness, health perception, healthy food, packaged food, working woman

Introduction
A healthy lifestyle relates to a proactive resolve to avoid contributing factors to the development of non-communicable diseases (NCDs), such as unhealthy dietary habits (WHO, 2016:1). The consumption of nutritious foods and being physically active, correlate with higher levels of health-consciousness (Mai & Hoffman, 2012:317). Health-conscious consumers are mindful of their wellness, have basic knowledge about health-related issues, and are keen to engage in health-related behaviour (Lee et al., 2014:31). While some consumers regard themselves as being health-conscious, this is not necessarily evident in their food decisions (Botelho et al., 2018:435). International research indicates that compared to their male counterparts, female consumers usually demonstrate higher levels of health-consciousness (DiPietro et al., 2016:500). Despite this, South African female consumers have the highest prevalence of NCDs globally (StatsSA, 2017). Besides, scholarly literature regarding the relationship between South African consumers’ food label usage (Koen et al., 2018:416), their health-consciousness and healthy lifestyle behaviour, is scant (Mashigo, 2014:11).

Consumers must be aware of and understand health-related communication tools such as food labels (Lee et al., 2014:35) to contribute to the alleviation of diet-related NCDs. Thus, research should establish the health-related criteria that working female consumers – who frequently face time constraints (Mkhize & Msomi, 2016:33) – apply when selecting packaged foods in a South-African context.

This study aimed to describe the health-consciousness of working female consumers in terms of their perceived healthiness, and selection of packaged foods, taking demographics into account. The objectives were to:

i. categorise working female consumers based on their health-consciousness;
ii. compare the health-consciousness of working female consumers based on their perceived healthiness of packaged foods and selection of packaged foods from a product range; and
iii. determine the demographic differences of working female consumers regarding their health-consciousness as well as their perceived healthiness of packaged foods and selection of packaged foods from a product range.

Methodology
This quantitative, descriptive study used purposive sampling and a cross-sectional electronic survey to collect data from 416 working female consumers across South Africa. The online questionnaire related to these consumers’ health-consciousness, their perceived healthiness and selection of packaged foods. We included a standardised Health-consciousness Scale (Kraft & Goodell, 1993:23) to probe respondents regarding their levels of health-consciousness. Respondents also had to indicate the health indicators they apply during food product selection using a 5-point Likert scale ranging from 1=not at all to 5=a great deal. Data were analysed using descriptive statistics. Exploratory factor analysis (EFA) was conducted for all scales to determine construct validity while the Cronbach alpha coefficient was calculated to establish internal consistency reliability. Mean factor scores for all factors were also determined. Spearman’s rank order correlations were determined between respondents’ health-consciousness and their health perceptions of packaged foods. Cross tabulations, t-tests and effect sizes were used to establish demographic differences regarding respondents’ levels of health-consciousness, perceived healthiness and packaged food selection.

Results
Factors extracted with EFA yielded Cronbach alpha values ranged between 0.70 and 0.88. Results indicated that on average respondents were “quite a bit” health-conscious (mean=3.7) on a 5-point scale. The health-consciousness factor correlated practically significantly with respondents’ perceived healthiness regarding claims (r=0.47) of high (r=0.42) and low (r=0.41), and food label information (r=0.51) as well as showing a tendency to correlate with natural foods (r=0.38). Results showed no associations between respondents’ health-consciousness and the correct food product selections. However, respondents’ perceived healthiness of packaged foods correlated with their reasons for their product selection (r=0.013 to r=0.676). Furthermore, no practical significant differences were found for respondents’ health-consciousness, perceived healthiness, and food product selection based on demographic subgroups.

Conclusions and Recommendations
Respondents, on average, regarded themselves as relatively health-conscious, which correlated with their perceived healthiness of food based on several health-related criteria. Still, their health-consciousness did not necessarily culminate correct food product selection. Therefore, nutrition education programmes should not only inform consumers about health-consciousness but also on the proper use of food label information when evaluating food products to make a healthy food product selection. Demographics did not significantly influence respondents’ levels of health-consciousness in relation to their food product selection; thus these education initiatives should be extended to all consumer groups to contribute to healthier food choices.
References

1970 Feeding practices of infants aged 0-12 months and knowledge levels of primary caregivers at Esikhaleni, Kwazulu-Natal

Dr C. Du Preez & Mr R. Manzini, University of KwaZulu-Natal
dupreezc@unizulu.ac.za

Key words
Infant feeding, breast feeding, knowledge, practices, primary care giver

Introduction
Mothers are educated throughout pregnancy and after giving birth, during clinic visits, on the benefits of exclusive breastfeeding and alternative infant feeding practices, it is however not always the mother who is the primary care giver of the infant. In addition to this, feeding practices are influenced by other factors such as tradition, media, family and socio-economic status to name a few. Health experts and various organisations endorse breastfeeding as the best strategy to enhance child health and to reduce child morbidity and mortality as it provides all the essential nutrients (Ijumba et al 2014). There is however a gap between what mothers or primary care givers know and what they actually do and the reasons behind the behaviour is not well documented for in certain population groups and geographic locations. The aim of this study was thus to describe the feeding practices of infants aged 0 to 12 months.
and to explore the knowledge levels and decision making influences of the primary care givers of these infants.

Methodology
The sample included 60 primary care givers, with approximately 50% of them the biological mothers, accessed through a local public health clinic, while other primary givers included mainly grandmothers or paid child minders. The study followed a qualitative approach with in-depth interviews with the conveniently sampled mothers or other primary care givers. The interview schedule included questions on demographic characteristics of infants, mothers and other primary care givers and socio-economic characteristics of the mothers. In addition to this, extensive interviewing was done on current and former breast feeding and formula feeding practices as well as introduction of liquids and solids. The interview schedule also explored the role of various factors such as family, traditions, knowledge, health care professionals and other sources of information in the decision making around the feeding of the infant.

Results
Sixty primary caregivers were interviewed, thirty-two of them were biological mothers of the infants and twenty-eight were other caregivers. Preliminary results show that most of the mothers (78.3%) initiated breastfeeding within the first hour. At the time of the study, twenty-four mothers had breastfed the infants exclusively for different periods of time and some were still practicing exclusively breastfeeding. Twenty-three mothers applied suboptimal breast feeding, either breast feeding for a short period of time and then switching to formula or practicing mixed feeding. Thirty-nine caregivers introduced liquids, of whom twenty-six did so before their infants were six months old. Forty-four caregivers introduced liquids and solids, of whom twenty-two did so before their infants were six months old. The mothers who breastfed obtained information primarily from the public health clinic and twenty-one caregivers who introduced infant formula obtained information from relatives or health care practitioners at the clinic. Health care professionals and relatives were also influential in the introduction of liquids and solids in about 50% of the cases. Thirty-five caregivers obtained advice mainly from the grandmother of the infant in combination the professionals at the clinic. The majority of the infants were reported to be of normal weight according to their growth charts regardless of the feeding practiced.

Conclusions and Recommendations
It was evident from the study that primary care givers follow a range of infant feeding practices for many different socio-economic reasons, and that the duration of breastfeeding is often short and that solid foods are frequently introduced at an early stage. Care givers are influenced in their decision making around feeding by different combinations of factors or which close family members and health care professionals at clinics proved to be the strongest influences. It is essential that exclusive breastfeeding should be promoted as optimal but that it should be accompanied by accurate information on other acceptable practices where breastfeeding cannot be exclusively practiced for at least the first 6 months. Health care professional as strong influencers should be well trained to provide correct and timely information. In addition to this, there is room for educating of mothers, grandmothers
and other caregivers on different infant feeding practices and the promotion of the consumption of indigenous and locally available nutritious foods.

References

1972 Food consumption patterns in two rural wards in UMkhanyakude District, KwaZulu-Natal

Ms T.P Kheswa, Ms Z.H. Mfono, Prof U. Kolanisi, B.M. Selepe & Prof M. Siwela, University of Zululand

KheswaT@unizulu.ac.za

Key words
Food, consumption, rural, KwaZulu-Natal

Introduction
Dietary intake patterns in South Africa have changed dramatically over the past decades and this is likely to continue over the coming years (Ronquest-Ross et al., 2015). The choice of food is influenced by geography, season, education, government and other support services, urbanisation, globalization, marketing, ethnicity, social networks, time and the consumer (Wenfold et al., 2012). Since 1994 food consumption patterns of South Africans have been radically affected by availability, accessibility and choices. The current nutrition transition in South African is associated with a shift in dietary patterns away from fibre and micronutrient rich staple foods, legumes and vegetables and increasing animal food intake and energy dense convenient foods favouring the observed double burden of micronutrient deficiency and non-communicable diseases (Vorster, Badham and Venter, 2013).

KwaZulu-Natal has the second highest prevalence of obesity at 39.2% in women and 10.6% in men (Shisana et al., 2013). More than half, (65.5%) of households in UMkhanyakude district, North of KwaZulu-Natal, experience food insecurity (D’Haese et al., 2013). The aim of the study was to describe the consumption patterns of adults in two rural wards in Hlabisa Big 5 municipality.

Methodology
Two rural communities Makhasa and Mnqobokazi were selected for the study. Sixty three (63) participants were recruited through a convenient sampling method based on availability, participation in garden projects and other development projects. A 24 hour dietary recall was collected from the participants. Data was analysed using Excel computer program for descriptive statistics.
Results

Fifty two (83%) participants reported that this was their usual intake. The results were pooled and categorized into three consumption groups: least consumed (< once/day), average intake (2-3 times/day) and most commonly (> 4 times/day) consumed foods. Maize meal in various forms remained the common staple consumed throughout the day. Sugar sweetened mineral drinks were commonly consumed. Green leafy vegetables (imifino) were commonly consumed while fresh maize, amadumbe, beetroot and potato chips were least. Pumpkin and potato were moderately consumed. Apples were the most commonly consumed fruit, followed by banana, guava and orange. Fats/oil/margarine intake was commonly consumed, while use of mayonnaise and avocado was least consumed. Fish, beans, groundnuts and chicken were the common protein foods. Milk, eggs, polony and peanut butter were least consumed.

The typical meal pattern consisted of two larger meals namely, the breakfast, consisting of a meal rather than light starch/cereal. Forty five percent of the total sample skipped lunch. For some participants, the mid-afternoon meal was heavy in which case no supper would be eaten, thus 17/63 (27%), did not take supper.

Conclusions and Recommendations

The most consumed foods were maize meal, sugar, tea and brown bread, while milk was lacking in the diets of respondents from both communities. The low intake of milk and sour milk is in conflict with the South African food based dietary guidelines to “have milk, maas and yoghurt daily” (Vorster, Badham and Venter, 2013). The intake of processed carbohydrates and processed high salt meat (polony) was noted. This needs to be further investigated. Lack of variety in vegetable consumption, may lead to limited micro nutrient intakes. Moderate consumption of exotic vegetables such as potato and pumpkin, while beneficial, needs to be complemented by encouraging consumption of indigenous starch tubers (sweet potatoes, cassava), vegetables (traditional leafy vegetables) and wild fruits (monkey apples) that are abundant in the area. These food consumption patterns indicate that these rural communities are in nutrition transition. Identification of locally available nutrient dense food sources can increase the food base for participants. In this particular area, indigenous crops have the potential to can bridge the gap and contribute to improving dietary diversity (Govender et al., 2017).

References

Key words
Food knowledge, health promotion, lifestyle habits, nutrition awareness

Introduction
Healthy food decisions and lifestyle habits are essential to address the obesity crisis. The negative impact of growing numbers in overweight and diabetes on public health globally is alarming. Increasing numbers of pre- and school-age children are overweight or obese (WHO, 2018). These conditions are mostly preventable, and the promotion of healthier food decisions as part of healthier lifestyles needs urgent attention.

Increased knowledge of healthy food and nutrition support healthier food decisions. Health-aware consumers primarily use claims, nutritional content and ingredient information to choose foods (Mhurchu et al., 2017). Several studies highlight the importance and positive effect of marketing of healthy foods to enhance awareness and purchases of healthy foods (Goh et al., 2017; Gustafson et al., 2018). Mandatory legislation towards restrictions on specific nutritional components (sugar, salt, and trans-fats) in processed foods acts as governments’ role in addressing non-communicable diseases (Kaldor, 2018). It is, however, clear that knowledge of healthy foods does not necessarily translate into healthy food choices and lifestyle habits. This study thus aimed to determine the association between consumer’s healthy food and nutrition knowledge and healthy lifestyle habits.

Methodology
We used a quantitative cross-sectional survey design to obtain data from respondents from urban corporate settings (N=157). Respondents electronically completed questionnaires including an adapted version of a healthy lifestyle habit questionnaire, as well as questions on their subjective and objective knowledge regarding healthy foods using 5-point Likert scales.

Results
Although most lifestyle habits (where 1=never; 5=always) were only “sometimes” employed, findings showed that respondents focussed more on lifestyle habits regarding food/nutrition, sleep and non-smoking, while neglecting habits of relaxation, recreation, and exercise. On average respondents’ subjective knowledge (i.e. what they think they know) were good (3.59) (i.e. “agree” - where 1=strongly disagree; 5=strongly agree). Their objective knowledge revealed reasonably good knowledge of sugar and the negative effect of too much salt. However, lower knowledge for weight and cholesterol related questions revealed lacking knowledge of sources of fats seen as good or bad fats. Healthy lifestyle habits showed a clear correlation between subjective knowledge and three identified lifestyle habit factors namely,
healthy food habits, physical activity or relaxation and dedicated efforts (r=0.40, r=0.37, r=0.38 respectively). However, lifestyle habits and objective knowledge did not correlate.

**Conclusions and Recommendations**

This study confirmed that subjective knowledge of respondents in this study and healthy lifestyle habits relating to their belief of healthy food choices, their dedication to follow these lifestyles and to be involved in physical activity or relaxation. These factors should be present in combination with sound knowledge regarding healthy foods to ultimately to make healthier and more informed food decisions.

Similar to alcohol and cigarette campaigns regarding health hazards associated with these particular lifestyle-related products, the media should be used to convey explicit messages regarding healthy foods to consumers. It is further essential the information must be precise and scientific evidence-based.

**References**


---

**1984 A systematic desk review of food taboos that affect expectant and lactating mothers as well as infants' wellbeing**

Dr K Phuthi, Masiyephambili College

kphuthi2007@yahoo.com

**Key words**

Taboo, cultural practices, nutrition, expectant mothers, lactating mothers, foetus, infants

**Introduction**

Food taboos that affect expectant and lactating mothers and infants are one of the causes of malnutrition and food insecurity in sub-Saharan Africa (Ekwochi et al, 2016 & Ugwa, 2016). A larger research that was conducted by the author revealed that adolescents and young women (10-24) were particularly adherent to culture and more affected by the negative impacts of cultural practices. Most of the food taboos negative outcomes for expectant
mothers like failure to deliver, mother growing too big and heavy bleeding during birth (Mangeshe & Ayele 2015 & Zerfu, Umeta &Baye, 2016). Infant food taboos are adhered to because of the perceived consequences, e.g., eating eggs at a tender age will cause the baby to steal when grown up and many other taboos. According to Asi and Teri, (2016:35), food taboo is ‘an unwritten order or declaration by the head of a community...that makes certain objects sacred to the members of the society’. The orders are adhered to because they are taken seriously by the communities and are passed on from generation to generation. Taboos’ persistence demonstrates their importance and cannot therefore be changed overnight (Getnet, Aycheh & Tessema, 2018 and Reddy & Anitha, 2015:613). It is indeed unfortunate that studies confirm that most taboos hinge on nutritious foods like eggs, fish, meat, milk which are good sources of high biological value protein, a nutrient needed for the foetus and infant’s rapid mental and physical development (Alonso, 2015; Chege, Kimiywe & Ndungu, 2015; Ekwochi et al, 2016 and Tahir, Ahmed & Mohamed, 2016). This review sought to investigate the drivers of taboo adherence and the nutritional effects of adhering to food taboos for expectant and lactating mothers and infants

Methodology

The researcher used the keywords and abstracts to identify and search primary scholarly journal articles on food taboos. The inclusion criteria were articles or with chapters on food taboos for expectant and lactating mothers as well as babies and infants. Only journal articles published between 2015 and 2019 were included for the review so as to capture the most recent and relevant findings. Articles on food taboos for non-expectant or lactating mothers and older children were excluded from the review. Journal articles that are more than five years were also excluded. The researcher screened journal articles for relevance of information on food taboos. Seven articles that reported negatively and three positively about food taboos were reviewed to minimise bias. A total of ten journal articles with studies conducted in Africa met the inclusion criteria and these were reviewed until themes were repetitive, showing that there was no more new knowledge on the subject. The findings from different sources were qualitatively analysed and synthesised to come up with themes.

Findings

Published evidence confirms that the main reasons why expectant and lactating mothers adhere to food taboos is because of traditional and cultural beliefs, fear of rejection by the community, education level, socio-economic standing and perceived misconceptions of the threats to the mother and the baby. The food taboos contribute to the prevalence of malnutrition among expectant and lactating mothers as well as infants less than 2 years old. On the contrary, some studies found that while food taboos were negative and prohibitive on food consumption, they bring a sense of unity, identity and belonging among the community.

Conclusions and Recommendations

The reviewed literature concluded that women and children’s nutritional status is affected by food taboos that leave them with a diet of thin or thick porridge. It is recommended that young mothers be taught the importance of nutrition at the pre and post natal clinics, church women’s fellowships, at community gatherings and in lessons for Education for Living at schools. This systematic review will culminate in the development of a teaching manual that
is culture sensitive to the nutritional needs of expectant and lactating mothers and infants of up to two years old. A study that covers more countries in the continent is recommended so as to evaluate the extent of the effects of food taboos on African mothers and infants’ nutritional status and open avenues for protracted education on nutrition.

References
Alonso, E.B. 2015 The impact of culture, religion and traditional knowledge on food and nutrition security in developing countries. Food secure for policies that matter. Interdisciplinary Research Project.
Accessed on 20/09/19

1993 Mothers’ Nutritional Knowledge in South Africa: The Greatest Ally for Children’s Healthy Eating

Mrs Y.C. Majija, Prof E.L. Kempen & T. Van Eeden, Walter Sisulu University
ymajija@wsu.ac.za

Key words
Mothers, nutrition, knowledge, children, health

Introduction
Mother’s nutrition knowledge, that guides children in developing healthy eating patterns, received relatively little research attention than needed in South Africa, and yet they (mothers) have fundamental role in promoting a healthy eating behaviour in children,
especially during the first five years of life (Smit, Kassier, Nel, Koen; 2017). More so, there are no structured institutions in South Africa (SA) for knowledge transference to a woman to become a mother. Notwithstanding the absence of such institutions, mothers have, however, always fulfilled their parental role of providing children with food they consider as nutritional/ healthy. This paper explores mothers’ nutrition knowledge in relation to eating habits of children in Mthatha, Eastern Cape.

Methodology

350 mothers were conveniently and purposefully sampled from OR Tambo District health centres. Sampling mothers at health facilities served as a proxy for sampling mothers from the general population. Cross sectional exploratory survey design was adopted. Self-administered questionnaires included questions related to healthy eating, food practices, food hygiene, identification of snack items, water intake, food choice and food preparation techniques statements. Data collected incorporated the SA FBDG. Data were analysed by Statistical Packages for Social Sciences (SPSS) 26.0, for descriptive analyses as well as Factor Analysis which reduces observed variables and Cronbach’s alpha for internal consistency reliability.

Results

Six factors extracted were related to i) Knowledge of healthy food and lifestyle with construct mean scored 1.73, close to 2, which reflects a positive perception of what constitutes healthy food and a healthy lifestyle. This can be interpreted as respondents being knowledgeable about healthy food choices that may also include an understanding of the nutritional value of healthy food; ii) knowledge of unhealthy food and lifestyle; iii) nutrition knowledge gap iv) distinctive healthy choices; v) knowledge of healthy limits to general health knowledge and vi) factor 6 which refers to food custom deviation for which a higher mean construct score was reported, namely 3.66. This score approximates to the value of 4 which suggests a negative perception of these habits. They were perceived resulting in customary practices being challenged with better informed choices. It can be concluded, from the descriptive statistics, that the majority (73%) of respondents understand healthy eating and nutrition related opinions explored in this study. Although they understand healthy eating and nutrition related opinions contradicting responses appeared on FBDGs knowledge statement. All (100%) respondents revealed that they do not know FBDGs, but they had an idea of what and how to prepare meals for their families/children.

Conclusions and Recommendations

Based on these results, it is recommended that there should be collaboration of consumer science educators and health practitioners to encourage and equip mothers to implement healthy eating strategies as well as to promote healthy lifestyle. Policies and interventions to address inadequate early nutrition as well as high-energy, unbalanced nutrition should be developed to address malnutrition, particularly targeting women, as the knowledge given to women may be a powerful weapon against malnutrition.
1994 The influence of food handlers’ menu planning competencies on the nutritional quality of meals in the Gauteng school nutrition programme

Dr T. Berejena, Prof I.C. Kleynhans and Dr S.P. Vibetitis, Tshwane University of Technology
tendai.berejena@gmail.com

Key words
School Nutrition Programme, food handlers, nutritional quality

Introduction
The main aim of this study was to assess the influence of menu planning competence levels of food handlers on the nutritional quality of meals served in Gauteng school. The study was necessitated by the persistent complaints on the nutritional quality of meals served in the National School Nutrition Programme (NSNP). A study by GresseNomvete and Walter (2017:24) revealed that portions served in several NSNP schools are below the 2400kj of energy or 30% of the RDA of 8000kj prescribed for the growth and development of a school child. A similar report was published by the Department of Planning, Monitoring and Evaluation (DPME) and the Department of Basic Education (DBE) (2016:31) that incorrect quantities of food groups are prepared and served in some of the NSNP schools. Furthermore, Nhlapo, Lues, Kativhu and Groenewald (2015:9) revealed that meals served in some of the NSNP schools did not meet the nutrient requirements for carbohydrates, energy contents, calcium and zinc.

Methodology
A mixed method approach in form of convergent parallel design was adopted in this study where both quantitative and qualitative research techniques were used. The sample for this study consisted of 290 secondary schools offering the NSNP in all the 15 districts of Gauteng. Probability sampling was used at each school to identify 1 nutrition teacher coordinator who became part of a sample. Typically, probability sampling in this study was employed in the form of random sampling. All the 15 district nutrition coordinators also became part of the sample.

A structured questionnaire was administered to the 290 nutrition teacher coordinators while the 15 district nutrition coordinators were interviewed to validate the responses from the questionnaire. On the questionnaire, questions on the menu competency abilities of the food handlers were rated on a Likert scale on which 1 is ranked as strongly disagree, 2 as disagree, 3 as neither agree nor disagree, 4 as partially agree, 5 as agree and 6 as strongly agree.
Descriptive statistics was used in quantitative research to describe a single variable in the research population whilst qualitative data analysis was in a narrative form to describe findings from the interviews. Pearson Chi-Square for independence was used in the study to ascertain the relationship between menu planning competence levels and the nutritional quality of meals. The Cronbach alpha coefficient score was 0.9721, reflecting a good internal consistency of the items in the questionnaires.

Results

The analysis of the research showed that from a sample of 290 nutrition teacher coordinators, a significant number (69.65%, n=202) disagreed that the food handlers can follow the menu planning guideline accurately as stipulated by the DBE. Only (11.73%, n=34) of the respondents agreed whereas (9.31%, n=27) partially agreed. The responses indicate that the participants felt that the food handlers had very little knowledge required to adhere to the NSNP menu guidelines. To validate the responses from the questionnaire, the most frequent comments from the interviews were as follows:

- Most of the food handlers have got low literacy levels and it is difficult for them to understand nutritional issues.
- They cannot follow menu planning guidelines. Meals cooked in some schools are not balanced.

A relationship test between menu planning competence levels of food handlers and the nutritional quality of meals served scored Chi-Square p-value 0.000, therefore (p-value < 0.05), thus suggesting that the nutritional quality of food served is influenced by the ability of the food handler to follow menu planning guidelines. This finding is consistent with the views of Legbara and Selepe (2017:70) who concluded that appropriate meal planning for unknowledgeable food handlers remains a challenge in the NSNP. Gresse et al, (2017:24) share a similar view that the poor nutritional quality of meals in the NSNP can also be attributed to both poor menu planning abilities and the lack of culinary proficiency in the food handlers.

Conclusions and Recommendations

It is therefore recommended that the DBE should continuously identify and evaluate the training needs of the NSNP food handlers. The element of nutrition education and menu planning should be infused in the training framework of the NSNP food handlers. The Department of Health should intervene in the NSNP through incorporating qualified personnel to monitor the nutritional aspects in the preparation of school meals.

References


**1996 Food security status of households in Daveyton, a South African township**

*Dr A.O. Agyepong & Prof M. Linington, Unisa*

agyepao@unisa.ac.za

**Key words**

none provided

**Introduction**

Household food security is a predicament facing the world at large, including South Africa. Although South Africa is nationally self-sufficient in food supply, many households are vulnerable to food insecurity. Natural disasters, population growth, low agricultural development, food prices, income inequalities, poverty and health issues are some of the main causes of household food insecurity in the world and in South Africa.

**Methodology**

The aim of the study is to determine the food security status of households in the South African township of Daveyton. The research methodology was in two-fold; firstly, a literature review was undertaken to provide a theoretical perspective on household food security. Secondly, a self-administered questionnaire using the household food insecurity access scale (HFIAS – A USAID tool) was administered to 240 households to complete.

Data will be analysed using the HFIAS model to determine the food security status of households in Daveyton. In addition, to the HFIAS model, a logit regression model will be used to estimate the socio-economic and demographic variables that determines food security status of households.

**Results**

The results of the study will inform a community engagement (CE) initiative that has been established by the College of Agriculture and Environmental Sciences (CAES) in UNISA. Unlike previous CE projects which begins and fizzles out, CAES intends to fully incorporate sustainability into this new project hence the community’s food security status needed to be assessed.

**Conclusions and Recommendations**

None provided
1956 Food preservation and processing in rural households in the Sekhukhune District in Limpopo Province, South Africa

Dr M. Masekoameng, Unisa
masekmr@unisa.ac.za

Key words
Indigenous knowledge system, food preservation, food processing, food security

Introduction
Africa is faced with dire food security challenges. Although Africa is considered the continent with the most arable land that is rich in mineral resources, which can feed its population, it still remains the most impoverished continent in terms of food security (Asogwa et al., 2017). High post-harvest losses, arising largely from a limited food preservation capacity, play a major role in terms of food and nutrition security in southern Africa. This is particularly evident in the Sekhukhune district in the Limpopo province, South Africa. According to Asogwa et al. (2017), a greater portion of food loss is due to various factors such as poor infrastructure, a lack of technology, low investment in food production systems, pests, inadequate policies, a lack of appropriate storage facilities and climate change. Indigenous knowledge (IK) is important because it is often the only asset for many poor, rural societies and its significance increases as other resources disappear or dwindle. Indigenous knowledge refers to what indigenous people know and do, and what they have known and done for generations. It also refers to practices that have evolved through trial and error and it provides flexible ways to cope with change (Melchias, 2001). It can also be considered an unwritten body of knowledge; it is held in different brains; languages and skills, in many groups, and cultural environments (Asogwa et al., 2017). Indigenous people have developed indigenous practices and technology for the storage, preservation and processing of food. It is against this background that this paper was written. The main objective of this paper was to identify the rural food preservation and processing techniques practiced in the Sekhukhune district in the Limpopo province, South Africa, with reference to the communities’ indigenous knowledge systems (IKS) as a paradigm and its contribution to food security. The paper explored how rural households preserve and process their food with examples drawn from the Sekhukhune district. The provision of food crops, both wild and cultivated, fruits, and vegetables, and animal husbandry, are the survival strategies of the rural people, which provide them with household food and nutritional security.

Methodology
Qualitative data was collected using focus group discussions from small-scale farming households in seven villages namely: Eladskrall, Mogaladi, Mabitsi, Mmakgtale, Mohlalaotoane, Tsimanyane and Vallbank. Participatory Rural Appraisal (PRA) and Rapid Rural Appraisal (RRA) (Chambers et al., 1989; Masekoameng, 2007) were used to collect the data. The following tools were used to collect the data: photographs, village resource mapping, village social mapping and seasonal calendars. Furthermore, focus groups,
informants such as extension workers and headmen in all villages were consulted using checklists.

Results

The results highlight the role of women in food processing and preservation. Furthermore, their food preservation and processing combat hunger, achieve food security, improve nutrition and promote sustainable livelihoods. Food security in the form of availability and access was attained through indigenous food gathering, production and harvesting. The most prevalent methods used for food preservation were sun drying and fermentation. The most prevalent methods used for vegetable processing was washing, cooking, mashing, shaping vegetables into small pellet-like shapes and sun drying them for preservation. Crops such as mung beans, Bambara ground nuts, millet, and sorghum were threshed, winnowed to remove all the impurities, and sun dried. The seeds were treated with aloe ash to prevent pest infestation.

Conclusions and Recommendations

This paper concludes by highlighting the existing knowledge that the rural households demonstrated in terms of food processing and preservation. It is crucial to emphasise the nutritional value of indigenous foods and to find ways of retaining nutrients during preservation to prevent nutritional loss and ensure household food security. Therefore, it is recommended that new affordable food preservation and processing technologies be introduced to rural households to supplement the indigenous methods. The process could be facilitated through the extension programmes and any community development services. The role of both public and private sector will be acknowledged in this regard. Finally, Sustainable Development Goal number 2 of ending hunger, achieving food security, improving nutrition and promoting sustainable agriculture was achieved through food gathering, production, processing and preservation.

References

Introduction

There is an increase in consumption of natural fruit juice as an alternative to the traditional caffeine-containing beverages such as coffee, tea or carbonated soft drink. This may be attributed to consumer consciousness about the beneficial contribution of food to their health. Watermelon (Citrullus lanatus) is a nutritional beverage containing essential minerals and amino acids. In addition, it contains lycopene, ascorbic acid, β-carotene and polyphenols as antioxidants against inflammation, and certain cancers. Therefore, the dietary intake of watermelon juice can significantly improve human health and well-being. It can result in the reduction or prevention of chronic diseases such as cardiovascular diseases, various cancers, diabetes and hypertension. However, the antioxidants content of watermelon juice is affected during the maturation stages as it undergoes some chemical changes. As a result, monitoring these quality properties during maturity is becoming very important since the state of maturity during harvest, storage and market distribution determines the quality of the product that meets the customer’s satisfaction. The aim of this study was to investigate the changes in major antioxidants of commercial watermelon (Sugar baby) cultivar grown in an open-field and harvested at three different stages harvested at different maturity stages (unripe, half-ripe and fully-ripe). It was hypothesised that stages of maturity affects the antioxidants properties of watermelon fruit juice. The watermelon fruits were cut into slices; the rind and the seeds were separated from the flesh.

Methodology

The flesh was put in the table juice extractor (Russell Hobbs Juice Sensation Model no: RHJM01. 220-240 V - 700 W, UK) to extract the watermelon fruit juice and packaged in 50 ml polyethylene. The analysis of the antioxidants were done using the HPLC (Model RD-20A, Japan) and a UV-VIS spectrophotometry (ThermoFinnigan/ FinniganMAT, San Jose, CA, Bremen, Germany).

Results

At the unripe stage, the lycopene content was 0.04 mg/100 g but increased as the ripening process progressed, a significant increase in lycopene content (3.9 mg/100 g) (half-ripe) was observed. As the maturation reached the fully-ripe stage, the watermelon juice exhibited a significantly higher value of lycopene content (6.19 mg/100 g). No β-carotene was detected at the unripe stage; however, it increased linearly to 0.12 and 0.23 mg/100 g at half-ripe and fully ripe stage respectively. Ascorbic acid was very low at the unripe stage (1.3 mg/100 g) but
linearly increased with the ripening process until 3.47 mg/100 g at fully ripe stage. Total polyphenolic content also showed an increasing trend with maturity.

Conclusions and Recommendations

It appears that maturity does not have a negative effect on quality parameters of the watermelon juice. The increase in antioxidants during maturity may be attributed to progressive activation of the molecular mechanisms involved in carotenogenesis regulation during the transition and also due to the decrease of chlorophyll. Ethylene and enzyme activity might be playing a role in fruit maturity of cultivated watermelon. The results of this study suggest that consumption of watermelon juice can contribute significantly towards human health due to the amount of antioxidants at ripe stage. Furthermore, the presence of these phytochemicals enhances its potential use as a functional ingredient in food application.

References

- 1969 The effect of Amaranthus leaf powder addition on microbial safety and Consumer acceptability noodles

  N. Qumbisa, N. Ngobese, U. Kolanisi & M. Siwela, University of Zululand
  kolanisiu@unizulu.ac.za

Key words

none provided

Introduction

Pasta and pasta products are among the most popular carbohydrate rich staple foods that are currently being consumed (Wood, 2009, WINA, 2017). Its convenience and cost effective price attributes are major contributors towards its wide acceptance (Sikander et al., 2017, Adegunwa et al., 2012). Instant noodles are also widely consumed, however, there is a concern in terms of the adequacy of nutrients obtained from instant noodles especially when consumed as a single food item (Annigan, 2018, Huh et al., 2017, Sikander et al., 2017). It is important therefore to look into alternative ways to supplement them in order to improve their nutritional value. Food safety and consumer acceptability however are some of the important factors to consider when developing a product. The issues of food safety have become a major concern at a global scale and developing countries have recently over the years’ experienced a series of outbreaks that are associated with food borne illnesses (Beuchat et al., 2013). These are as a result of the presence of food borne pathogens in low water content foods such as spices, dry nuts, chocolates, infant and adult cereals as well as milk powder (Beuchat et al., 2013). Microbial quality of pasta and pasta products are related to the characteristics of raw materials and methods used during production (Costa et al., 2010). To meet consumer demands for increased eating quality and diverse functionality of food, there are many additives that have been developed and used for pasta and noodle
products. The consumer’s assessment of food is not only focused on the nutritional benefits or the health impacts but also sensory attributes have a direct impact on the desire to buy or preference of the product (Martins et al., 2016).

The aim of the study therefore, was to supplement noodles with Amaranthus leaf powder and determine the effect on microbial safety consumer acceptability of noodles.

**Methodology**

Instant noodle prototypes were developed by substituting the wheat flour used in a common noodle recipe with 1, 2 and 3% ratios of Amaranthus leaf powder. The wet noodle strands were oven dried at 70º for 2 hours until completely dry. 200 g of the dried sample was cooked using 500ml of boiled water for 10 minutes until soft and cooked. Consumer acceptability was assessed by 60 untrained panellists using a 9-point hedonic scale. To verify the actual bacterial quality of the samples. All the glassware used were firstly autoclaved to ensure that are sterile before use. To verify the presence of microorganisms in the food sample a method as described by Akhigbemidu et al. (2015) was used.

**Results**

The overall acceptability for instant noodles with 3 % ALP was mostly liked by the panellists. This suggests that the addition of ALP to the instant noodles did not compromise the overall acceptability of noodles among students although the acceptability of the colour of this sample was lower than the other samples. The texture of the 2% ALP-supplemented noodles was the most acceptable, although all other samples were similarly acceptable. The aroma for sample with ALP was neither liked nor disliked by panellists, similarly with the control. The prototype with 3% ALP got the lowest score for taste. All the three samples i.e. V1, V2 and V3 had cfu/ml of six at the dilution factor 10-3 while the control had four cfu/ml at the dilution factor of 10-1 and no growth was observed in the control as the dilution factor was increased. All the three samples i.e. V1, V2 and V3 had cfu/ml of six at the dilution factor 10-3 while the control had four cfu/ml at the dilution factor of 10-1 and no growth was observed in the control as the dilution factor was increased.

**Conclusion**

There is a potential for the product to be widely accepted by the population however the product still requires improvement in terms of taste and flavour. The identification of the exact species and strains of the microorganisms is done so as to determine whether the microbes present are pathogenic or not is still in progress and will be reported later on this year.

**References**

ANNIGAN, J. 2018. The effects of low protein intake” Healthy eating. SF Gate.
1913 Smallholder irrigation scheme farmers’ performance in Tshiombo irrigation scheme
Limpopo province, South Africa

Mr L.M. Mwadzingeni & Prof P.L. Mafongoya, University of Kwa-Zulu Natal
libomwadzi@gmail.com

Key words
Economic incentives, financial performance gross margin, institutions

Introduction
Smallholder irrigation farming has received international recognition for playing a pivotal role in reducing hunger; ensure food and nutrition security, improving the welfare of rural communities, and generating employment. In South Africa, smallholder irrigation farming is the scope for rural communities. Reports on smallholder irrigation schemes across the globe.
highlighted their low performance. Focusing on the performance of scheme farmers will ensure economic and financial sustainability of scheme for a better welfare of the current and future generation. This study focused on the performance of farmers in Tshiombo irrigation scheme, located in the Limpopo province of South Africa.

Methodology
This study encompasses administering of structured questionnaires, focus group discussions (FGDs) and key informant interviews (KIIs). A representative sample of 148 farmers was selected randomly and interviewed. Categorical data and numerical data were collected from the sample population. Gross margin of crops grown in the scheme was employed as a performance indicator in relation to this study. Ordinary Least Square (OLS) with gross margin for sweet potato, which is the main crop grown in the scheme was used to estimate factors that affect the financial performance of scheme farmers.

Results
The study identified cabbage as potential crop with higher gross margin compared to maize and sweet potatoes which are main crops grown the scheme. Age of farmers, labour availability, size of cultivated land, pesticide subsidy, market price and distance of the plot from main canal significantly impacted gross margin with a margin of -0.022, 0.185, -0.13, 0.138, 6.09 and 0.191 respectively.

Conclusions and Recommendations
Focusing on encouraging young farmers to join scheme farming by increasing economic incentives like high market prices for produce and providing them with irrigation plots will improve scheme performance and sustainability. Moreover, subsidies that are provided to scheme farmers should relate to farmer’s production needs like pesticide by enquiring from them.

References
1979 Sustainable livelihoods through indigenous knowledge systems’ informal based financial saving schemes: A perspective on stokvels in Umkhanyande District, South Africa

Dr S. Sabi & Prof U. Kolanisi, University of Zululand
SabiS@unizulu.ac.za

Key words
Community engagement, indigenous knowledge systems, stokvels, small entrepreneurship, Ubuntu

Introduction
Post 1994 South Africa has witnessed an increasing level of a collective informal financial saving schemes known as stokvels. The rationale for stokvels could be linked to survival strategies to mobilize financial resources which were initiated by the disadvantaged black population to cope with the racialized economic and class oppression of the apartheid regime. Among black South Africans, stokvel groups were formed to respond to the problems of poverty and income insecurity in their communities Mboweni (1990). With an estimated 50% of black adult South Africans being members of at least one stokvel group, stokvels are an informal financial saving schemes amounting to an estimated 800 000 groups, generating an estimated R49 billion annually (University of Cape Town, 2003; National Stokvel Association of South Africa, 2019). Despite that a large number of South Africans belong to stokvels, there is lack of documented knowledge regarding their viability particularly in Umkhanyande District.

Theoretical Framework: To analyse the viability of stokvels in South Africa’s rural communities of umkhanyande district of KwaZulu-Natal province, the study is guided by the theoretical perspective of Sustainable Livelihood Framework.

Methodology
Through a phenomenological approach, the qualitative study uses informal interviews and a review of relevant literature to interrogate the subject.

Findings
The study revealed that most individuals have been members of at least one stokvel for more than five years. Due to high poverty levels in the area, stokvels are safety nets for the poorest and the vulnerable households which otherwise would have struggled to cope with shocks and/or make their ends meet. As perceived by the respondents, stokvels are ‘user friendly’; no formal registration or membership fee is required; depending on the circumstances, a member can belong to multiple groups. Of note is that, the respondents cited ‘trust for one other’ or loyalty regarding their financial savings, has key to the viability of a stokvel. Furthermore, stokvels have significant social impact on the members—they become friends, communicate regularly and support each other in terms of need. To many, this serves as motivation for their membership.
However, some possible limitations to the viability of the stokvels groups are also identified in study. Largely, due to their perceived ‘trust on membership’, and being a very remote based area, most stokvel groups do not save their income in the bank, they hide the money in their homes which, poses a risk to theft as explained by few members who had experienced theft at some point. Ultimately, it can compromise the sustainability of their capital and livelihood.

**Conclusions and Recommendations**

Despite some risks of financial theft, stokvels are largely viable as evident in the underlying motivation for membership, their existence for some years and the positive socio-economic impact on the members, their communities and the nation in general.

The study contributes to the discourse on viability of informal financial sector in rural communities of a developing country. This study also, advocates and emphasises sustainable livelihoods of poor African population through the informal financial saving schemes-stokvels. Likewise, it documents the perspectives of the local communities about indigenous operations of stokvels in their vicinity and the contribution to the national economy.

**References**


115
6. HOSPITALITY MANAGEMENT

1951 Hotel choice attributes of business and leisure travellers in Cape Town

Mrs M.P.M. Matondolo & Dr T. Nyathela, Cape Peninsula University of Technology
pmaleb@gmail.com

Key words
Hotel choice attributes, business travellers, leisure travellers, hotel selection

Introduction
Despite years of research, how guests choose hotels to stay in remains relatively minimal (Dolnicar, 2002:34). While the hotel industry cater for all market segments, from low budget to ultra-luxury segments (Baruca & Čivre, 2012:76-77), travellers also make hotel choices based on different attributes such as level of service, price, or location. The onus is now on hotel owners to acquire the knowledge of what attracts customers, whether business or leisure, to their hotels. Hotel owners could provide better service for their guests/travellers if they knew what guests prefer and why these guests visit hotels. Therefore the aim of this study is to examine the different attributes that influence guests when hotel selection in Cape Town.

Methodology
A quantitative research approach was used for this study whereby a questionnaire was used to gather information from the hotel guests. Non-probability sampling method, a convenience sample method was applied. The study included the hotels that were willing to participate from targeted the hotels in the geographical areas of Victoria and Alfred Waterfront, Sea Point, the City Bowl, Cape Town Central Business District (CBD) and Green Point, in Cape Town. The study selected guests who were willing to partake in this study. Data has been captured and analysed using the SPSS (version 26.0) and it will be presented using descriptive statistics (in the form of tables and graphs).

Results
The preliminary results are being presented for this conference as I am still busy with data collection. Seventy (70) questionnaires have been completed thus far. The questionnaire was divided into two sections, namely, socio-demographics and guest attribute. The purpose of the socio-demographics was to determine the profiles of the guests participating in the study. This will assist in breaking down the overall response data into meaningful groups of respondents. Guests’ attribute determined which attributes are important when making hotel choices. The socio-demographic his study shows that 50% of the respondents are regular with the highest percentage (90%) indicating that most are males between the age (35 and 54). The study shows the majority (93%) of the participants from South Africa. The
travel type obtained from this study was mostly business & leisure (53%). Among the hotel attributes examined, the following are shown to be more significant, safety and security (70%) followed by staff responsive to guest needs (69%), efficient service provision (69%) cleanliness of the room (67%), and then room comfortability (67%). Further the results indicated that the quality of food (49%) and staff recognition of guests (46%) were important attributes. Business centres (51%) and wireless connection (44%) are significant attributes to business travellers as well as convenient locations of the hotel (54%), value for money (53%).

Conclusions and Recommendations

Based on these results, managers can also intelligently target the hotel attributes that are shown herein to have more importance. As these choices play an important role in the high costs that are typically involved with investments in the hotel industry, knowledge of customers’ preferences is essential. The investigation into the reasons for hotel accommodation choices by customers is essential as such knowledge allows managers to make decisions which lead customers to return to particular hotels. The findings are particularly valuable to the current hotel owners and the future owners because the listed attributes are things they can be in control off. These results provide hotel managers with a chance to update their beliefs on the relative importance of the attributes for their target segment, and to focus on those aspects that are perceived to be more valuable. In addition, these results may be used to attract customers from other types of properties as well as to maintain satisfaction levels for current customers. This study does not only bring benefits to the current hotel owners but will also provide guidelines to future hotels to understand the motivation, attitudes and valued attributes that shape consumers’ opinions before establishing new hotels. Due to different results from few studies on how guest choose hotels, this study allows future researchers to examine the reasons these attributes are so important to them. Further research that enquires into the reason may help hoteliers to come up with alternatives that will be acceptable to guests.

References
Key words
Cape Town Central Business District (CBD), restaurant, staff turnover, high staff turnover, low staff turnover, staff retention, hospitality sub-sector

Introduction
Hospitality is usually defined as a business which offers tourists facilities such as food, accommodation or travel (Tiwari, 2015). Over the past half century, hospitality has become a very lucrative industry, with research approximating it as a multi-billion dollar industry (Bottorff, 2013). Employee retention has been particularly a challenge in the hospitality industry as this has been illustrated by multiple studies which have had consistent reports of high employee turnover in the industry (research conducted by Davidson & Wang, 2011; Mohsin, Lengler and Kumar, 2013; Pearlman & Schaffer, 2013). According to Mbane and Ezeuduji (2014), there has been various international studies which focused on hospitality employee retention and turnover, however, this data has largely been obtained in Europe and North America, and the literature lacks African, particularly sub-Saharan Africa data.

Methodology
Descriptive research design was used for this study as it is descriptive in nature. Descriptive research designs help provide answers to the questions of who, what, when, where, and how associated with a particular research problem (Shuttleworth, 2008). The study used quantitative research approach. Two closed and open-ended questionnaires were used for data collection where, one for chefs and one for the kitchen managers. Chef’s questionnaire included three sections, namely, section A, which was Biographical data, section B which was the factors of staff turnover and lastly section C which was the impact of staff turnover. Executive chefs or managers’ questionnaire aimed to cover the status of staff turnover and the second questionnaire for non-executive chefs will be available to answer the causes and impact of staff turnover. A total number of 55 restaurant managers and 120 non-executive chefs answered the questionnaires of the study within 110 restaurants in Cape Town CBD. The data will be analysed using SPSS 26 and will be presented in graphs, pie charts as well as tables to openly see the results.

Results
Kitchen managers’ questionnaire consisted of two sections, namely, section A which was Biographical data and section B which was assessing the staff turnover holistically. The chefs’ results indicated that the majority (57.5%) of the demographics were male participants with most (47.5%) falling under the 20-29 age group. The results proved that most (47.5%) of the participants also had no matric for qualifications. Factors which proved to be the cause of staff turnover was working hours (60%) which were indicated to be more than the hours set...
by basic condition of employments act BCEA. Another factor which stood out at 52.5% was that they strongly agree they are under paid. Even though the participants were not happy with their current organisation, most (40%) of them said they wouldn’t change the industry but rather change to a different organisation that’s better. This focuses on the impact of staff turnover proved that when a staff member leaves there is a significant gap they leave especially if this constantly happens which the case in the industry is. It was agreed by 90% of the participants that staff quitting affects guest service and that it costs the company more money because new staff have to be trained. Kitchen managers’ results, it was clear that the staff turnover does highly affect the restaurant industry because the company uses money to retrain new staff. This was proven as majority of the participants agreed that 6 months does not pass by without having team members quitting. The participants had similar answers to what they think was the cause of staff quitting, this included staff being lazy, discouraged easily, and cannot follow through instructions.

Conclusions and Recommendations

The researcher has picked up a norm while collecting data and analysing the data, whereby majority of the restaurant owners do not pay or under pays for overtime so I would recommend relooking at the budget to pay for overtime. This would decrease the staff turnover as most staff complaint about this. Secondly look at getting more staff so that you have 2 different shifts instead of one long shift if you operate for more than 12 hours. The researcher also believes the restaurant industry needs to allocate more money towards educating its staff to enhance their skills which will in-turn bring better service to its guests. Apart from enhancing guest service, this will be of benefit to the restaurant industry could decrease the high staff turnover and maintain staff retention which would in turn increase profitability.

References

1988 Hospitality subsector employment profile: A case of restaurants based in multiple cities in South Africa

Dr T. Nyathela, Ms M. Silo & Prof I. Bob, Cape Peninsula University of Technology
tnyathel@yahoo.com

Key words
Employment profile, hospitality subsector, restaurants

Introduction
Tourism is an important contributor to the South African economy and is recognised as having a positive impact on the gross domestic product (GDP) and job opportunities (WTTC, 2018). Hospitality is the fastest growing sector with the majority of the employment (Taal, 2012). Therefore, the study was conducted to provide information about the employment profile in South African restaurants.

Methodology
In order to gather information, a Quantitative approach was applied for this study. Cities in various South African provinces were selected using multi-stage sampling. Whereby, the top three (Cape Town, Johannesburg and Durban) and the bottom three (Kimberley, Polokwane, and Pietermaritzburg) most visited cities in South Africa of the Top 10 most visited cities in the country were included in the study.

Employees and managers from various restaurants participated in the study. Convenience sampling was used to select the 402 restaurants within the chosen cities, as well as the managers and employees in the different restaurant types (family, casual, fast-food/quick service and upscale/fine dining).

Results
Among the employees surveyed, more permanent than temporary/casual staff were employed. The average for permanent staff was 16 whereas the average for temporary/casual staff was 12, indicating that, on average, most staff among restaurants Surveyed were employed on a permanent rather than a temporary/casual basis. Most restaurants employed between 10-19 persons on a permanent basis followed by 5-9 persons and 20-49 persons. In relation to temporary/casual employees, most restaurants employed less than 5 persons followed by 5-9 persons, 20-29 persons and 10-19 persons.

In terms of the gender of the employees, on average, restaurants employed more females than males. Regarding population groups, it is worth noting that Africans are employed the most in many restaurants. Concerning where respondents originate from, permanent employees were locals mostly. In terms of specific positions within the restaurant for permanent employees, the highest average was for waitrons and cooks. While transformation in overall numbers is evident, equity target groups tend to occupy lower-paying positions.
Nearly half of the restaurant employees are in the 26-33 years’ age group, followed by the 18-25 years and the 34-40 years’ age groups, respectively. The average age among the employees interviewed as 28.7 years suggesting that relatively younger adults are attracted to work in the restaurant sector. The majority of the respondents were from South Africa, followed by respondents from other African countries which included respondents from Zimbabwe, Malawi and DR Congo. Regarding the highest level of education, the majority of the respondents indicated Matric followed by a Certificate or Diploma. The study revealed a broad range of qualifications that do not traditionally fit into the sector. Among the rest, the most prominent were diplomas and certificates in hospitality/ catering/ hotel management, cooking/ food, retail/ business, marketing, management, human resources, and tourism. Additionally, it can be seen that the majority of the qualifications obtained by the employees do not have much significance to the job they have in the restaurant. For the few respondents who perceived their qualification as exposing them to career options in the sector, a broad array of skills and areas were identified, ranging from knowledge and professional skills, new careers and promotions, relevance or requirement for job industry, business and management skills, social skills and employment. The position held by the respondents in the restaurants were varying and covered both back-of-house and front-of-house positions, with the majority of the respondents being waitrons and cooks.

Conclusions and Recommendations

According to the results, more permanent employees are employed than temporary indicating that there is more stable employment in the restaurant sector. Out of these employees’ majority of them were occupying lower-paying positions. Furthermore, they were the age of below 35 years with various qualifications.

In order for the restaurant sub-sector of the hospitality industry to make an even greater contribution to employment in South Africa by assisting with the transitioning of equity targets in lower level positions, intervention such as managerial or supervisory development programmes is recommended.

With the majority of the qualifications obtained by the employees do not have much of a significance to the job they have in the restaurant and graduates who are qualifying with hospitality qualifications, mechanisms will need to explored so that hospitality schools, government, and the restaurant industry work together to create the necessary career pathways (which will also address recruitment) for these graduates.

References

Key words
Star grading, quality management, accommodation sector, guest houses, guest house managers, perceptions, TGCSA, NAA-SA, GHASA

Introduction
The South African Department of Tourism recognises that local tourism has potential to boost the economy by eliminating unemployment and increasing business opportunities. The tourism industry comprises five major sectors, namely hospitality/accommodations, food and beverage facilities, leisure and entertainment, transportation and travel services (Revfine, 2019).

The guest house accommodation sector configures a significant portion of the hospitality sector within the South African tourism industry (Van Huyssteen, Strydom & Rudansky-Kloppers, 2015:313). Tourism Grading Council of South Africa (2019) refers to a guest house as accommodation provided in a house that has gone under renovations or a house specially designed for providing overnight accommodation and breakfast to guests, visitors and travellers. Specialised accommodation such as guest houses present an alternative option to regular hotels (Wang, Hung & Li, 2018:24).

According to Tefera and Govender (2015:1-17), the primary item that guests consider before booking for accommodation is its rating. Rhee and Yang (2015: 676-587) state that the terms “hotel rating”, “hotel grading”, “hotel classification” and “hotel segmentation” are usually utilised interchangeably to distinguish hotels for their price, service and facility levels. TGCSA is the only official ranking system recognised in South Africa. TGCSA assesses the quality of accommodation and awards stars, certificates and plaques to qualifying establishments (TGCSA, 2019).

Methodology
In order to investigate guest house managers’ perceptions regarding quality management and grading system by TGCSA in the City of Tshwane, the researcher adopted a quantitative research approach that utilises a systematic procedure and makes use of numerical data in an objective approach (Bassadien, 2017:71). In this study, the researcher utilised a descriptive design. The study area for this study was the City of Tshwane. The sample for the study consists of all guest house establishments in the City of Tshwane which are listed on SafariNow. The researcher invited 188 guest houses to take part in the study, however, only 102 guest houses responded. This study used a structured questionnaire to collect data from guest house managers, owners and supervisors. The researcher analysed the collected data using Statistical Package for Social Sciences (SPSS) 25.
Results
The collected data revealed that the bulk of the respondents (60.8%) were females, while the remaining (39.2%) of the respondents were males. The majority of the respondents were between the ages of 36 and 45, while the lowest age group was age 56 and above. The data also revealed that 52% of the guest house managers were familiar with the star grading system even though only 15% were trained on the aspects of grading. The results also showed a correlation between graded establishments and the benefits of star grading to the guest house industry. The results further revealed that guest house managers were more familiar with the words “quality management” than “grading”. A significant number of guest house managers knew and understood quality management better than they knew and understood the TGCSA’s star grading.

Conclusions and Recommendations
Future research should investigate different methods and techniques that can be introduced to the guest house industry with the aim of training and equipping owners and managers. Once owners and managers are trained and equipped it becomes easier to filter the knowledge down to the rest of the employees. Since the research results revealed that guest house employees lack knowledge in quality management and grading; future studies can also focus on developing a model or manual that can be used as a tool to educate guest house employees on issues that affect the hospitality industry such as grading, quality management, benchmarking and customer service.

References
Food consumption patterns of first year students at a higher education institutions residences

Ms S.S. Macozoma, Cape Peninsula University of Technology
macozomasibusiso@wsu.ac.za

Key words
Food consumption, eating patterns, food, undergraduate students, higher educational institutions, higher educational residences

Introduction
People’s dietary habits have been central to their lifestyles, health and mortality (Mikolajczyk, El Ansari, & Maxwell, 2009:31). This has ingrained the dependence of human beings on food and nutrition for survival on the choices they make in terms of the type of food they consume. The transition of young people from a home that provides a healthy balanced meal to a change in consumption patterns will impact student’s lifestyle. Changes in consumption patterns, defined by Ogunniyi et al. (2012: 32) influenced by certain factors like availability of food, accessibility of food and economic status. Students becoming independent also means being able to provide healthy and nutritious food which at times is not possible due to time constrain accessibility of fast foods and non-existence equipment like stoves and pots in preparing one’s meal. In addition, inflexible lecturer time table that provides limited breaks for food intake, dietary patterns of students are often altered to suit the weekly lecturer time tables. The aim of the study is to establish the eating pattern of first year students living in two higher education residences in Cape Town, so as to recommend basic healthy eating habits that will sustain these students during their study period. This gives credence to the study’s aim to investigate food consumption patterns to the effect of the movement of first year students to a residence facility of a higher learning institution.

Methodology
This study was undertaken using a quantitative research approach by means of a questionnaire to solicit data from 150 first year students from residence facilities of the Cape Peninsula University of Technology and College of Cape Town. School accommodations and residences for first year students who are from home and coming to live independently for the first time, in particular around the Western Cape CBD, situated with a 2km radius in related to one another. This was done using a snowball data collection technique because of the researcher’s unfamiliarity with the population landscape. This data was then analysed using the Statistical Package for Social Sciences (SPSS) version 25. Preliminary data clearly shows that first year students were influenced by a number of factors, causing drastic changes in their daily healthy food consumption patterns. Inability to sustain a healthy lifestyle on students can have a far reaching consequences on their lives and their quest for educational attainment and development.
Results

The preliminary results are being presented for this conference as I am still busy with data collection. Fifty (50) questionnaires have been completed thus far. The questionnaire was divided into three sections, namely, socio-demographics, availability, access and frequency of food consumption and food diversity. The purpose of the socio-demographics was to determine the profiles of the first year students living in residences. This will assist in breaking down the overall response data into meaningful groups of respondents. So far, the study shows that 50% of the respondents consume food that is accessible and affordable. The study shows the majority (93%) of the participants have no time to cook or prepare for healthy snacks. This inhibits consumption of unhealthy food patterns, leading to obesity, sickness and lack of concentration in class. The 7% of first year students are cautious of what they are eating and take into consideration what healthy eating habits consist of. Further the results indicated that students tend to eat the same thing constantly with no interest to the food groups that are not familiar to them. The study was not completed at the time of the abstract submission.

Conclusions and Recommendations

The study reveals inconsistent pattern of food consumption due to a number of factors like affordability, lack of facilities at residences, study time table constraint and knowledge of food and changes in life style.

The study encourages maintenance of healthy dietary habits. In an attempt for sustainability of a healthy life style specifically for students, it is important to look at factors that may hinder first year students in obtaining maximum nutrition while living at school residences. This will also assist institutions of higher learning to contribute to the existing body of knowledge in relation to food consumption patterns of first year students.

References

7. SUSTAINABILITY AND GLOBALIZATION

1906 Determinants’ web for users’ responsiveness to technology adoption and usage continuance: Implication for eclectic resource utilization and sustainable development

Dr G.A. Oye, Dr S.A. Adesoji & Dr I.J. Diyaolu, Obafemi Awolowo University

gbengaoye22@gmail.com

Key words
Determinants’ web, users’ responsiveness, technology adoption, eclectic resource utilization, development

Introduction
Irrespective of the current level of technological advancement in any nation, the technological trends in every nation have always evolved from using their locally available resources for their very traditional technologies through various transitional stages, to their present level of technological modernity which is presently being embraced to meet various needs of man. While every constructive technology is designed to solve particular problems, the rate of adoption, level of utilization and the continuity of utilization are all influenced by a web of factors. Over the years, the relative advantage, compatibility, complexity, trialability, and observability of a new technology had been the major features or factors which were documented as influencing the level and rate of users’ responsiveness to adopting new technologies (Ekong, 2010). However, a myopic and short term analyses of the above listed factors which were noted as influencing the adoption and usage of selected technology have overtime resulted in many unintended negative consequences which are very obvious on our local ecosystem - man and his environment.

Methodology
Purposively, the technologies considered for this review were the green revolution technologies in agriculture, the drink carbonation, grain polishing, food preservation and packaging technologies in the food processing industry, drugs synthesis in medicine as well as the wireless telecommunication technology. The selected technologies which were reviewed viz-a-viz their adoptions, period of utilization, utilization experiences and the present consequences on local resource utilization, rural livelihoods, human health and the environment. Larmorck’s theory of ‘use and disuse’ was adapted to discussing the necessity for eclectic utilization of the traditional and modern technologies.

Results
In agriculture, the green revolution technology that advocated the use agrochemicals (fertilizers and herbicides) was adopted as it practically made work easier for farmers but without a significantly sustained better level of living for the farmers over the years (Kwa,
2001; Oye, 2018). Also, while aiming to improve the organoleptic features of food items via improved grain polishing, food preservation and packaging technologies, Haas (2006) reported a significant compromise in the nutritional and health value of most food items. Users of synthetic/prescription drugs noted a seemingly spontaneous effectiveness on specific conditions but with negative side effects such as nausea, loss of appetite, body and sexual weakness, weight gain and constipation among others being reported among them (Oye, 2014). The introduction of wireless telecommunication technology made communication much easier and cheaper but with negative health and environment impacts from dangerous radiation waves. Presently, production and consumption of organic foods and zero additives, use of natural/organic medicines and minimum exposure to radiations are being advocated to health seekers in most countries (Kwa, 2001; Marten, 2001). All these natural and health friendly resources and technological practices were the native features of traditional technologies which were traded off with the adoption of the modern alternatives. In this study, it was however noted that both the traditional and modern technologies had strength and weaknesses which are more obvious in this 21st century.

The study discussed twenty (20) key dimensions for holistic consideration to moderating users’ responsiveness to technology adoption and utilization. These include: (i) effectiveness, which describes the ability of the technology to get the desired results per time (ii) efficiency, which describes the cost of achieving a desired result (iii) complexity (iv) adaptability (v) appropriateness (vi) human or users’ health (vii) environmental friendliness (vii) manpower demand and (viii) transferability (ix) availability (x) affordability (xi) accessibility (xii) flexibility (xiii) repeatability (xiv) spontaneity of technology effectiveness; (xv) user involvement in technology development (xvi) compatibility of technology with culture, (xvii) safety of the technology operators, (xviii) ease of tools and machinery repair maintenance, (xix) traceability of product to process technology, and (xx) affinity of technology users for social interaction or interdependency.

Conclusions and Recommendations

The study concludes that neither the traditional nor the modern technologies are absolutely better than the other when assessed with the twenty dimensions to users’ responsiveness. Thus, development and utilisation of an eclectic approach that carefully integrates the strengths of both the traditional and modern technologies was recommended. This may foster sustainable development and better livelihoods as it puts competitive relevance on both the modern and indigenous knowledge systems.

References

Introduction

Sustainability in reference to environmental development literacy is the knowledge and mindset that compel an individual to become deeply committed to building a sustainable future and that allow him or her to make informed and effective decisions to this end (Forum for the Future, 2004). This resonates with the teaching of sustainable development and unambiguously intends to nurture the ability of students in any discipline to take effective and appropriate action in promoting human welfare (Diamond & Irwin, 2013). A commitment to taking action is important and “changes in values, attitudes and behaviours” are expected as outcomes of effective education for sustainability (Warburton, 2003:50).

According to life cycle assessments carried out to determine the environmental damage caused by the different stages of clothing’s life cycle, the textile use stage is the most harmful to the environment (Allwood et al., 2006; Chen & Burns, 2006). Life cycle assessments showed that the use phase has the highest energy use and is viewed as the most polluting stage of a garment’s life cycle (Laitala & Boks, 2012). Chen and Burns (2006) observed that the use and maintenance stage of a garment’s life cycle is the most forgotten stage by clothing manufacturers/designers and consumers when it comes to addressing the environmental impacts of the clothing industry. A disconnect between the seller and the buyer emerges immediately after the garment is bought. Most clothing companies let go of their concern of their clothing and leave the responsibility of the use and disposal stage fully up to the consumer. Most researches carried out have focused on environmental effects of textile production stages, consumers’ knowledge of environmental concerns related to the manufacturing and whether the knowledge translates into sustainable buying and disposal practices. Limited studies in South Africa by the year 2014 had looked at how sustainability literacy affects consumers’ sustainable usage and general maintenance of garments.

The overall aim of the research study was to establish the sustainability literacy of students and staff members of the Faculty of the Arts at Tshwane University of Technology, South Africa and to determine whether their literacy (knowledge) influenced positively on their day-to-day clothing maintenance (washing, drying, ironing and mending) practices.

The aims of the study were:

- To establish the level of sustainability awareness among the students and staff members at the Arts Campus of TUT in relation to clothing maintenance.
- To describe current clothing maintenance practices of the students and staff members of the TUT Faculty of the Arts.
Hypotheses formulated were:

i) Students’ and staff members’ sustainability literacy is significantly associated with their garment selection.

ii) Students’ and staff members’ sustainability literacy is significantly associated with the frequency of purchase and use of technology (washing, drying and ironing).

iii) Students’ and staff members’ sustainability literacy is significantly associated with the frequency of washing, use of washing detergents and use of fabric softeners.

Students’ and staff members’ sustainability literacy is significantly associated with the methods of mending of garments.

Methodology

This study utilised quantitative research methods. Data were collected from students and staff members of the TUT Faculty of the Arts.

The estimated population was 1962, which comprised 1702 students and 260 staff members. If 42% of the student population were assumed to be “readily available” and 35% to be the worst acceptable margin with 99.9% confidence level, then a minimum of 248 participants was needed. To be precise, 10% of the student population was 170 students and 30% of staff population was 78 staff members. Since the staff population was not too large, 30% were targeted to provide representative data. Gay and Airasian (2003:113) mentioned that a small representative percentage (30%) of the population is acceptable for the purpose of statistical procedures. Of the expected 248 participants, only 214 took part in the research.

Systematic random sampling was applied in the selection of both the students and staff members. A list of registered students in the six departments of the Faculty of the Arts was used for the selection. Data were collected using a semi-structured questionnaire. Data analysis was done using descriptive statistics as well as Pearson’s chi-square and Fishers exact tests. Inferences were made and the interpretation was performed at 95% confidence limit, implying that levels of significance were tested at the 5% level. Care was taken to ensure that results were reliable and valid. All ethical considerations were observed.

Results

The results are presented according to the aims of the study

- Level of sustainability awareness among the students and staff members at the Arts Campus of TUT in relation to clothing maintenance

The findings showed that the majority (71%) of the participants understand what eco-fashion means. However, their knowledge does not necessarily translate into sustainable behaviour with regards to selecting washing machines, irons, soaps, detergents and fabric softeners. The findings further highlighted that the majority of the participants do not understand the environmental implications of different soaps, detergent and excess water use on the environment. Frequent washing means frequent release of chemicals and detergents, leading to water pollution. Regarding dry cleaning, most (63.4%) participants understand that chemicals emitted by dry-cleaning facilities generally have negative environmental impacts.

Many participants (54.2%) understand that mending garments leads to extended use of that item. Mending prevents frequent disposal of clothing, which ultimately encourages increasing...
garment production and which has detrimental effects on the environment throughout the textile and apparel supply chain. The hypothesis related to this concept is that students’ and staff members’ sustainability literacy is significantly associated with the washing of clothes. This hypothesis was rejected, however, because there was no significant relationship between knowledge, washing behaviour, garment mending, choice of washing detergents, soaps and fabric softeners in relation to the environment (p>0.05).

- Current clothing maintenance practices of the students and staff members of the TUT Faculty of the Arts.

The majority of the participants usually check the recommended washing temperature indicated on the label, while a smaller number check the drying instructions. The participants’ responses indicated that no seriousness is attached to the type of fabric, care instructions, ironing instructions and mending of the garment, which, if observed by all consumers, could lead to a healthier environment. About 60.7% of the participants buy clothing once in three months or less, a sign of excessive clothing purchasing, which ultimately leads to environmental damage as increasing garment production is encouraged.

Regarding hand washing, a majority of the participants reported that they do hand washing once a week or after longer periods, depending on the usage demand and dirtiness of the clothes. The hand-washing approach is a sustainable act, since energy is saved while promoting physical exercise, which, in turn, promotes healthy living. On the issue of dry-cleaning, about 25,2% of the participants reported that they take their clothes to a dry-cleaning facility monthly. They mentioned that they have tailored and delicate garments that they wear sparingly and need to be dry clean once in a every 3-4 months.

Conclusions and Recommendations

The students and some lecturers have minimal knowledge on how clothing maintenance and care affects the environment. They also do not understand the connection between eco-technology and sustainable behaviour. Sustainability literacy should be a holistic approach where the consumers understand how selection of garment/fabric affects water, detergent usage as well as washing machines and dryers. The findings calls for enhanced training of consumers on how choice of technology, detergents, garments and the approach of washing play a major role in protecting the environment.

References


1937 Demystifying the knowledge: Integrating IKS and modern science for local weather prediction

Ms N. Ubisi, Prof U. Kolanisi & Prof O. Jiri, University of Kwa-Zulu Natal
nomceboubisi@gmail.com

Key words
Food security, integration, indigenous knowledge systems, modern science, smallholder farmers

Introduction
Improving food security for rural smallholder farmers needs suitable risk management strategies related to climate. Such as appropriate climate information to assist smallholder farmers decision-making at a local level. South African government have made progress in providing services that are climate related, however, there are still major gaps with reference to specific weather forecasts at a local level, as well as producing reliable, user friendly and timely information. Therefore, this study aims at identifying and documenting existing indigenous knowledge in weather forecasting in Nkomazi local municipality and as well as promoting the integration of indigenous knowledge and modern science weather forecasting for improved smallholder agricultural production.

Methodology
Data was collected from 100 interviews, 8 key informant interviews and 8 focus group discussions in Nkomazi Local Municipality. Analysis of data was done using SPSS version 25 and Microsoft Excel. The study applied both quantitative and qualitative methods. Quantitative was applied to compare all participants’ responses as they were asked identical questions in the same order to allow for significant comparison of responses across participants. Rainfall and temperature data was requested from the South African Weather Services (SWS) to be used in combination with data collected through surveys, key informant interviews and focus group discussions. Qualitative data was analysed through thematic analysis.

Results
In Nkomazi Local Municipality, women dominated the farming sector (63 %). Findings from the focus group discussions revealed that a high number of smallholder farmers in Nkomazi relied on their indigenous knowledge (IK) for weather prediction through observing animal behaviour, plants, and atmospheric as well as human ailments. Results from key informants also highlighted those farmers employ measures such intercropping and diversification techniques, seed selection and mixed methods to avoid the risks of drought and climate change. Of all the respondents, 93% of the farmers had some knowledge of IKS. With 78% found IKS more reliable than scientific forecasts. The results from trend analysis of the annual rainfall and temperature data for Nkomazi local municipality from 1993 to 2018 highlighted the different years with highest (2013, 340) and lowest (1993, 130) minimum temperatures as well as rainfall variability (lowest 2000 & 2010, 40mm/year and highest being 2013,
700mm/year). However, during the focus group discussions farmers revealed that they still preferred their IKS as compared to scientific forecast, due to lack understanding and lack of area specification as weather forecast is provided at a district level.

Conclusions and Recommendations

Some of the great challenges facing the world today is the lack of IK documentation losing IK climate indicators due to climate change and variability. Indigenous knowledge is mainly disseminated orally from generation to generation with no reference point, creating inter-generational gap between its custodians, which are mainly elderly people, and the upcoming generation. To improve sustainability, efficient documentation of indigenous knowledge and creation of a framework for integrating the two knowledge systems in weather forecasting is needed. Importantly there is a great need to create an information dissemination network for weather forecasting within local municipalities. In order to achieve food security among rural smallholder farmers both knowledge systems should be integrated for farmers to make informed decisions.

References

1949 Perceptions or views regarding possible commercial cultivation of baobab tree by households in the south-east lowveld of Zimbabwe

Ms B. Mugangavari, Prof K. Mbatha & Dr M. Masekoameng, Unisa
mugangab@gmail.com

Key words
Indigenous trees, fruit pulp, sustainability, food security, rural community

Introduction

Indigenous fruit trees provide a major contribution to rural household food security in communities of the south-east lowveld of Zimbabwe. Household livelihood in this arid area depends on rain-fed agriculture commonly characterised with crop failures resulting in a 71% household poverty prevalence (UNICEF 2017; Chikodzi et al, 2013). During periods of food shortages, households rely on indigenous fruits growing within the communities (Cordeiro, 2013). Baobab trees (Adansonia digitata) are among the indigenous fruit trees found in the study area whose products are harvested by households as a coping mechanism during periods of frequent droughts (Romero et al, 2001: Mutambara, 2014). With the poor regeneration of the baobab population in the southern African region, its commercial cultivation has been cited as one of the method of maintaining sustainability (Venter and Witkowski, 2013; Sanchez et al, 2011). With the acceptance of the baobab fruit pulp as a food ingredient by the United States of America and the European Union, household vulnerability to poverty will be reduced in the south-east lowveld of Zimbabwe (Charade et al, 2009). The
study endeavours to reveal perceptions of households regarding the possibility of commercial cultivation of the baobab tree by households in the south-east lowveld of Zimbabwe.

Methodology
The study was carried out from June 2016 to December 2018, in two rural communities of Wengezi and Gudyanga. These communities are located in the Chimanimani district of Manicaland province, south-east of Zimbabwe. Baobab trees are indigenous to the area scattered in forests and around homesteads (Venter and Witkowski, 2013). A cross-sectional research study was conducted after an ethical clearance from the University of South Africa. A mixed method approach was employed in data collection and analysis (Saunders et al, 2016; Creswell, 2014). This entails that both quantitative and qualitative data collection and analysis methods were used in the same study so as to address the issues around the subject possible commercial cultivation of baobab trees (Cordeiro, 2013; Saunders et al, 2016). Questionnaires and semi-structured interviews were the tools for data gathering used after a pilot study to give validity of research instruments (Creswell, 2014). All the 68 households of the study area were issued with questionnaires. Four households, purposively selected, were interviewed face-to-face on voluntary basis so as to capture the views which were to be reported qualitatively (Saunders et al, 2016). An interview guide with open-ended questions based on the research objectives was used. Household heads and adults were targeted in the issuing of questionnaires and interviews so as to obtain concerned views (Saunders et al, 2016). In the absence of such person in a household, the most influential or informed male or female with the age of 20 years or above, participated (Creswell, 2014). Persons below 20 years of age, mentally-challenged or ill were excluded from the study (Creswell, 2014; Maree, 2013). Quantitative data was analysed using descriptive statistics while qualitative data was analysed using Microsoft Excel Spreadsheet and Microsoft Word (Maree, 2013).

Results
Out of the 51 households who responded, 41 of them supported the idea of commercial cultivation of the baobab tree in the study area. The respondents supported the idea in anticipation of creation of employment for members of the community and an increased income generation from sale of baobab products. Two households did not support the idea while five were not sure. The time taken to reach maturity and the frequent droughts being experienced in the study area, were put forward by respondents as the some of the reasons they were not supporting baobab cultivation.

Conclusions and Recommendations
An overwhelming 80% of the households (41 households) supported the idea of commercial cultivation of the baobab tree in the study area. The socio-economic values of the baobab tree products were the main factors cited for its possible cultivation. Households which supported the idea of baobab tree commercial cultivation in anticipation of employment creation and increased household income for the study area. Previous studies on domestication of the baobab tree in West and Central Africa have been done using the participatory method and have proved to be a success (Meinhold et al, 2016). Further studies can be carried out on the selection of baobab trees for propagation and field management required thereof. Communities of the study area should be made aware of the possibility of
earning foreign currency from baobab fruit pulp exports so that they can make informed decisions.

References

1955 Mycotoxins on Bambara groundnut in Mpumalanga, South Africa

Dr M. Otto, Prof H.C. Schönfeldt & Dr B. Pretorius, University of Pretoria
Margot.27.muller@gmail.com

Key words
Mycotoxins, Bambara groundnut, South Africa

Introduction
Bambara groundnut is an underutilized, indigenous crop in South Africa. It is ranked as the third most important African leguminous crop, after groundnut (Arachis hypogen) and cowpea (Vigna unguiculata) (Mubaiwa et al. 2017). Foods can pose significant safety risks
(Vojkovská et al. 2017). For example, bambara groundnut can become contaminated by pathogens and secondary toxic metabolites such as mycotoxins which are produced by fungi (Olagunju et al. 2018a). South Africa, with its subtropical or tropical climate characterized by hot and humid conditions, erratic rainfall and periods of drought makes it ideal for the proliferation of toxigenic fungi (Darwish et al. 2014; Mboya & Kholanisi, 2014; Matumba et al. 2014). In addition, storage facilities often lack pest control and have poor aeration, moisture and temperature control which promotes the development of mycotoxin producing fungi. Some African governments have implemented regulations to control mycotoxins, especially AF contamination (Shephard, 2003). These regulations, however, are mostly not implemented and actively controlled in rural areas where food is not produced for national food supplies but for own consumption (Shephard, 2003). A recent study conducted by Nleya et al. (2018) found bambara groundnut obtained from the Makoni district of Zimbabwe to be contaminated with all four major aflatoxins. The aim of this study was to characterize mycotoxin producing fungi on freshly harvested bambara seeds from rural farmers in Mpumalanga.

**Methodology**

Freshly harvested bambara groundnuts were collected from 15 farms in Mpumalanga. A hundred seeds from each respective farm were plated onto Potato Dextrose Agar (PDA) and incubated at 25°C for 2-3 days after which they were examined for fungal growth. These fungi were then examined microscopically for genus determination. Selected fungi belonging to the genera Fusarium, Aspergillus and Penicillium (fungi belonging to these genera are known to produce mycotoxins) were further characterized molecularly to species level by means of gene sequencing for polyphasic identification.

**Results**

A total of 76 fungal isolates were obtained from the freshly harvested bambara seed belonging to the genera Aspergillus (9%), Penicillium (29%), Trichoderma (28%), Rhizopus (7%), Epicoccum (17%) and Mucor (7%). Further molecular characterization of the fungi belonging to the potentially mycotoxin producing genera Apsergillus and Penicillium identified the isolates as Aspergillus flavus and Penicillium citrinum, Penicillium oxalium and Penicillium citreoviridin, all of which are known mycotoxin producing species.

**Conclusions and Recommendations**

This study has shown the prevalence of mycotoxin producing fungi on freshly harvested bambara groundnut in Mpumalanga which raise concerns on consumer health. The findings of this research should be communicated to rural bambara groundnut farmers to create awareness of the current situation. Good manufacturing practices (GMP) and Hazard Analyses and Critical Control Point (HACCP) practises could potentially be implemented to minimize the prevalence of the presence of these fungi on the seed which would lead to improved health implications.

**References**


1963 Sustainability and its various approaches within the department of clothing and textiles – Student’s perspective and approach

Dr S. Patnaik, Cape Peninsula University of Technology
patnaiks@cput.ac.za

Key words
Sustainability, cutting, marketing, textile testing

Introduction
With the ongoing revolution on sustainability where every country is cashing in on implementing it within their limit and availability of resources and hence coming up with an outcome is not necessarily what we call “sustainability”. Yet, this global terminology has been going on for decades and only now are we really waking up to implement and include it as part of our curriculum and part of teaching and learning. Therefore as an adoption to this ‘save the planet’ approach, Cape Peninsula University of Technology (CPUT)’s clothing and textile department came up with preaching and teaching the students to adopt to this concept and work on a project showcasing examples of sustainability via use of left out fabrics, off-cuts and left over trims and accessories by the end of the year.

Methodology
The approach to this will be addressed in the form of an integrated project involving the amalgamation of cutting, textile testing, managing and marketing post creating the product. The idea is to create a mini artefact/sample out of the leftovers from the previous years. The raw materials for creating the sample is leftovers from the garment created as part of student practicals in the department which will be in the form of off cuts of various types and blends, any form of leftover trims and accessories in the course of the year. They have to carry out various textile testing like tensile strength, area weight, colour fastness, etc. The students will be given an opportunity to express themselves by critically thinking about the project
(Rhodes, 2010; Heinrich et al., 2015) and the final outcome in the form of artefacts/samples. They have a choice of working individually or in pairs if they feel they need support of a peer as it’s an integration of a number of subjects.

Results
The project will only run in the last term of the year and will be part of their year-end assessment. The brief is depicted in Figure 1. The expectation is to reflect on their understanding, discovering alternate and sustainable (Wals and Jickling, 2002) ways of creating a product and its relevance to the current scenario i.e. reduce, reuse and recycle. The outcome of the project needs to be relevant and fulfilling the criteria of reduce, reuse and recycle, in terms of the final sample. The students are expected to provide evidence in the form of various textile testing carried out on the raw materials and the results obtained. Part of the result here is in the form of their creative and critical thinking skills, which will reflect on their completed project which will be peer reviewed, self-assessed and finally presented to the subject lecturers via an oral presentation and an artefacts. By carrying out this subject the student will experience sustainability methods in a real setting creating a larger exposure to network with their peers within the class. It will also make students more environmentally conscious and this might go further as part of community projects and look for improvements and developments that can be implemented.

Conclusions and Recommendations
A sustainable outcome that will not only let the students learn, critically think and be creative yet be a lifelong follower and preacher of sustainability. The approach will also teach the students to see clothes in a different aspect and not just merely buying, wearing and disposing off yet a lot that could be recreated out of it. Successful projects will be part of the
departmental market day and they will have a chance to receive awards in the form of certificate and cash. The project is a practical learning to contribute to the industry where the students got exposed to waste management and creation of sustainable outcomes which they can implement it at the world of work either in the form of hands on experience or in the form of idea generation. The project was in its first year yet the outcomes are creative which reflects their understanding of practical knowledge and being innovative. This can also be seen as a collaboration with other institutions with similar or related fields as it will be co-creation and service learning both happening together.

References

1971 Effects of cloth diapers on babies and the environment

Ms P. Chitura & Dr B. Mantyi-Ncube, University of Botswana

patiencechitura@gmail.com

Key words
Sustainability, eco-friendly, disposable, re-usable

Introduction
Mothers are always alert when it comes to their babies’ welfare, considering sustainability, eco-friendly, safety and health becomes of paramount importance. Multiple responsibilities for most young mothers including laundering nappies become a major concern. Evolution of cloth nappies to diapers has given most mothers easy life despite negative effects from disposable diapers. Disposable diapers made using chemicals may cause skin problems to the babies and getting rid of disposable diapers causes land pollution and filling of landfills. Product development is usually a response to an existing problem in a product, or it is identifying users’ needs in order to increase the standard of people’s living conditions (Zwane, 2010). Disposable products are available at relatively high price and not easily available for financially marginalised people. Development of an affordable, re-usable pocketed cloth diaper for babies is a mandate for this project design. Many have found organic clothing to be helpful in reducing exposure to the vast amount of toxic chemicals that consumers are unknowingly exposed to daily, therefore, the purpose of this project design is to find solutions for the arising issues caused by disposable diapers on the environment and on babies’ health (Groove et al., 2002).
Methodology

The Conceptual Design method developed by Pahl and Beitz is a 'Systematic Approach' cited in (Gurcum, 2017), generally seen as a prescriptive model of designing based on observations of professional design practice. Hence, the designer adopted systematic framework to provide a more effective and efficient design process. Observational drawing and sketching as external representations of internal concepts were carried out with/using CAD design software TUKA CAD and AutoCAD (Al-Mousa, 2013). The study also included a qualitative paradigm and data was collected from primary sources regarding re-usable cloth diapers. The sample included twenty mothers from two different educational institutions in Bulawayo province.

Results

An affordable, re-usable pocketed cloth diaper for babies was made using cotton cloth which is a highly absorbent fabric for the inner insert of the pocketed cloth diaper and a soft bamboo warm fabric for the outer pocketed cloth diaper. The PUL cotton laminated fabric was used as the water-resistant: fabric that resist the penetration of water to some degree but not entirely making the baby and the caregiver comfortable. The inner layer was made of a lighter cotton material which quickly passes moisture to the insert leaving the baby dry and comfortable just like the disposable diaper performs. The diaper has inserts, which gives the pocketed cloth diaper an easy-care property. The selected fabrics were tested for water resistance, flammability and water absorbency, prior to designing and evaluating the product. The water-resistant fabric resists the penetration of water to some extent but not entirely, cotton fabric absorbent and the bamboo fabric were inflammable due to a finish applied to it. The prototype was evaluated by user trials and received approval by individuals with young babies hence is recommended for public use.

Conclusions and Recommendations

The re-usable diaper offers a potential alternative to consumers especially financially stressed individuals, while at the same time providing an eco-friendly option. The concept of using re-usable products should be incorporated in the recycling programmes for a start and it is vital to educate people on the benefits of re-usable products.

High technology field has consistently shown innovation in the production of diapers, however, there are still several areas which require additional improvement, such as increasing use of natural resources in the making of diapers. The current concern regarding the role of disposable diapers in landfills require manufacturing and formulation of eco-friendly and less bulky diapers.

References

Al-Mousa, N. (2013). An examination of CAD use in two interior design programs from the perspectives of curriculum and instructors. Canada.: Queen’s University Kingston.;
1989 Endangered wild terrestrial orchids, a main ingredient in Chikanda

Dr H.J. Fisher, University of Pretoria

hennie.fisher@up.ac.za

Key words
Chikanda, terrestrial orchids, African polony/bologna, sustainability, endangered plants

Introduction

Zambia is a landlocked country very much in the centre of Africa, with predominantly high plateau terrain and mostly tropical climate. Various highly threatened (56 Zambian species are on the Red Data List) chikanda orchids (genera Disa, Satyrium, Habenaria and Brachycorythis) are harvested, not only from Zambia anymore, but increasingly illegal cross border imports from Tanzania, Democratic Republic of Congo, Malawi and Angola, to make Chikanda.

It is reported that this Zambian and Southwest Tanzanian delicacy (Veldman, De Boer, Otiena, Gravendeel, 2014) has been eaten by the people of Zambia, northern Malawi and southwestern Tanzania for hundreds of years (Davenport & Ndangalasi, 2003). Also referred to as African polony or Zambian bologna that is also known locally as kinaki, kikanda, chinaka or chikande (Kasulo et al., 2009, Veldman, 2013). It is often eaten as a relish or with nshima (a stiff cornmeal porridge) (Lundmark, 2001, Syampeyo, 2018), and predominantly made from small tubers of various orchid species from various regions in and around Zambia – the bulbs also known as chikanda. The bread bears the unique flavour of each wild tuber species used (Gattuso, 2019).

A 1939 publication, Diet of the Bemba, said it was considered such a low status food that the chief would only accept it as a gift from a poor widow (Richards in Bingham et al., 2008). It is however now an integral part of Bemba tradition, so much so that a new bride often take chikanda to her husband’s family to show respect (Gattuso, 2019). Originally prepared and eaten by people from the Northern and Muchinga provinces, it is today much sought after all across Zambia (but also in neighbouring countries), with important nostalgic meaning. Its production is a huge concern for environmentalist in regard to unregulated harvesting of the chikanda tubers that is a core ingredients of this product, fuelled by urbanisation and the dire repletion of the plants in nature. Rapid urbanisation in Zambia have resulted in changed consumer diets, and prosperity brought renewed interest in traditional foods such as Chikanda (Bingham et al., 2003). People living in cities consider it “special occasion food, served at weddings and to honoured guests” (Gattuso, 2019). Chikanda is now even found in the glossy new supermarkets of Zambia’s capital Lusaka and restaurants, and not only sold in slices by street vendors (Gattuso, 2019). In the past decade Chikanda gained popularity as a nutritious snack, and demand is growing (Davenport & Ndangalasi, 2003, Veldman et al., 2017). These wild food plants may also be an important food source and a survival strategy for those affected by disease (Challe & Price, 2009).

Skyrocketing demand and commercial harvesting (Veldman et al., 2017) has seen increasing illegal trade from Malawi and Angola (Veldman et al., 2014), and the Democratic Republic of Congo (Fay, 2015). It is estimated that even though consumption in Tanzania is low
(Davenport & Ndangalasi, 2003), 2.2 - 4.0 million orchid tubers (worth $US 250 000) are illegally exported from Tanzania to Zambia annually (Davenport & Ndangalasi, 2003, Veldman et al., 2017). This causes increasingly rapid depletion of orchids over all south-central African regions (Bingham et al., 2003). There is however no clear species-level identification of tubers used to make chikanda, making it unclear exactly which species are collected (Veldman et al., 2017).

The aim of this research therefore was to record the chikanda recipe and manufacturing process, in order to understand how the ‘producers’/manufacturers of these breads may do so sustainably in the future. Ethics approval for this research was obtained from the Ethics Committee of the Faculty of Natural and Agricultural Sciences, reference number NAS 134/2019.

Methodology
This is a qualitative case study, where the author recorded the initial interview at Bangweulu wetlands. Bangweulu means “where the water meets the sky”, that is located mostly within Zambia’s Northern Province and recognised by the Ramsar Convention as one of the world’s most important wetlands. It is a 9850 km² wetland that feeds into Lake Tanganyika, which is considered the source of the mighty Congo River. It is a community-owned protected area that is managed by African Parks, who signed a long-term agreement in 2008 with Zambia’s Department of National Parks and Wildlife (DNPW). Their aim is to work with the communities to sustainably manage the wetlands for the benefit of wildlife and people. The wetlands is home to >50 000 people who retain the right to sustainably harvest the park’s natural resources and who depend entirely on the richness the park provides (africanparks.org). The community engagement officer, who was present at the initial chikanda bread ‘demonstration’, as well as the first interview with the demonstrator, was trained in the use of the interview schedule, and a further two interviews were conducted and translated into English.

Findings
A step by step narrative explains the manufacturing of this bread on Shoebill Island in the Bangweulu Wetlands in the Luapula province. The results obtained from the three interviewees were analysed, and provides some insight into the ‘producers’/manufacturers of chikanda, who, it seems, are cooking these cultural delicacies primarily for financial gain. In an area where poverty is rife, it will be difficult to convince people to not purchase chikanda in the face of total species annihilation.

Conclusions and Recommendations
Meta-barcoding, a DNA barcoding and high throughput sequencing (also referred to as Next Generation Sequencing), are used in other research to analyse orchid cake bought in markets on either side of the TZ-ZA Tunduma border in an attempt to identify which orchids are used for chikanda (Veldman et al., 2017). In similar work, 82 interviews were done to determine harvesting areas and sustainability concerns (Veldman et al., 2018). The problem however remains which species of orchids exactly are used for chikanda (Veldman et al., 2014). This research offers some insight into those people making, selling and securing a livelihood through chikanda.
Future work may investigate the use and cultural symbolic use of chikanda through consumer research. To a certain extent the Darwin Initiative community surveys to secure livelihoods for women in poor rural communities are doing some of this (Bone et al., 2017), even though this survey only focuses on the harvesting of the orchids, and not on the end-users. Currently three North-western Zambian Province villages are drafting chikanda conservation plans, written in local languages across literacy levels (Gattuso, 2019).

References
Fay, MF. 2015. Undocumented trade in species of Orchidaceae. 22-meeting of Plants Committee, Tbilisi, October 2015
Kaputo, MT. 1996. The role of ashes and sodium bicarbonate in a simulated meat product from chikanda tuber (Satyria siva). Food Chemistry, 55 (2)
Syampeyo, Y. 2018. Chikanda enabled me to educate my children. https://Daily-mail.co.zm
1991 Participatory Citizenry: Call and response to promote socio-economic development (Informal financial mechanisms, indigenous farming and farmers’ markets) in Hluhluwe, KwaZulu-Natal

Mr G.T. Marovatsanga & Prof U. Kolanisi, University of Zululand
MarovatsangaG@unizulu.ac.za

Key words
Community Engagement, consumer behaviour, sustainability, sustainable socio-economic development systems, livelihood options, wealth accumulation

Introduction
Globally, higher learning institutions (HILs) are required to play a pivotal role in resolving world and local-based challenges. Excellence is therefore expected in teaching and learning, research and also in the recognition, integration and enhancement of community-based knowledge systems. New social contracts between government, society/industries and the institutions of higher learning are being forged. It is imperative however that in community engagement, the higher learning institutions avoid marginalization of the community’s involvement but rather encourage that community members are recognised as co-knowledge producers and co-researchers.

The emergent contextual basis and core-principles of community engagement prompt for a shift from the discipline based boundaries to transdisciplinary interactions, industry-based partnerships and collaborative approaches to enable deeper meaningful engagement with societal issues as opposed to single-directional interventions or ‘hit and run’ approaches that are self-serving, intrusive and extractive, compromising the magnitude impact of engagement from the community perspective and often leading to research fatigued communities. Higher learning institutions are thus obligated to be integrated to communities by playing a pivot role in ‘working with communities for communities’ to resolve complex local and global-based societal challenges as opposed to just ‘using communities to find solutions for communities’. It is therefore, crucial for institutions to establish collaborative and inclusive research methodologies to ensure that community engagement does not exploit communities but rather promotes social justice. Such expectation brings forth a need for a transformative action on how higher institutions implement community engagement pedagogic approaches to engage communities.

This paper titled Participatory Citizenry: Call and response as a medium to promote socio-economic development (Informal financial mechanisms, indigenous farming and farmers’ markets) in Hluhluwe, rural KZN, emanates from an ongoing community engagement project titled Siphila Kanje (This is how we live), led by academics and students from the University of Zululand in partnership with women from Hluhluwe in the Northern KwaZulu Natal Province and the Sweden partners, through a project (South Africa Sweden University Forum - SASUF), which promotes the achievement of Sustainable Developmental Goals (Goals: 1,2,3,5,10 & 17) themed “Social transformation through change: Knowledge and social development strategies for society”. Siphila Kanje is a university-community based research and capacity building project, for the people and with the people.
Methodology
The project approach is interdisciplinary and multi-stakeholder with facilitators from diverse academic, socio-cultural and economic trajectories. Inclusive and participatory-action research is used. Participants take lead in dialogue avoiding the ‘us’ and ‘them’ binaries. Knowledge sharing is two-way and not a one-way top down approach. The project adopts empowerment principles, through facilitated dialogues. An innovative methodology referred to as Call and Response music is used to prompt and encourage full participation. Local languages and frames of references are also used to encourage full engagement. The underlying principles of using this methodology is to encourage communities to take ownership and pride of their socio-economic development and ideologies.

Findings
The project framework emphasises dialogue and community involvement in interrogating and exploring challenges within their given context and promotes a problem solving approach based on lived knowledge and practical experiences. The project is facilitated on a participatory engagement framework, allowing for learning to take place by acknowledging indigenous knowledge systems. Communities take ownership of the project’s objectives and agenda, and its success directly benefits them. All participants’ voices are acknowledged and equally valued, and this reinforces commitment to the cause.

Conclusions and Recommendations
The overall aim of this project is to promote sustainable consumer behaviour, practices and community-influenced wealth creation systems. As such the project helps with information sharing and raising awareness on various subject matter relating to improving quality of life and building community resilience. The project addresses diverse challenges as raised by the community in question. The Hluhluwe ‘Informal financial mechanisms ‘Stokvels’ case study focused on promoting local sustainable food and livelihood option security practices through the use of indigenous wealth creation/generation systems as to sustain community economies. This project model can be adopted as an effective community engagement practice and can be implemented by other academics, researchers, community leaders and community engagement practitioners across various disciplines.

References
-
8. STUDENT PAPERS

1901 The future of environmentally friendly wool scouring alternative (STUDENT PAPER)

Ms K.S. Matlhoko & Dr J.F. Vermaas, University of the Free State
matlhokoks@ufs.ac.za

Key words
Wool, sustainability, scouring, catholyte, detergents

Introduction, problem and objectives of research
Raw wool contains natural impurities such as wool grease, suint, and dirt, which must be scoured before the wool can be used as a textile fibre (Wood, 2012). Wool scouring is the first step in fibre processing that has to be completed with care to obtain optimum wool quality and fibre cleanliness. Traditionally, wool is scoured with a conventional scouring detergent that is specially made for wool fibre; it contains surfactants to break down grease and suspend all impurities in wool (Wood, 2009). However, there are several sustainability problems encountered in the process of scouring wool. Firstly, detergents currently in use have a negative effect on the environment as they are made with chemicals (Kherdekar et al., 2015). Secondly, the scouring process requires the use of high temperatures and large quantities of water (Kherdekar & Adivarekar, 2017). Lastly, the wool scouring process produces effluents that contain highly concentrated pollutants, which require multiple treatment steps to remove and causes a high oxygen demand (Wang et al., 2016).

Apart from the concerns mentioned above, the wool scouring process is a step that cannot be avoided as it plays an essential part in fibre processing to complete other processing steps after scouring. Hence, this study aims at using Electrochemically Activated Water (ECA) as a sustainable alternative for wool scouring. According to Radical Waters (2019), electrochemically activated water is a patented technology that uses water, salt, and electricity to produce a natural disinfectant (anolyte) and detergent (catholyte). Catholyte is an alkaline detergent that removes surface oil and grease by reduction stress (Zeng, 2010); it is deemed eco-friendly since it does not make use of chemicals (Dickerson, 2009). The advantage is that ECA goes back to being normal salt water after approximately 72 hours; it can then be discarded into standard water systems and can be reused without the need to add chemicals. Therefore, it could be re-used in the process. This method of wool scouring could benefit both the environment and wool producers.

Aim: To test the hypothesis that ECA will scour wool more effectively, the same way as conventional scouring detergent does.

Objectives
1. To determine if Catholyte could remove natural impurities from the wool fibre to the same extent as detergent.
2. After scouring wool with Catholyte, entanglement and damage should not be worse than those scoured with detergent.
3. The wool scoured with catholyte should be suitable for further processing like combing, dyeing, printing, and finishing process.

Methodology

Material

Raw, greasy merino wool received from local wool producers is to be used for scouring experiments. Filtered water and electrochemically activated water generated from (Hoshizaki Electric Co., ROX-10WB-E uni), and wool scouring detergent that is formulated for the wool cleaning industry.

Methods

The following scouring solution baths with the following temperatures [room temperature; 45°C; 50°C; and 55°C] are to be prepared: (1) Filtered water only, (2) Filtered water plus conventional wool scouring detergent, and (3) Electrochemically activated water. Wool will be soaked for 15 minutes, and the process will be repeated twice in all baths. After scouring, bath (2) wool will be rinsed with filtered water twice, and sundried. Wool samples will be weighed before, and after scouring; vegetable matter and other impurities will be calculated to get the results. This method of wool scouring is derived from “The art of scouring sheep fleece” by McKenna (2015).

The results obtained from the experiment is to determine the wool cleanliness and effects of scouring detergents on merino wool quality. To calculate the results, ASTM D584 –10 standard test method will be carried out to assess wool base (clean wool content) and wool yield. Wool fibres will also be inspected under a scanning electron microscope to determine any surface changes after scouring.

References

Introduction, problem and objectives of study

Farm workers in South Africa are categorized under a powerless group with a low livelihood (Atkinson, 2007). Farm working households are identified by social discrimination, persistent poverty, high levels of food insecurity, low education levels, lack of access to infrastructure and governmental services (Kruger et al., 2006). The position that most farm works encounter is a result of post-apartheid laws, for instance, the Native Land Act of 1913 law banned black farm working households from accessing land by getting hold of assets outside designated areas called homelands which covered 13% of rural areas (Atkinson, 2007). Therefore, black farm working households who had verbal share cropping agreements with white land owners resulted them and their families losing rights and legal redress (Atkinson, 2007). Land in South Africa, particularly in rural areas has always belonged to the community, with the chief being a custodian of that land. Community members rely on the chief to provide them with land that they can occupy for production purposes (Thamaga-Chitja & Morojele, 2014). However, there are gender issues when acquiring land in irrigation schemes. Women land rights are often violated. They are often limited rights of ownership, access and control of the land (Makhetha & Hart, 2018). Worldwide, irrigation labour is mostly supplied by poor and marginalized farm working groups as well as migrants who lack full protection of the law (Cousins, 2013). Although South Africa produces enough food to feed its population, the country experiences rapid increase rate of household food insecurity due to the rising food prices, particularly of maize and wheat which are the staple diet of the poor, hence they are net buyers of food (Abdu-Raheem & Worth, 2011). In 2015, the Millennium Development Goals (MDGs) came to an end with many developing countries still battling with fulfilling the goals (World Health Organisation, 2015). Ensuring the food security dimensions (food availability, food accessibility, food utilization and food stability) to all, has always been a major policy focus for governments and continues in South Africa and in all fragments of Sub-Saharan African countries to be a barrier in achieving the goal (Sachs, 2012).

Objectives

• To identify different sources of livelihood diversification among farm workers in Tshiombo irrigation scheme.
• To analyse the food security status of farm workers in Tshiombo irrigation scheme.
• To determine factors that influence the dietary diversity levels of farm workers in Tshiombo irrigation scheme.
Methodology

The collected data will be analysed using descriptive statistics such as frequency, percentages and mean. Descriptive statistics will be used to analyse the choice of livelihood diversification strategies to achieve food security by farm workers. A multinomial logistic model will be used to analyse the influencing factors driving the choice of diversification among farm workers in Tshiombo irrigation scheme.

Estimated determinants of farm workers food security status will be determined by an Ordered Probit Model. The Ordered Probit is suitable for modelling with an ordered categorical dependent variable and determine factors that will influence farm workers’ food security status. The dependent variable in this study is household food security, grouped into four ordered categories. The four generic categories will be formulated, in that during a survey a household can fall into any one of the four categories depending on the household’s socio-economic condition. The categories are Q1 (food secure), Q2 (mildly food secure), Q3 (moderately food insecure) and Q4 (severely food insecure).

To determine factors that influence the dietary diversity levels of farm workers in Tshiombo irrigation scheme, the respondents will be asked to recall all food items or commodities consumed in the previous 24 hours prior to the interview. A scale of 15 food groups will be used in assessing the dietary diversity of the respondents. A single point was awarded to each of the food groups consumed over the reference period. Therefore, a Tobit model will be used to estimate the extend of farm workers food security using a dietary diversity score. This model will be used because dietary diversity score is lower censored at zero, with the assumption that some households during the survey may report not eating anything within a period of 24 hours.

References


Exploring agricultural knowledge systems and smallholder farmers’ empowerment: Implication on household food security

Ms N. Tamako, Prof J.M. Chitja & Prof M. Mudhara, University of Kwa-Zulu Natal
nthabietamako@gmail.com

Key words
Knowledge systems, smallholder farmers, food security, empowerment

Introduction
Agriculture is the fundamental economic factor upon which the future of the population depends (UNDP, 2012; Pienaar, 2013; FAO, 2017). According to Bagnall-Oakeley et al. (2004) for rational decision-making, stakeholders in the agricultural sector need several agricultural information services. At the farm level, farmers need adequate skills and technical knowledge necessary to properly combine the four factors of production, namely the land, labour, entrepreneurial skills, and capital (Wiesinger, 2007). Knowledge does not only empower farmers to participate in decision making and to exchange ideas with other farmers but also essential in rural development (Mkenda, et. al, 2017). Access to knowledge and information pertaining to agriculture is essential to increase farm production and build farmers capability and resilience.

The agricultural sector in South Africa has a chain of government and private agricultural research institutes, which uses several channels and different platforms to share knowledge with farmers (Pienaar, 2013). The SA government establish FFS programs, FG, Self-help groups and cooperative to enhance farmers’ knowledge platform and empowering farmers (DAFF, 2017). These knowledge and learning platforms are rooted in farmers’ social structures which are largely self-organised, and locally originated (Lwoga et al., 2013). Thus, a collaboration between farmers, local administration and academics has resulted in agricultural knowledge systems (Smedlund, 2008). Hence, knowledge integration at the individual level is very diverse. The association among various knowledge actors and joint knowledge generation is expanding. Thus, there is a need to categories these knowledge systems accessible to farmers through their social capital to assess their impact on farmers’ empowerment and food security. Knowledge and skills are essential resources for farming (Lwoga et al., 2013). According to the Farmers’ week report, (2012), technical knowledge is by far the most important aspect to ensure that small-scale farmers succeed. Farmers receive most of the technical know-how from agricultural sectors, however, there is a need to look beyond agriculture activity to farmers as a human being. Sveiby (1997) defined knowledge as a capacity to act and further argued that knowledge is conjured up in people heads and that the human capacity to create knowledge is infinite.

Farmers are not isolated individuals in their community (Teilmann, 2012), they are part of many social networks. There is a diversity of knowledge sources and learning forms that farmers use to sustain their livelihoods and food security (RSA, 2014). Farmers in Kwa-Zulu Natal Province have their contacts ranging from group members, traders, friends, neighbours, NGO’s and government. Several government agencies and private agencies work together to circulate knowledge and information to farmers (DAFF, 2016). Farmers use various criteria to
find the importance of sources, including the reliability and quality of data and knowledge received (Teilmann, 2012). Other sources of agricultural knowledge include community leaders and rural elders, some of whom had considerable influence and power, religious institutions and fellow farmers (Kaine et al., 1999) (Munyua, 2011). Opinion leaders who are also local farmers are good sources of knowledge and advice to other farmers (Haldar et al., 2016). However, involving different stakeholders with their various kinds of knowledge a network can enhance its resilience or weaken the network. Thus, understanding the farmers’ knowledge system is important to understand the functioning and effectiveness of these systems in relation to farmers’ empowerment and food security. Furthermore, mapping agricultural knowledge systems and understanding their role in a rural context is important for agricultural interventions. This will help to understand the dynamics of these knowledge networks used by farmers. A study by Demiryurek et al. (2008) and Mittal et al. (2018) mapped the knowledge networks and social networks of farmers and their structure in rural India. A study by Thuo et al. (2013) assessed the role of social networks in how groundnut farmers in Kenya and Uganda acquired information about new groundnut varieties and how their social ties related to groundnut productivity.

According to Awad and Ghaziri (2004) and Sutherland et al., (2017) studies consider knowledge to be social and not private. Furthermore, Tovey (2008) and Hart (2007) state that farmers knowledge is the product of farmers’ curiosity, creativity and efforts which is connected to the actions and social interactions. This implies that the farmers’ knowledge is built on mental capacity and a series of skills to do the labour, which creates a learning skill. Similarly, Hartwich et al., (2007) emphasis that farmers’ knowledge rises from engaging in regular experimental practices, and this leads to learning skills. In this manner, the farmer learns by doing and through learning, as a result, farmers’ knowledge includes social and technical surroundings. Hence, tapping into farmers’ knowledge could ensure efficiency in agricultural empowerment of smallholder farmers. The knowledge they possess needs to be quantified, categorised and formalised. Hence, understanding what knowledge is recognized by farmers, how it is shared and not partaken, and their social interactions in performing such task are important.

Rural livelihoods in South Africa are largely dependent on the agricultural sector. The agricultural sector in South Africa is dualistic; consisting of a large-scale commercial and small-scale subsistence sector (Thamaga-Chitja and Morojele, 2014). Prior to 1994, policy emphasis was placed on the development and support of the formal commercial agricultural sector to the exclusion of a larger number of smallholder farmers (Pienaar, 2013). In 1994, the agricultural policies aimed at empowering smallholder farmers in the form of infrastructure grants, production inputs support, access to loans and extension services. The empowerment of smallholder farmers has been along with the government development agenda for years, as they are greatly disadvantaged, food insecure and have limited access to technology and information (FAO, 2017). New and innovative plan of attacks have been drawn up under National Agenda (SDG’s) and food and nutrition security developments. These strategies include more investment in agricultural productivity through supporting smallholder farmers with necessary resources, i.e. knowledge creation and access, credits, and technology. Smallholder farmers worldwide, including in South African, have poorly developed intangible assets i.e. skills and knowledge (Thamaga-Chitja and Morojele, 2014). Farmers have different agricultural knowledge needs which are relevant to their day-to-day involvement. Therefore,
upscaling social capital to improve agricultural knowledge among farmers is essential to recognize the relevant knowledge and at the proper time.

In South Africa, social capital has a long history, having been promoted by cultural leaders within communities and national government for different objectives (Edwards, 2013). Social capital is the most relevant capital in rural communities. Recently, social capital among smallholder farmers has gained popularity as a channel and platform for agricultural development and programs (Gallaher et al., 2013; Fisher, 2013). The study uses Grootaert (1998) definition of social capital as the complementary norms, values, attitudes, and beliefs that govern interactions among people and institutions and predispose them to cooperation and mutual assistance. The definition provides a useful conceptual framework when seeking to understand how social capitals contribute to farmers’ empowerment. Networks are social capital resources that are drawn upon in learning to manage change (Wambugu et al., 2010). However, these knowledge sources and channels are governed and facilitated by institutions, networks, norms, beliefs, and trust which are all components of social capital (Yami and van Asten, 2018). Institutions are systems that become a vehicle through which people interacts (Ramirez, 1993); (Simpson and de Loë, 2017). Smedlund (2008) argues that commonly agricultural activities are governed by formal written rules and unwritten informal codes of conduct and constraints such as norms of behaviour and conventions of society. In order to capture the intangible concept of social capital, the study will explore its role by measuring and identifying networks, institutions, opinion leaders and farmers’ attitudes towards agricultural knowledge.

Social capital among smallholder farmers is seen as a possible and effective institutional solution to overcome farmers challenges and constraints in developing countries (Cabrera and Cabrera, 2005). A recent study by (Tamako and Thamaga-Chitja, 2017) showed that smallholder farmers have strong social capital despite not being fully utilised to improve farmer productivity, upon which strong technical knowledge sharing can be addressed to benefit farmer productivity.

**Research problem**

South Africa is estimated to have 4 million people engaged in smallholder agriculture for various reasons which include: agriculture as an extra source of food and generating income (Aliber and Hart, 2009). These smallholder farmers are mostly resources poor in marginalized areas that are characterised with low-external inputs, poor soil, and management (Hart, 2007). The development and empowerment of smallholder farmers have been proposed as a strategy to eradicate poverty and food insecurity. This has been a priority to the national and regional level under the SDG’s and MDG’s (FAO, 2017). The empowerment of smallholder farmers is highly prioritised with the motive that smallholder farmers can feed the growing population. This study uses the World Bank description of empowerment as the process of increasing the capacity of individuals or groups to make choices into desired actions and outcomes. The FAO report (2017), the limited access to agricultural knowledge has a significant effect on smallholder farmers. Munyua and Stilwell (2013), argues that the restriction of knowledge among farmers, and other sectors are the key issue in pro-poor agricultural development. Scholars and extension officers are among the most knowledge-intensive elements of agricultural knowledge sources through demonstrations and group meetings (Allahyari et al., 2017). Studies concerning ways in which farmers obtain and share knowledge are extremely useful to farming systems. Thus, the capacity and capability of a farmer to absorb the incoming knowledge and sharing it are crucial for farmers’
Farmers' have their own motivations and values: rational, ethical and emotional, socially considerations that guide them when they choose which knowledge to acquire, the sources they will explore and the forms of learning they adopt. All these factors are triggered by knowledge. Agricultural knowledge is a vital tool for improving the livelihoods of small-scale farmers.

There is a need to assess social networks that link farmer-to-farmer and farmer to the sector to create a farmer-led-research which empowers farmers. Farmer-led-research (FLR) is also known as farmer participatory research, which is an approach that empowers farmers to collect knowledge for their own farms while collaborating with other farmers and scientists, contributing to peer-to-peer learning and knowledge sharing among farmers (Zeweld et al., 2017). Farmers have different networks and platform to acquire and obtain agricultural knowledge in their communities, and these are influenced by existing community networks and institutions, i.e. Norms (Kauti, 2016).

In SA, the department of agriculture, fisheries, and forestry (DAFF) have encouraged the formation of co-operatives, self-help, extension officer interaction as the strategies to empower smallholder farmers with knowledge (Ngaka and Zwane, 2017). This has led to the development of cooperatives, farmers’ group, farmers training, and site visits. Social capital, as the most valuable asset of the resource-poor, can be used to reach the marginalised group. Hence, understanding the complexity of social capital within a community can lead to a better understanding of the marginalised and the disempowered farmers. Thus, there is a need to assess how the existing social network and platform can be used for empowering knowledge of smallholder farmers. These observations have led to conclude that knowledge and skills are essential resources for farming and studies on the ways in which farmers obtain and share knowledge could be valuable to farming systems research and extension and informing policy. Governments and development agencies have put more attention in the empowerment of rural farmers and communities through collective action institutions through identifying such institution as important networks of partnership in the implementation of agricultural development (Ngaka and Zwane, 2017).

Agricultural development has largely focused on improving tangible assets with less focus on intangible assets such as farmers’ capacity and capability. The role of knowledge systems in farmers’ empowerment has not been fully researched among smallholder farmers. Rural development policies had designed frameworks to help organise farmers into groups and farmer organisations to ensure targeted delivery of services. Farmers and farmers group work with other farming systems groups, researchers and the private sector to form partnerships. These partnerships had led to the development of knowledge networks. Although farmers have operated in particular knowledge systems, the types of knowledge, usage, and sharing of knowledge for empowering and sustain their livelihoods have not been fully researched and documented in order for improvement to emerge. This research will assess the following:

**Research objectives**

To explore agricultural knowledge systems and smallholder farmer empowerment with special focus on social capital and social learning platform.

**Objectives**

1) To describe the agricultural knowledge systems and the types of knowledge occurring.
2) To identify leaders and opinion leaders’ social network and their influence on the quality of agricultural knowledge.
3) To assess the agricultural knowledge systems in relation to farmers’ empowerment.
4) To assess current agricultural knowledge system in relation to food security.

Methodology

The study will use a mixed method for data collection. A mixed method approach combines the collection and analysis of qualitative and quantitative data. A qualitative research approach is an investigation in which data will be collected in face-to-face situations by interacting with selected individuals (Creswell, 2013). A qualitative approach assisted in answering questions about the nature of the problem, with the purpose of understanding it from the participants’ point of view (Hsieh and Shannon, 2005). Qualitative research methods will be used to identify the information behaviour of small-scale farmers, to investigate the linkages and flows of knowledge and information between stakeholders. Quantitative research methods will be used to collect quantitative data such as providers of agricultural related information, where farmers get their agricultural-related knowledge and information and the channels of communication. Focus group discussions will also be conducted with the purpose of gathering in-depth information on social capital, a structure in the community and their main activities. The focus group discussions will be used to establish the active social groups in the community, further, explore how the social capital has been used by farmers to transfer information and knowledge across farmers and government agencies. The study population will be 200 small-scale farmers in uMshwathi municipality consisting of; farmers group members, individual farmers, key informants and opinion leaders. For analysis of closed-ended questions, a computer program known as Statistical Package for Social Sciences (SPSS) will be used. Descriptive statistics and Chi-square tests will be used to analyse the data which was presented in the results section using tables and graphs.

References


 Consumers’ motives for complaint behavioural intention following service failure in the clothing retail context (STUDENT PAPER)

Ms F.A. Treurnicht, Mrs L. Diedericks, Dr S. Donoghue & Dr B. Jacobs, University of Pretoria
treurnichtfa@gmail.com

Key words
Consumer dissatisfaction, service failure, clothing retailing, consumer complaint behavioural intention, motives

Introduction, problem and objectives of research

Consumers have specific expectations about clothing retailers’ in-store service delivery, including the physical environment, physical goods, service, and personnel (Terblanche & Boshoff, 2003). Service failures arise when perceptions of performance are lower than expectations, resulting in dissatisfaction (Tronvoll, 2007). Consumers may react to their dissatisfaction by engaging in consumer compliant behaviour, including behavioural and non-behavioural responses (Singh, 1988:94). Behavioural responses may be directed at retailers, significant others and third parties, including newspapers and consumer protection organisations (Day & Landon, 1977). Formal complaints to clothing retailers are to their benefit as they get the opportunity to resolve product/service problems. However, private complaint behaviours, including negative word-of-mouth to family and friends, switching between retailers, and public negative electronic word-of-mouth via the Internet, are very damaging to retailers’ reputation and business (Chan, Ha, Lee, Yung & Ling, 2016; Yılmaz, 2016). With regard to non-behavioural responses, some consumers may choose not to voice their dissatisfaction, implying that retailers are unaware of product or service shortcomings (Heung & Lam, 2003). Although non-complainers appear apathetic, their attitude toward the retailer or brand is likely to be less positive than before.

Previous research in different product/service context have shown that the main reasons for engaging in specific complaint behaviours include warning other people; seeking solace; calming down; venting anger and frustration; getting revenge; punishing or damaging the company; seeking advice from others who have similar problems, and seeking empathy (Heung & Lam, 2003; Nimako & Mensah, 2012). Generally, altruistic reasons, helping or warning friends/others, reciprocity, damaging the company to blame for the dissatisfaction, and egoistic reasons such as venting anger, anxiety reduction, and advice seeking, sharing bad experiences with others to get some understanding in return, are noteworthy motives which drive consumers to engage in specific complaint behaviours (Loo, Boo & Khoo-Lattimore, 2013; Yılmaz, 2016). Reasons why dissatisfied consumers do not complain include consumers’ perceptions that complaining would not be worth their time and effort, and the emotional difficulties that individuals encounter when complaining and the cultural inappropriateness of doing so (Heung & Lam, 2003; Kim, Kim, Im & Shin, 2003). Furthermore, it has been suggested that retailers typically do not encourage customer feedback or complaints and that complaint channels are not easy to use (Nimako & Mensah, 2012).

As service failures are inevitable and consumers are bound to complain an understanding of how and why clothing consumers complain following in-store service failure is important to
facilitate clothing retailers to correct service failures and to handle customer complaints more effectively to ensure customer satisfaction, enhance customer loyalty for re-purchase, encourage positive word-of-mouth, and generate profit. On a much deeper level it is important to understand the driving force behind consumers’ complaint behavioural intentions as specific motives may drive specific consumer complaint behaviours in the clothing retail context. Knowledge about customer complaint motives would enable service employees to employ appropriate complaint handling strategies.

**Problem statement and research objectives**

Although studies have been conducted in the South African context about consumers’ perceptions of clothing quality (De Klerk & Lubbe, 2008; Du Preez, Dreyer, Botha, van der Colff, Coelho & Pretorius, 2018) and of service quality in clothing retail stores (Terblanche & Boshoff, 2003), studies on the motives driving consumers’ complaint behaviour about service failures in the clothing retail context is lacking. This is surprising given the fact that understanding customer complaint motives is critical in recovering service failures and handling complaints. An understanding of the motives for consumer complaint behaviour could help clothing retailers to understand the value of paying attention to and dealing with consumer complaints. The aim of this study is, therefore, to explore and describe the motives underlying consumers’ complaint behavioural intentions following in-store service failure in the clothing retail context. The objectives include an exploration and description of consumers’ perceptions of in-store service failures, of their consumer complaint behavioural intentions, and of their motives underlying the complaint behavioural intentions.

**Methodology**

This study will employ a cross-sectional survey design, using a self-administered structured online questionnaire. Respondents will be recruited using non-probability convenience sampling, snowball sampling and quota sampling. Fieldworkers will distribute the link to the questionnaire using WhatsApp and e-mail. Descriptive and inferential statistics will be used to analyse the data. The results will be interpreted in terms of specific motivational theories.

**References**


1930 Sensory acceptable product development of *Cissus quadrangularis* to create awareness among young adults (STUDENT PAPER)

*Ms V. Singh, Dr A. Naiker & K. Govender, Durban University of Technology*

*Viharasingh06@gmail.com*

**Key words**

Knowledge systems, smallholder farmers, food security, empowerment

**Introduction, problem and objectives of research**

The nature of this upcoming product development research study is to develop a sensorially acceptable food product using Cissus Quadrangularis (Vitaceae), also known as “Hadjod” in order to create awareness of Hadjod and its benefits among young adults. Nutrition and food security are interrelated; however, food security looks at four sectors such as availability of food, access to food, utilization and stability (Wustefeld, 2013). One of the main causes of food insecurity is drought. Drought resistant foods are vital and come in the form of some wild plants. South Africa has a wide range of wild plants that offer medicinal value (South African Medicinal Plants 2018: 1). However, most of these plants are used by older generations and are unfamiliar to younger generations (Inglehart et al 2000:3). One such unfamiliar wild plant is Cissus quadrangularis. Cissus quadrangularis originated in Asia and Africa (Siddiqua et al 2017: 330). Cissus quadrangularis grows all over South Africa yet goes unnoticed by many people. However, among some people in South Africa, especially the older Indian generation, it is quite popular and called Hadjod (Translated as “Bone- Setter”). It is also known as Hwebe kwalehra in some African and diaspora cultures. According to Brahmkshatriya et al (2015: 169-173), Cissus quadrangularis has a high amount of Vitamin C, Vitamin A and Calcium as well as Potassium, Iron, Zinc and Ascorbic Acid. Cissus quadrangularis is also said to possess anti-inflammatory properties, lower cholesterol levels, aid in boosting immune systems as well as aid in the treatment of skin diseases, colic, epilepsy, swellings and flatulence (Malathi 2014: 3). The aim of the study is to determine the knowledge, use and perceptions of Cissus quadrangularis among elder community members in order to develop a sensorially food product to create awareness of Hadjod and its benefits among young adults.

**Methodology**

The study will use a mixed methods approach to explore the familiarity of Cissus quadrangularis and to determine the acceptability of a new Cissus quadrangularis containing
food product. The purpose of the qualitative aspects of this research is to determine the South African Indian Local community’s knowledge, uses and perceptions on Cissus quadrangularis, as research conducted showed that South African Indians have previously used/cooked the plant, this will be conducted via 15 key informant interviews. The quantitative aspect of this study will involve sensory evaluation using a validated 9-point hedonic scale and a paired preference scale. Sensory evaluation will be conducted to determine if the product is sensory acceptable. The sensory analysis tests administered will have a total of 110 participants. The study will use other methods such as, product development, development of an awareness tool, nutrient, microbial and shelf life analysis which will be conducted on the developed food product, these tests will be used to determine safety and nutritional benefit of the developed food product. The afore mentioned tests will be conducted in a laboratory. The preliminary results obtained from the study will be pivotal in developing a trendy food product with Cissus quadrangularis as the main ingredient. Once the food product is developed and all above mentioned tests are conducted, an awareness tool will be developed aimed at young adults, depicting the product developed and information on Cissus quadrangularis using videography. Cissus quadrangularis possesses many different health and medicinal benefits (Malathi 2014: 3), thus the development of a trendy food product with Cissus quadrangularis could assist Souths African’s in addressing problems associated with both under/over nutrition.

References
Triangulation water retting of *Agave Americana* L. leaves to extract fibre: Prospective and sustainable fibre extraction procedure

Ms M. Mafaesa, Prof H. Steyn & Dr M. De Wit, University of the Free State

mamthimafaesa@gmail.com

Key words

*Agave Americana* L. fibre, Agavaceae, Agave, fibre extraction, lignocellulosic fibres, physico-mechanical properties, sustainable fibre, triangulation water retting

Introduction

*Agave Americana* L., ("Pita") fibre is a natural, long and strong, but stiff, fibre extracted from *Agave Americana* L. plant leaves (Mafaesa 2006:66, Saravanan 2018:1). The *Agave Americana* L. plant is a monocotyledonous, monocarpic, huge, herbaceous evergreen and perennial plant with long, rhizomatous succulent spiny leaves growing directly out from the central stalk to form a dense rosette (Saraswat & Gope 2014:1). It is of a botanical genus, Agave and family; Agavaceae (Bouaziz et al. 2014:1). The *Agave Americana* L. leaves are usually pre-treated with conventional water retting to extract fibre. The conventional water retting is the process of submerging solid, whole leaves of *Agave Americana* L. plant in open water in order to decompose the non-cellulosic biomass and facilitate proper fibre extraction. However, the conventional water retting contaminates the environment as it decomposes the whole solid leaf bio-mass and fetters the fibre colour, texture and quantity. The aim of the research was to extract the *Agave Americana* L. fibre with a triangulation water retting technique as an alternative to conventional water retting since its components can complement and supplement each other so as to minimise environmental impact, improve fibre colour, texture and quantity and to test for fibre physico-mechanical properties. The triangulation retting of *Agave Americana* L. leaves consists of ribbon stripping; closed tank water retting techniques accelerated the retting process and improved fibre quality and quantity. It is also cost-effective; however it is labour intensive.

The aim of the research was to extract the good quality *Agave Americana* L. fibre that can be useful for textile application, with triangulation water retting as a sustainable alternative to conventional water retting; and to determine the maximum load (N), displacement at maximum load (mm) and initial Young’s modulus (MPa) and the physical properties which include colour, texture, fineness and density of the extracted raw fibre.

Methodology

Two younger, two middle and two older leaves were harvested from each of three wild *Agave Americana* L. plants. The marginal and tip spikes of freshly harvested leaves were removed. The leaves were then ribbon stripped, submersed in cold tap water at atmospheric temperature in heavy duty plastic containers; tightly closed. Monitoring was conducted intervals of five days. After retting was completed, the fibre was separated from the pith by washing it in several times in water to remove the softened flesh. The extracted fibre was air-dried for 24 hours. The following *Agave Americana* L. fibre tensile properties; maximum load (N), displacement at maximum load mm and initial Young’s modulus (MPa) were determined using
Instron 4200/4300/4400 tensile tester. The fibre surface properties that include colour and softness were evaluated with the subjective hand and evaluation method by a panel of 11 assessors from the Consumer Science Department at the University of Free State. The fibre physical properties were also determined with scanning electron microscope (SEM) and the bending length was determined with Shirley stiffness tester.

Results

Triangulation water retting was shorter and produced less smell than the open conventional water retting. This reduced ecological pollution, health hazard and risk for a researcher and people nearby. The by-products in waste water were buried in garden soil to improve soil fertility. Younger leaves completed retting within 10 days and older leaves within 24 days. The triangulated fibre was found brighter in colour and, softer in touch and shinier than fibre that was conventionally retted (Majumdar et al. 2013:8-9). The older leaves produced more and coarser fibre than the fibre extracted from the young leaves. The SEM revealed that the fibre is a natural technical fibre composed of ultimate fibrils embedded in the natural non-cellulosic fibre constituents. The fibre was cylindrical in shape, rough surfaced with cracks causing some parallel ridges and splits. Overlapping micro-fibrils that run parallel to the fibre’s axis were observed with waxy and protruding parts. The maximum tensile load carried ranged from 4.7 to 22.61 N and displacement at maximum load from 28.27 to 46.65 mm and young’s modulus from 215.90 to 598.13. Fibre fineness, texture, colour and lustre improved but vary due to fibre age and position in the leaf. The bending length of raw Agave Americana L. fibre was found very high; ranging from 5.6 to 7.4 cm. The fibre properties varied substantially. This variability can be explained by irregular structure of the micro-fibrils, plant leaf maturity levels and to different growing conditions.

Conclusions and Recommendations

The triangulation water retting of Agave Americana L. leaves is more eco-friendly, cost effective and quick technology with higher fibre yield, improved colour, lustre and texture with less environmental impact than the conventional whole leaf water retting technology. It is believed to be a potential source for natural cellulose textile fibre that can be sustainably improved for textile application.

References

Sequential enzymatic bio-softening of Agave Americana L. fibre: An essential tool for sustainable textile innovation in the 21st century

Ms M. Mafaesa, Prof H. Steyn & Dr M. De Wit, University of the Free State
mamthimafaesa@gmail.com

Key words
Agave Americana L. fibre, enzymatic biosoftening, biodelignification, bioscouring, biobleaching, biopolishing, sustainable textile processes

Introduction
Agave Americana L. fibre is evolving as an unconventional source of textile fibre because it is biorenewable, biodegradable, has a positive impact on CO2 emissions and superb physico-mechanical properties (Hulle et al. 2015: 65 & 73). However, it is very stiff since it contain high amounts of non-cellulosic components hinders it to become a textile fibre. The harsh chemical softening processes are normally used to efficiently remove these impurities but they are discouraged for eco-socio-economic reasons such as the increased awareness of the detrimental impact of textiles on environment, human toxicity, resource depletion, large amounts of water and energy consumption and greater chances to damage the cellulose especially in the presence of oxygen (Ahmad et al. 2019:11). The enzymes are increasingly becoming acceptable and innovative textile biotechnology that has more eco-socio-economic benefits than its chemical counterpart. Enzymes are efficient, selective, accelerate and speed up reactions by forming transition state complexes with their substrate which reduces the activation energy of the reaction (Bharathi & Kanaka 2015: 4857, Šimić et al. 2015:50) Enzymatic upgrading of textile fibres are effective, economical, eco-friendly and less health hazardous as compare to the chemical-based approaches (Suparna & Rinsey 2016:68). It is an alternative approach to the use of harsh chemicals used in textile processing to improve the lignocellulosic textile fibres properties (Chatha et al. 2017:14005). It is an essential tool for upgrading the unconventional lignocellulosic fibres such as Agave Americana L. into sustainable eco-friendly fibres for 21st century (Munjal and Kashyap 2013:1080-1081). Recently, textile researchers are exploring more on enzymatic biosoftening processes to minimise textile environmental challenges (Usluoğlu & Arabaci 2015:3280).

There are a very few studies conducted on the effects of enzymes used to biosoften Agave Americana L. fibre. The aim of this research was to assess the effects of sequential biosoftening of Agave Americana L. fibre using manganese peroxidase, pectinase, xylanase and cellulase enzymes respectively to improve its physico-mechanical textile properties such as texture, colour, flexibility, fineness, softness, smoothness maximum load (N) displacement at maximum load (mm) and Young’s modulus (MPa).

Methodology
The Agave Americana L. fibre was sequentially treated with individual alkaline commercial enzymes. The bio-delignification with manganese peroxidase, bio-scouring with pectinase, bio-bleaching with xylanase and bio-polishing with cellulase were conducted successively: The three raw dry fibre samples weighed to 3g each. They were pre-boiled in water for 15 minutes.
Tris – HCl buffer for use with commercial MnP and NaOH-glycine buffer for use with pectinase, xylanase and cellulose enzymes were prepared. Manganese Peroxidase enzyme-buffer solution of 0.02g: 22.5 mL at (pH 8.7) was prepared for each sample and poured over the pre-treated wet fibre sample in the 250 mL conical beakers. The beakers were shaken to mix content and covered to minimize the evaporation. The fibre was then incubated for 72 hours (3 days) at controlled temperature of 50˚C in a convection oven. At the end of treatment time the enzyme was inactivated by boiling the fibre samples in water for 10 minutes; thereafter, the fibre samples were washed twice in cold tap water and rinsed once with distilled water. The subsequent pectinase treatment started: pectinase enzyme-buffer solution of 0.5g: 60 mL at (pH 8.5) was prepared for each sample and the same procedure as above was followed but with 60 minute incubation time. Xylanase-buffer solution of 0.1g: 60 mL at pH 8.5 was prepared and used as mentioned above but with 8 hrs. incubation time. Finally the cellulose-buffer solution of 0.1g: 60 mL at pH 8.5 was prepared and the same procedure as above was followed but with the incubation time of 2 hours. Thereafter fibre samples were air-dried and reweighed. The fibre weight loss percentage was calculated from the initial and final fibre weight differences. Maximum load (N), displacement at maximum load and initial Young’s modulus of the treated fibre were tested using Instron 4200/4300/4400 tensile tester. The structural morphology of treated fibre were assessed using scanning electron microscope (SEM). The physical properties that include fibre fineness, lustre, colour and brightness were subjectively evaluated using visual and hand method by a panel of 11 assessors from the department of Consumer Science at the University of Free State. The bending length was assessed with Shirley stiffness tester.

Results

The *Agave Americana L.* fibre samples biosoftened with manganese peroxidase, pectinase, xylanase and cellulase respectively, were extracted from the middle leaves of plant 1, 2 and 3. were was the whitest, brightest in colour, softest and smoothest of the three, two and single enzyme treated fibre samples. The longitudinal SEM micrographs illustrated fibre defibrillation into numerous, loose, flat, ribbon-like ultimate fibrils twisted like cotton fibre. Maximum weight loss percentage of 24% was observed from the fibre obtained from plant 2 and then followed by 21% of the fibre harvested from plant 3 and the least 18 % of the fibre from plant 1. The results indicate that the percent weight loss increases with increased severity of the treatment conditions of enzymolysis. This weight loss occurs due to the removal of impurities from the Agave Americana L. fibre. During the enzyme treatment, hydrolysis of lignin, pectin and hemicellulose occurs along with the removal of other impurities. Maximum strength load of 16. 08 N was observed from plant 1 fibre and then followed by 11.80 N from plant 2 fibre and finally, 8.50 N of plant 3 fibre. Maximum strength displacement at maximum load of 42.41 mm was observed from plant 2 fibre and then followed by 34.06 mm from plant 3 fibre and finally, 20.12 mm of plant 1 fibre. Maximum Young’s modulus of 1101.54 MPa was observed from plant 2 fibre and then followed by 468.54 MPa from plant 3 fibre and finally, 315.10 MPa from plant 1 fibre. To soften the fibre surface, an individual enzyme performed a specific function only during the particular treatment time. The impurities were then unevenly hydrolysed to provide a clear pattern of actions on fibre physico-mechanical properties, as enzymes never acted synergistically. The bending length found high since it ranged between 5.6 and 6.1cm over 8 cm.
Conclusions and Recommendations

The enzymatic biosoftening had a considerable, softening and sustainable effect on physico-mechanical properties of Agave Americana L. to meet the textile requirements. The innate potential of lignocellulolytic enzymes to bioprocess the Agave Americana L. fibre is eco-friendly and identifies opportunities to discover novel biotechnological applications and products. Further research on enzymatic biosoftening of Agave Americana L. fibre with simultaneous combination of lignocellulolytic enzymes to further improve the results by removing impurities more evenly as the enzymes can acts synergistically is essential.

References

1935 Manganese peroxidase (mnp) delignification of Agave Americana L. fibre: A novel; sustainable textile technology

Ms M. Mafaesa, Prof H. Steyn & Dr M. De Wit, University of the Free State
mamthimafaesa@gmail.com

Key words
Agave Americana L. fibre, biosoftening, enzymatic delignification, Lignocellulosic fibre, lignocellulolytic enzymes, manganese peroxidase, textile technology

Introduction
The ever-increasing environmental concerns, sustainable textile concepts, consumer awareness and diminishing textile resources enthused researches of green, renewable, biodegradable, “zero-waste” materials into viable and sustainable textile products (Naidu et al. 2017:2082). Agave Americana L. fibre is a non-conventional fibre; extracted from the Agave Americana L plant leaves. The Agave Americana L. plant; century plant is a monocotyledonous, monocarpic, herbaceous and perennial plant with long, rhizomatous
succulent spiny leaves growing directly out from the central stalk to form a dense rosette (Mafaesa 2006:5 & 7). It is of a botanical genus of Agave family of Agavaceae (Hulle et al. 2015c:65 & 66, Naidu et al. 2017:2083). It is a wild, organic plant that survives under harsh arid and semi-arid growing conditions in Lesotho (Thamae 2008:56). The Agave Americana L fibre is an elongated multicellular fibre bundle, consists of individual microfibrils. It is renewable, decomposable, eco-friendly textile potential benefits; alternative to depleting non-renewable fossil-based synthetic fibres; but it has been under-developed. It is a long, strong but stiff, coarse and hard-surfaced, fibre consists of the three main structural components such as cellulose, lignin and hemicelluloses. Lignin is responsible for fibre strength and stiffness Sari et al. 2017:3039), but it has a negative structural and morphological influence on the fibres and must be removed to soften fibres for textile functions.

Delignification is the process through which lignin is removed (Mojsov 2014:136). The conventional chemical technology has been used efficiently to remove lignin and soften lignocellulosic fibre. However this technology is harsh, health hazardous and causes environmental pollution (Chatha et al. 2017:14014). Thus cleaner, greener, milder and environmentally friendlier fibre softening avenues are explored (Rwawiire et al. 2015:1). Enzymatic biotechnology is more effective, eco-friendly and less health hazardous as compare to the physico-chemical processing approaches (Martínez et al. 2009:348, Madadi & Abbas 2017:1000398). It is an acceptable lignocellulolytic, catalytic alternative to the harsh chemical processing on textiles (Bharathi & Kanaka 2015: 4857-4859). Manganese peroxidase (MnP) enzyme is considered among the best enzymes in delignification (Usluoğlu & Arabaci 2015:3280). The aim of this study is to delignify Agave Americana L. fibre using commercial MnP enzyme and characterise the fibre for textile properties.

**Methodology**

The three (3) g of Agave Americana L. fibre was weighed. The weighed Agave Americana L fibre samples were boiled for fifteen minutes to wet them, 0.02g Manganese Peroxidase enzyme was weighed and 22.5 mL of Tris–HCl buffer (pH 8.7) was measured for each sample. The enzyme-buffer solution was prepared. The boiled wet fibre and enzyme-buffer solution were added in 250 ml conical beaker which was shaken to dissolve the enzyme as well as to mix all the reagents. The sample was then incubated for 72 hours (3 days) at 50˚C in conventional laboratory oven. During incubation the beaker was shaken at 12 hrs intervals to distribute and mix enzyme solution evenly to wet the fibre sample. At the end of treatment time the enzyme was inactivated by boiling the fibre in water for 10 minutes. Finally, the enzyme treated fibre sample was then washed thoroughly with tap water and rinsed once with distilled water, air-dried for 24 hours and reweighed. The fibre bending length was assessed using Shirley stiffness tester, weight loss was calculated as the difference between the initial and end of process weights, the tensile/mechanical properties were tested with Intron 4200/4300/4400 tensile tester. The structural properties were evaluated with scanning electron microscope (SEM). The fibre colour, texture and other surface properties, were determined through subjective test conducted by 11 panel evaluators from the department of Consumer Science in the University of Free State.
Results

SEM micrographs confirmed that Agave Americana L. fibre is a multi-cellar bundle consists of micro-fibrils bound by extra cellular non-cellulosic components. Structural defibrillation resulting into ultimate fibres that are ribbon like structures, separated from fibre bundles was observed as an indication of MnP activity on the fibre. The innate coarseness, rigidity, hard feel and weight of Agave Americana L. fibre were also reduced as an indication of positive impact of MnP biosoftening. The negative impact was evidenced with decreased tensile strength. The stress-strain curve showed the typical behaviour of a viscoelastic lignocellulosic fibre with constant stress increase up to the breaking point at maximum load. The fibre weight loss was recorded ranging from 10.65% to 11.65% as an indication of lignin solubilisation. The tensile properties observed are as follows: Maximum load; 9.03 N, displacement at maximum load; 39.17 mm, Young’s modulus, 366.90 MPa. Lignin is also responsible for fibre discolouration. It was observed that its removal improved colour and colour brightness as evidenced by results from subjective evaluation, where 79% of panel evaluators have been in agreement that delignified Agave Americana L. fibre colour ranges from off-white to white. The average bending length was found as 6.05 cm out of 8 cm.

Conclusion

Manganese peroxidase delignification was found to be an effective, efficient and socio-eco-friendly biotechnology that removes lignin to soften the Agave Americana L. fibre for textile use.

References

1974 The development of an entrepreneurial orientation measurement instrument for South African small businesses that offer custom-made apparel (STUDENT PAPER)

Ms M.H.H. Makopo, Unisa
makopmmh@unisa.ac.za

Key words
Small business, entrepreneurial orientation, custom-made, micro enterprises, SMMEs

Introduction, problem and objectives of research
Small, medium and micro-sized enterprises (SMMEs), also called “small businesses” (BER 2019) are considered to play an important role in the economy of many countries, including South Africa (BER 2019; Makopo, de Klerk and Donoghue 2016). Particularly, micro enterprises that manufacture custom-made apparel for individual customers are very common and on the increase in South Africa (Grant 2013; Tselepis 2013). This can be attributed to changes in the South African clothing and textiles industry, which left many people jobless. This industry previously employed many low skilled individuals from poor communities (Vlok 2006), partly due to its labour-intensive nature. South Africa’s national unemployment rate is alarming. The Quarterly Labour Force Survey for the second quarter of 2019 revealed that the official rate of unemployment increased by a percentage of 1.4 to 29.0 % from 27.6% in the first quarter of 2019 (Stats SA 2019). Although unemployment is high for both youth and adults, it remains relatively high among women than men (Stats SA 2019; Stats SA 2018). In the second quarter of 2018, unemployment rate was 29.5% amongst women compared to 25.3% amongst men (Stats SA 2018). The role played by small business sector in the South African economy attracted a lot of support from the South African Government. The country’s National Development Plan 2030 proposed that by 2030, 90% of employment should be created by SMMEs to relieve unemployment, with manufacturing as one of the sectors prioritised (Thulo 2019; Oxford 2014:5). During the State of the Nation Address (February 2019), President Cyril Ramaphosa emphasised the significance of Small Business Incubation Programme.

The failure rate of SMMEs in South Africa is one of the highest in the world, with 75% of new businesses not becoming established (SME Reports 2014). Particularly, home-based businesses, exhibit higher hazards and closure rates (Rogerson 2000). Evidence suggests that many women who own micro enterprises, participate in less dynamic markets with low profits, like clothing firms and bead making (Grant 2013), where little attention is given to developing products that can influence the success of a business (Brink et al. 2003). This indicates survivalist entrepreneurship. These reports suggest that small businesses suffer from inherent challenges that should be explored and understood, for relevant intervention strategies. The underlying factors motivating the start-up of MCAEs in SA and how well owners are entrepreneurially orientated to run the businesses successfully is of interest to the researcher. Today’s business owners should be highly innovative to be profitable.

Aim: To explore sustainable business practices, as well as entrepreneurial orientation of female owners of informal MCAEs in the Gauteng Province
Objectives:
1. To explore the underlying motivating factors behind the start-up of female owned MCAEs.
2. To determine how female MCAEs owners describe “entrepreneurial success”
3. To determine how EO emerges in the female owners of MCAEs in terms of:
   a. Innovativeness
   b. Risk-taking
   c. Pro-activeness
   d. Competitive aggressiveness
   e. Autonomy
4. To propose a measurement instrument for (IEO) for SA small business entrepreneurs.

Methodology
A qualitative research design will be followed to explore and understand a phenomenon about which very little is known. A case study approach will be used for in-depth investigation of a phenomenon in its natural context (Wahyuni 2012; Maree 2007, p 75; Williams 2007). Each MCAE owner and the environment in which the business is operating will constitute a case. Observations accompanied by field notes will ensure credibility (Korstjens and Moser 2018). Interviews will continue until data saturation. The sample size will be confirmed once the study has commenced. Micro enterprises are chosen based on reports that they dominate among small businesses providing employment opportunities to most unskilled individuals in SA. The purposive sample will consist of female owned MCAEs in Gauteng Province, who’ve been in business for 3 or more years with a maximum of 5 employees.

Assessment of IEO for MCAEs could inform what needs to be done to improve current business practices, to ensure sustainability. The study will contribute to a gap of knowledge in the development of a validated IEO measurement instrument to test individuals in SA. The instrument can be used to determine career possibilities and to assess potential as entrepreneurs. It could also benefit potential investors who consider supporting business proposals.

References
1985 Food safety knowledge and awareness in the hospitality industry within Mhlathuze municipality, KwaZulu-Natal Province, South Africa (STUDENT PAPER)

Ms Mngoma, Dr J.J. Sibanyoni & Dr D. Beswa, Unisa
Thulimngoma12@gmail.com

Key words
Food safety, hospitality industry, food safety knowledge, food safety awareness, food handlers

Introduction, problem and objective of the research

Food borne diseases are a major public health concern in the food industry. The hospitality industry is no exception to other eating establishments as it is prone to food borne outbreaks and diseases. Despite the economic benefits of hospitality industry, food safety knowledge and awareness in the hospitality industry pose potential hazards especially when food is not hygienically prepared. In nowadays, consumer’s interests on food safety is increasing due to an increased numbers of food borne outbreak incidences.

Problem Statement: The lack of knowledge and awareness on food safety in the hospitality industry may result in the consumption of contaminated food, which will increase the risks of food borne outbreaks and diseases. The World Health Organisation (2015) reported the food borne diseases as the causes of about 600 million illness episodes, 420 000 death and 33
million healthy life years lost globally. Africa has the highest share of food borne diseases, which over 91 million people falling ill and 137 000 deaths annually (WHO, 2015). Hence Africa’s share represents 1/3 of the global death toll due to food borne diseases. About 79% cases reported to Centre for Disease and Control (CDC) occurred in the sit-down establishments in the United States of America (Angelo et.al, 2016). Australia reported between 2001 and 2011 a total number of 3250 cases, 650 individuals hospitalized and 4 cases of death (Moffat et al., 2016). In the statistics mentioned, 102 cases were link to commercial food providers, restaurants, bakeries, fast food premises and caterers. South Africa is no exception as unprofessional food safety practices within the manufacturing and hospitality industry has caused contamination and this has led to substantial illness for consumers (Department of Health, 2017).

The estimated burden of food borne diseases in South Africa is not clearly established, due to underreporting. However, the National Institute for Communicable Diseases (NICD), 2018) reported 327 food borne disease outbreaks from January 2013 to December 2017, causing illness in 11 155 people, with 8 680 hospital visits, 494 hospital admissions and 49 deaths). Most outbreaks reported are from KwaZulu-Natal (43.1%), Gauteng (19.3%) and Mpumalanga (12.2%) Province. In 2018, the NICD (2018) reported 180 death of consumers from eating cold meat products of Enterprise food brand containing listeriotic bacteria. Hence, this study sought to investigate the knowledge and awareness of food safety in the hospitality industry within the Mhlathuze municipality, KwaZulu-Natal which will encourage the hospitality industry to address the food safety and hygiene practices in order to prevent or reduce the occurrences of food borne diseases within the hospitality industry.

Objective: To determine the food safety knowledge and awareness and measures that are in place in the hotels and restaurants of Mhlathuze municipality, KwaZulu-Natal to prevent foodborne diseases.

Methodology
The research design for the study is cross sectional quantitative in nature designed to assess food safety practices in the hospitality industry as means to fight food borne illnesses. A combination of purposeful and stratified sampling method are used to sample hospitality sectors operators (hotels, restaurants, fast food independents, fast food chains and national parks/resorts, lodges and guesthouse). Data for the study is collected from sample consisting of 50 total number of hospitality establishments: fine dining restaurants (10), fast-food/take-out establishments (10), Hotel (10), guest house (B&B) (20) accessing information from food managers, food handlers and consumers to assess food safety practices and related information. The questionnaires are used as data collection instrument. The questionnaire responses will be coded and analysed using the Statistical Package for Social Sciences (SPSS). Descriptive statistics, ANOVA and regression analysis will be applied to food safety knowledge and awareness variables such as kitchen practices and personal hygiene, cross contamination, time and temperature control. Pearson’s chi-square tests will also be performed to examine if there are any significant relationships between demographics, food safety training, food safety knowledge, awareness, time and temperature control, cross contamination, kitchen hygiene and personal hygiene as well as the food safety practices. Statistical significance would be set at p < 0.05. Further data analysis will be explored using various tables, chart and curves such as the frequency distribution, pie chart and histogram analysis.
References
[Accessed 9 June 2018].
COMMUNICABLE DISEASES COMMUNIQUE (2017). Enteric diseases: District and Provincial diseases, vol. 16,
MOFFAT, C., MUSTO, J., PINGAULT, N., MULLER, M., STAFFORD, R., GREGORY, J., POLKINGHORNE, B. and KIRK,
M. (2016). Salmonella typhimurium and outbreaks of egg associated diseases in Austria, 2001-2011, vol. 10,
no. 4. pp. 1-7.
reported to the outbreak response unit, 2013 – 2017, Public Health Surveillance Bulletin, 16:1- April 2018
WORLD HEALTH ORGANISATION (2015). Non communicable diseases, fact sheet. Available at:

1987 The implementation of the national diploma in Tourism and Hospitality
Management curriculum at two polytechnics, a case study of two polytechnic colleges in
Zimbabwe (STUDENT PAPER)

Ms K. Ngwenya, Fort Hare University
ngwenyakhanyisani@gmail.com

Key words
Technical, vocational, education

Introduction, problem and objectives of research
This study focusses on the implementation of the National Diploma in Tourism and Hospitality
Management (NDTHM) curriculum at two polytechnic colleges in Zimbabwe (Gweru and
Bulawayo cities). There is strong evidence that a poorly skilled population contributes to high
unemployment, especially among the youth, and is a major cause of poverty, and civil and
political instability (UNESCO, 2014). The purpose of the study is to examine how the National
Diploma Three (ND3) in Tourism and Hospitality Management (THM) curriculum is
implemented at the two selected polytechnic colleges.

Problem: Zimbabwe’s tourism and hospitality industry is one of the country’s leading
employers and plays a key role in the economic growth in the country, with its contribution
to the national GDP estimated to be as high as 10% (Turner & Freiermuth, 2017). Zimbabwe
has also established several polytechnic colleges where programmes such as THM are offered
as a way of empowering youth. However, in Zimbabwe as in many other countries, there is
 growing concern over the rate of youth unemployment due to the quality of TVET graduates
(Nhuta et al., 2015) including THM graduates, especially over their lack of necessary hard and
soft competencies to support their respective industries (Mazani, 2015). According to
Zimbabwe’s THM curriculum, on graduation students should either become
managers/supervisors in hotels, lodges or entrepreneurs in the tourism and hospitality sector.
Among other competencies gained (MHTE-STD, 2017). In many instances graduates fail to achieve quality career path (Woyo, 2014).

While numerous studies have been conducted on the challenges facing the TVET which includes tourism sector, for example the Nziramasanga Commission (1999), Chikova (2016), Perman and Mikinac (2014), Mukolwe and Cheloti (2016), and Audu et al., (2016), only a few of these have been conducted in Zimbabwe, and fewer still have specifically focused on THM training. As a result, there is little information available on the implementation of the THM curriculum at polytechnic colleges in Zimbabwe.

**Main Objective**: To assess the implementation of the National Diploma Three (ND3) in Tourism and Hospitality Management (THM) curriculum at two selected polytechnic colleges in Zimbabwe

**Sub-objectives**

1. To evaluate the views and experiences of lecturers and students on the implementation of the ND3 in THM curriculum at the two selected polytechnic colleges.

2. To identify the pedagogical strategies used by lecturers at the two selected polytechnic colleges and the reasons for their use when implementing the ND3 in THM curriculum.

3. To find out how the implementation of the ND3 in THM curriculum at the two selected polytechnic colleges is supported and monitored.

4. To identify the challenges faced by lecturers in the implementation of the ND3 in THM curriculum at the two selected polytechnic colleges.

5. To design a model which can be used to improve the implementation of the ND3 THM curriculum.

**Theoretical framework**: Premised on Rogan and Grayson (2003) curriculum implementation framework. The Rogan and Grayson curriculum implementation framework of 2003 was originally designed specifically for Science Education in developing countries. Its thrust was on the implementation of curriculum in well-resourced schools, although many researchers have applied it on other fields of study such as Geography (Whalley, Saunders, Lewis, Buenemann, 2011), Applied Art (Irivwieri, 2009) as well as Clothing and Textile Technology (Muzenda & Duku, 2014). This study has also adopted it for the assessment of the National Diploma Three (ND3) in Tourism and Hospitality curriculum because of its flexibility and applicability.

**Methodology**

This study shall employ a qualitative approach to research. Saunders, Lewis and Thornhill (2009) profile that qualitative (deductive) research is the kind of research that does not set out to find data to approve or disapprove a hypothesis which was there prior to the study. Qualitative research does not involve any statistical procedures or other means of quantification (Creswell, 2011). Creswell (2014) contends that qualitative research is most useful in answering questions as to what, why, and how certain events occur in order to generate answers. This research approach will enable me to make use of a variety of research methods such as interviews and questionnaires in order to come up with narrative answers to the study’s research questions. In addition a qualitative research approach will allow me
to interact with study participants in their natural setting in order to generate in-depth information (Kumar, 2011) on the implementation of the THM curriculum. Data collected will be subdivided into segments to allow for in-depth analysis of related themes. Findings from this analysis will be compared with results of other studies previously conducted to generate adequate conclusion and recommendations for this study.

References

1995 A case study of a school-based nutrition education programme: A behavioural framework of learners’ perceptions and its influence on food choice (STUDENT PAPER)

Ms L.R. Matshego-Roda, Prof E.L. Kempen & Dr L. Christie, Unisa

Leboroda1@gmail.com

Key words
Childhood obesity, food choices, eating behaviour, perceptions

Introduction, problem and objective of the research
Childhood overweight and obesity crisis continue to increase globally. In South Africa, reports show that urban school-girls and pre-school children younger than 5 years old are more affected. Therefore, the persistence of overweight and obesity among South African children and adolescents highlights an urgent need for effective comprehensive interventions to halt or potentially reverse the epidemic. Schools are recognized as an ideal platform to support
the wellbeing of children (Rathi et al., 2018) as the schools reach children at an age when food habits are being formed (FAO, 2005; Kupolati et al., 2015). School based nutrition education (SBNE) is reported to be critical to the development of healthy eating habits (Rathi et al., 2018).

**Objective**

The objective of this study is to develop a framework that highlights areas of influence on learner food choice practice in order to strengthen SBNE to improve food choice behaviour practice among learners.

**A proposed conceptual framework:**

A framework is proposed which has identified multiple interacting factors including social factors, micro environmental factors and macro environmental factors that have been shown to influence individual's food choices (Patric & Nicklas, 2005; Fitzgerald et al., 2010; Hawkes et al., 2015) which is the learner, in the case of this study based on the Social Cognitive Theory (SCT) model. Additionally, the component of health perception which are based on Health Belief Model (HBM) including threat perception, barrier and benefit perceptions, self-efficacy perception and cues to action that have been reported to influence behaviour. The elements of the SCT model have been added since the HBM does not address an individual perception on health. The framework helps provide an understanding of the interrelated influences of the individual factors, social factors, macro-environment, micro environment, motivation and self-efficacy and the overall perception elements aligned to the HBM on the food choices the learner makes and how the ultimate eating behaviour of the learner is influenced. Perception has been reported to influence food choice (Furst et al., 1996). Therefore, in the case of the learner, it suggests that the learner may engage in health-related behaviour if he or she perceives that there is a threat to his or her health and there is a benefit if action is taken.

The framework explores perceptions in terms of threat perception, benefits perception and barriers perception as these are the key components of HBM predicting individual behaviour of learners in this case. In addition, the following elements will be presented to highlight the interrelation and ultimately influence food choice behaviour of the learner.

**Cues to Action** component in the framework is discussed in terms of the four elements namely nutrition education, modelling, self-regulation skills. Self-regulation can be defined as the act of managing thoughts and feelings to enable goal-directed actions (Murray & Rosanbalm, 2017) and encompasses management of behaviour, attention and environment in the pursuit of personal goals (Kliemann et al., 2016). Nutrition education as suggested can be considered a cue to action as by definition it is any combination of educational strategies, accompanied by environmental supports designed to facilitate and model the adoption of food choices and other food and nutrition-related behaviours conducive to health and wellbeing (Contento, 2011).

**Motivation** refers to reasons that underlie behaviour (Guay et al., 2010) which can be intrinsically motivated or extrinsically motivated (Pintrich, 2003; Guay et al., 2010). The framework argues that if the learner have the belief that they are capable of performing the behaviour and have the ability to control her behaviour and set goals and can see the benefit he or she is likely she will be motivated to retain it and perform the observed behaviour (Contento, 2007). Thus, the motivation is regarded as a precursor factor influencing self-efficacy (De Vries, 2017) which enhance the confidence of the learner.
Self-efficacy has played an important role in predicting nutrition behaviour according to Deshpande (et al., 2009) as it is believed to be the most important characteristic that determines the persons belief in ones capability to successfully perform behaviour (Glanz et al., 2015) particularly when there is a perception of threat or for coping in a threatening situations (Bandura, 1997) which can be a threat of a disease such as obesity. Therefore, this suggests that the learner with high level of confidence or the feeling of capability is more likely to feel motivated to choose healthy food items than the learner with lower levels of self-efficacy.

Methodology

Only about the proposed framework will be presented, with the intention to gain comments and adjust appropriately where necessary in order to refine the appropriate methodology.

References


Contento I.R. Nutrition education, linking research, theory and practice. 2nd ed. Sudbury, Mass: Jones and Bartlett; 2011


175
9. POSTER PRESENTATIONS

1905 Preference for hospitality study among TVET College graduates in Pretoria, South Africa (POSTER)

Dr N.O. Mafa – Theledi, Dr M.M. Olowoyo & Prof S. Maile, Tshwane University of Technology
LebeloON@tut.ac.za

Key words
Choice, parents, information, government and education

Introduction
Vocational colleges are established with the aim of reducing unemployment rate among the youth. However, the hospitality industry has been labelled as a labour intensive industry and is heavily reliant on availability of skilled labour to function effectively. The present study explored the reason and preference for hospitality as a course over other courses that are offered at the TVET colleges.

Methodology
A mixed method approach was used to carry out the study. An open ended questionnaire was used and sought to provide reasons for their preference for hospitality course, job satisfaction and job retention among others. Preferred aspect of hospitality course also documented. Descriptive method was used to present the result and followed by the use of ANOVA (Analysis of Variance). A total of seventy – five TVET hospitality graduates were interviewed and the result was subjected to statistical analysis.

Results
The study showed that only 55% of the participants reported that hospitality study was their first choice and were motivated because of their love and passion for cooking. The remaining participants mentioned that boredom, willingness to get out of home, pressure from parents and that support from the government through payment of fees forced them to register for the hospitality study. Pressure to study hospitality were mostly from mothers and not fathers. 52% of the participant believed that they may get a satisfying life within the hospitality industry. 92% of the participant believed at the high school level that hospitality study is all about working as a chef and characterised with low pay. Those that have been working in the industry for more than 5 years mentioned that they will prefer to remain in the industry while majority of those who have worked for two years or less mentioned that they are not willing to stay in the industry. The most preferred aspect of the hospitality work by 80% of those interviewed was working as a chef. 75% agreed that working as a waiter is too demanding and characterized with low pay. Lack of information on the role of hospitality industry, low
wage and working hours are some factors that were reported to affect their choice for hospitality study.

**Conclusion and Recommendation**

The study concluded that information on the importance of hospitality study should be provided at the high school level and students should be allowed to choose a course they love as this may affect their performance at workplace as noted in the present study.

**References**

- [1907 A literature review in design education: Implications for the Consumer Studies curriculum (POSTER)](mailto:Ms C Swana, Nelson Mandela University

cwayitas@nmmu.ac.za

**Key words**

Consumer Studies Curriculum; Design education; Grade 11

**Introduction**

Consumer Studies teaches learners about responsible and informed consumer behaviour in respect of food, clothing, housing, furnishings and household equipment. Among others, Design elements and principles are taught as a theoretical component of the subject. Under this topic Grade 11 learners, specifically, are taught technical aspects such as line, form, space, colour combinations, texture, proportion, balance, rhythm and harmony. This can be considered to be the learners’ introduction to design education. While the technical aspects of design need to be taught, they are only the tools that are used to create designs. It may be problematic to introduce learners to the tools of a discipline without first establishing the greater role that that discipline plays in society.

This paper argues that fundamentally learners should be taught the rationale for the design discipline seeing that it influences multiple facets of consumer behaviour. A multidisciplinary design network between graphic design, product/industrial design, interior design, experience design, UX/UI design and fashion design, among others, influence consumers’ decisions on a daily basis. Designers play a role in creating the environment in which consumers make day to day decisions. Because of this, the design discipline has a responsibility to produce creative outputs that enhances peoples’ lives. This paper proposes that it is this responsibility that learners need to be sensitised towards. Arguably, some of the challenges in consumer behaviour are created by designers that lack this understanding. Learners then, as future designers of consumer experiences, may benefit from knowing this early. Teaching this responsibility in Grade 11 is also important because in matric learners apply to study further in tertiary institutions. Their interest in and attitude towards the field
of design may be determined by how they were introduced to it. Recent studies in design highlight that the complex challenges that are faced globally require designers that are equipped to tackle them and there are debates regarding how design education can arise to this task.

This paper will draw from recent literature in design education to suggest possible teaching directions for the Consumer Studies subject in introducing design to high school learners. Theoretical as well as practical recommendations for the topic will be made. The arguments in this paper will stem mainly from a graphic design perspective because that is the author's field of expertise. However, since graphic design does not exist in isolation, some perspectives from related fields will also be discussed.

**Methodology**

This study will review literature in design education that reports on the current and future needs of the graphic design profession and learners’ preparedness for it. Only peer-reviewed and DHET accredited journals will be included in this review. Search terms such as “design education”, “designing the future”, “social responsible design” will be used. The articles that the search yields will be analysed for topical themes that will be discussed. Additionally, articles from authorities in the design industry will be consulted as they provide guidance from a professional perspective. Such authorities include AIGA, which is the design industry’s oldest and largest professional membership organisation.

**References**


---

1919 The influence of information acquisition and knowledge on consumers’ behaviour towards infant vaccinations (POSTER)

*Ms S. Dennis, Ms E. Botha & Ms H. Dreyer, North-West University*

*shannidns@gmail.com*

**Key words**

Infant vaccinations, consumer behavior, consumer decision-making, knowledge, information acquisition

**Introduction**

Global statistics show that vaccine-preventable diseases cause an estimated 1.5 million morbidities and mortalities in children under the age of five years annually (WHO, 2018), compromising sustainable communities. Vaccinations are considered one of the most cost-effective health interventions (Fadel et al., 2017:136; Odone et al., 2015:73), nonetheless, there are still children who remain unvaccinated or only partially vaccinated (Fadel et al., 2017:136; Odone et al., 2015:73).
Between 2015 to 2017 the Dr K Kaunda district had a 15.4% decline in immunisation coverage of children younger than one year (Aung & Dlamini, 2017:119). The Dr K Kaunda district had the largest decline of all the districts in the North West province. Potchefstroom is situated in the Dr K Kaunda district, and is therefore at risk for vaccine preventable disease outbreaks as a result of low vaccination coverage. Due to misinformation which is readily available (Madathil et al., 2015:191), caregivers might not be able to make informed decisions regarding their infant vaccination behaviour. Therefore, the influence of consumers’ information acquisition and knowledge on infant vaccination behaviour were investigated. Thus, this study aimed to investigate the influence of consumers’ infant vaccination information acquisition and knowledge on their infant vaccination decisions.

**Methodology**

The study was a quantitative, cross-sectional and descriptive survey design. Quantitative data was gathered by using an electronic survey, in order to describe and investigate infant vaccination behaviour. The survey was set up in QuestionPro and was available in Afrikaans, English and Setswana. StatsSA (2011) indicated that 71.4% of residents in Potchefstroom speak Afrikaans, 7.6% speak English, and 11% speak Setswana. The study aimed to collect 300 completed questionnaires. Data collection took place at day-care centres and at the Potchefstroom Post Office. Respondents were made aware via advertisements of the study one month prior to data collection.

**Day-care centres:** Advertisements were distributed to the caregivers who had infants at day-care centres. Willing respondents provided their e-mail addresses. The link to the survey was sent to respondents.

**Post offices:** Advertisements were placed on the notice board at the Potchefstroom Post Office to make respondents, who were the caregivers of infants 0-23 months old, aware of the study which took place. Data collection took place on the last day of the month, when individuals visited the Post Office to collect child grants. Respondents were given the opportunity to complete the questionnaire on a provided electronic device on site or by providing their e-mail addresses. The link to the survey was sent to respondents and they were given the opportunity to complete the survey on their own time.

**Data analyses:** The Statistical Package for the Social Sciences (SPSS) Version 24 software was used to analyse data. Descriptive statistics and frequency analysis was used as part of the data analysis. Tables and graphs ensured that the results were easily understood. Descriptive statistics more specifically, means and standard deviations, were also used to analyse the data. Furthermore, factor analyses was also used to determine construct validity, and comparative analyses included crosstabs, independent t-tests, and ANOVAS.

**Results**

Data should still be gathered for this study, however, data collection should be completed and analysed before the conference. A statistician employed by the North-West University will assist with data analyses. Thus, the study will have results to report before the conference takes place.
Conclusions and Recommendations

Conclusions cannot be made yet, since data collection should still take place. However, this study can make a valuable contribution to the Consumer Science discipline by researching a topic, which has been under investigated in South Africa. The research will also provide insight into aspects, which may influence consumers’ infant vaccination behaviour in the South African context. Findings of this study could be useful to healthcare providers and other role players as it can assist with the improvement of communication strategies which aimed to educate consumers about infant vaccinations and improving infant vaccination coverage. Improved communication and education on infant vaccination will contribute to more sustainable communities through fewer outbreaks of vaccine preventable diseases.

References


1920 Association between anaemia status; anthropometric status and feeding practices in 6-12 months infants living in HIV exposed environment (RETRACTED)

Ms P. Mamphwe, Dr A.M.P. Hoffman & Prof U. Feucht, University of Pretoria

phumumamphwe@gmail.com

Key words

Anaemia, anthropometric status, feeding practices, infants, mother and HIV

Introduction, problem and objectives of the research

Children under 12 months are at higher risk of undernutrition due to rapid growth and development. One of the main determinants of child undernutrition is the Human Immunodeficiency Virus (HIV) in Africa. The prevalence of HIV is high in children with Severe Acute Malnutrition (SAM) and these children are at a greater risk of under-five mortality in the Sub-Saharan Africa (SSA) regions. A South African cohort study pointed out that stunting is a major problem in children under-five living with HIV4. More children in the SSA regions were newly transmitted with HIV through vertical transmission during pregnancy, delivery
and breastfeeding. Children under 12 months are amongst the vulnerable group as they can acquire HIV when their mothers are pregnant and also through breastfeeding. South Africa is one of the countries that has the highest number of children born to women living with HIV, but the children are not living with HIV but only exposed to it (3.2 million children). These children are referred to as children who are HIV exposed uninfected (CHEU). CHEU are more vulnerable to infections that are severe and the risk of dying in these children is two times higher in the first year of life compared to children who are HIV unexposed and uninfected (CHUU). Limited literature on growth and development is seen in this group as more studies focused on mortality.

Problem statement
Growth faltering may be observed in infants if complementary foods are not introduced around the age of 6 months, or if they are given inappropriately to infants. The ages between 6-12 months is vulnerable to growth faltering, micronutrient deficiencies and infectious illnesses. Anaemia and growth retardation are common manifestations infants born to mothers living with and without HIV which then leads to suboptimal outcomes. Anaemia is the most common nutritional deficiencies among children especially in Low and Middle Income Countries (LMICs). The South African childhood review revealed that about 11% of children under five are anaemic. One in five children in the country is anaemic, one in fifteen is moderately anaemic and one in five hundred is severely anaemic. Children in the 6-23 month age group are the most severely affected in South Africa. It is widely accepted that anaemia can have long-term consequences which may become irreversible.

Aim and objectives
The aim of the study is to determine the associations between anemia status in relation to, anthropometric status, and feeding practices in 6-12 months infants living in a HIV exposed environment.
1. To determine the prevalence of anaemia using Hb values of mother-infant pair
2. To determine the association between anaemia status and anthropometric status of the mother-infant pair
3. To determine the association between anaemia status and feeding practices using WHO questionnaires
4. To determine the nutrient intake of 6-12 months infants living in a HIV exposed environment.

Methodology
A quantitative research method and prospective longitudinal descriptive cohort study will be used. Stratified random sampling will be used to ensure that different groups (age, gender and demographic) within the target population are recruited on purpose to become part of the sample. Only mother-infant pair with complete data on anthropometric status, feeding practices and Hb values determined will form part of this study. Anthropometric status of
mothers will be determined using body mass index (BMI), mid-upper-arm circumference (MUAC) and body fat%. Feeding practices of infants will be determined by interviewing other using the World Health Organization infant’s questionnaires, including breastfeeding information and complementary feeding. Furthermore dietary intake information will be collected using a single 24 hour recall and one weekly-day-day variations food frequency questionnaires (FFQ) from mothers of 6-12 months infants. For infants MUAC, head circumference, weight for age, length for age and weight for length will be used. Anaemia status will be determined by Hb values <11g/dL as anaemic and non-anaemic with Hb values >11g/dL for infants. Further analysis will be done on infants who are described as anaemic. Data will be analysed using SPSS version 25. Linear regression model for the longitudinal data point (at birth, 6, 9 and 12 months), ANOVA to determine the associations between groups.
References

1931 Exploring water usage habits and practices of kitchen staff in the Vaal region

(POSTER) (RETRACTED)

Ms E. Van der Merwe, Prof E.G. Dicks & Dr D. Oosthuizen, Vaal University of Technology
etresiavandermerwe@ymail.com

Key words
Water, water usage habits, water usage practices, water saving, water wastage

Introduction
Water is considered as the most important source of life, and if not conserved may become scarce even in areas where water is freely available (Kasim et al., 2014). In 2016, South Africa
had faced one of the biggest droughts in 23 years, and water shortage could become critical by 2035 if water saving practices are not implemented. Water resources is further compromised by the low rainfall in the country (Chernick, 2016). Rapid growth within the hospitality and tourism industry leads to high demands and usage of water, especially amongst restaurants. Restaurants produce vast amounts of grey water which further compromises the environment, and adds to water wastage (Tauranga City, 2011; USEPA, 2012; Wang et al., 2013; Barnstable Country Department of Health and Environment, 2016). Although industry recommendations exist on water saving techniques, which may be applied in restaurants, little is known about the actual practices and habits of staff on water usage in restaurants. Therefore, the objective of this study was to explore water usage practices and habits of kitchen staff in restaurants to identify if water management techniques were present.

Methodology
A qualitative observational design was used during this research study. Ethical clearance was obtained from the Vaal University of Technology before fieldwork commenced. After identifying restaurants in the Vaal Region (Vanderbijlpark, Vereeniging and Sasolburg), restaurant owners and managers were approached to participate in this study. Once consent was obtained the observations commenced. The non-probability convenience sampling technique was used until data saturation was reached. During observations, field notes were taken during the busiest shifts, as determined by the restaurant owners and managers. Observations was done in such a manner that staff members were not aware of what is being observed, to ensure a naturalistic environment. Thereafter, the data was transcribed and coded, whereby concepts, categories and themes were identified and managed by means of AtlasTI.

Results
The results revealed that water wastage was occurring more frequently during practices and habits such as rinsing activities and water disposal. as the main contributors. Rinsing activities contributed to wastage through improper tap use such as leaving the tap running, not properly closing the tap or opening the tap numerous times during this kitchen activity. Disposal of water occurred in drains and gullies and was not reused in any form. Results however also indicated some water saving practices and habits. Water saving practices and habits included using water readily available in activities such as rinsing, waterless procedures during cleaning, re-using of water, tapered water use and water use during cleaning procedures. Some of these water saving techniques included the restriction of water, awareness of water usage and using other methods during kitchen activities to execute the task with limited or no water being used in order to contribute to water conservation. Water saving habits and practises happened less frequently than water wastage.

Conclusions and Recommendations
Although industry recommendations on water usage exist with the aim on saving water, the practices and habits are not always consistent to the mindset of kitchen staff. Furthermore, there is also limited amount of information regarding the quantity of water wasted in restaurant kitchens. It is therefore recommended that further investigation be done on the
quantity of water wasted as well as the link between awareness and information displayed and how it impacts the use of water. Training programs should also be implemented in restaurant kitchens in order to educate staff members on the importance of water saving and conservation.

References

1932 Analysis of the amounts of tomato inclusions in South African mixed dishes as a contribution towards a vegetable serving (POSTER)

Ms R. Hanekom, Cape Peninsula University of Technology 
HanekomR@cput.ac.za

Key words
Cardiovascular disease; lycopene; mixed dishes; phytochemicals; tomato; tomato products

Introduction
A plant-based diet is increasingly promoted to support health and reduce chronic disease risk (Kim et al., 2019:1), and more recently a contributory saviour of the environment (Lynch et al., 2018:1). Lycopene has been studied in relation to associated risk reduction for certain types of cardiovascular disease (CVD) (Story et al., 2010) and prostate cancer (Giovannucci et al., 2002:1). In support of the above, health authorities widely advise on adequate intake of vegetables and fruit. Tools used to inform consumers include the ‘five-a-day’ health campaign (WHO, 2018), and country-specific food-based dietary guidelines across the world, including South Africa, with the dietary guideline “eat plenty of vegetables and fruit every day” (Naude, 2013:S46).

The South African population is nevertheless not consuming an adequate daily intake (400 g) of vegetables and fruit (Naude, 2013:1). One way to increase the intake of vegetables is to consume vegetables as part of mixed dishes where it may be found to be a more acceptable way of consumption than eaten singly on its own (Branum & Rossen, 2014:2053). Although it
may be more realistic to consume vegetables as is, rather than to incorporate them into dishes, adding a variety of vegetables to mixed dishes such as soups, stews and casseroles in quantities that can contribute to the consumption of a vegetable serving is a prospect to enhance vegetable intake (Mager & Venter, 2015:33).

Tomatoes may be the vegetable to enhance the increased vegetable intake as it is the vegetable consumed in the largest quantities around the world (Freeman & Reimers, 2010), as well as SA (Department of Agriculture, Forestry and Fisheries, 2017:5). In a recently conducted South African study (Mager & Venter, 2015:42) to determine the likelihood of consumers in the professional sector in the City of Cape Town to consume various vegetables, tomato was noted a likely vegetable addition. The North/South Ireland Food Consumption Survey undertaken by O’Brien et al. (2003:712) found mixed dishes to contribute to the mean daily intake of specifically tomatoes. The objective of this study was to determine if the tomato inclusions per portion in general South African mixed dishes is sufficiently high to contribute to a vegetable serving (80 g) as recommended by the WHO.

Methodology

The sampling method for this study was purposive and convenient. The study population comprised of six recipe books that were identified as top sellers by an established book retailer in the Northern Suburbs of the Western Cape, based on sales figures of 2017. The selection excluded recipe books aimed at specific dietary requirements or choices.

The extracted mixed dish recipes including tomato or tomato products were grouped into eight food categories; namely meat, chicken, fish, vegetarian, pasta/rice, soups, salads and sauces. The identified tomato or tomato products were further categorised; namely raw/cooked, canned, purée, paste, sauce, juice, soup and dried.

Descriptive statistics were used to obtain the amounts of tomato inclusions per portion per food category and tomato type. The results were compared to the suggested vegetable serving size per tomato type as recommended by the United States Department of Agriculture (USDA) Nutrient Database for Standard Reference (USDA, 2009).

Results

The meat category represented the highest (35%) contribution of recipes out of the total (n=250) recipes extracted, followed by the vegetarian category (18%). The meat category included mostly purée (62%), sauce (52%), canned (47%) and paste (44%) of all the tomato and tomato products included as an ingredient. Overall, raw/cooked tomatoes were the type largely included in the mixed dish recipes (56%).

For raw/cooked tomatoes, the contribution to a vegetable serving was between half (meat, chicken, fish, vegetarian and salad) and one serving (pasta/rice, soups and sauces). For canned tomatoes and paste, the contribution for most food categories was half a serving, with only the soup category reaching a full vegetable serving. For purée and paste, the contribution for most food categories was half a serving or lower. For sauce, half of the food categories reached half a serving. For juice, soup and dried tomato inclusions the contribution towards a vegetable serving was zero for five of the eight food categories. The soup category contributed to a vegetable portion in three of the tomato product type categories, namely
raw, canned and paste. The meat, chicken, fish, vegetarian, salads and sauces categories only contributed between half or a third of a vegetable serving.

**Conclusions and Recommendations**

The tomato and tomato product inclusions per food category per portion of the South African mixed dishes considered, largely failed to contribute to a vegetable serving. The study did not profile the dishes typically consumed by a defined population. The focus was to rather identify if tomato inclusions in general South African recipe formulations are sufficiently high to contribute to a vegetable serving.

If the tomato inclusion per portion across the prepared food categories do not contribute to a vegetable serving it may provide an incentive to recipe developers to make a concerted effort to maximise vegetable inclusions in dishes to attain a vegetable serving through such consumption as it considers meeting consumer demands on cost, convenience, availability and taste variety of culturally diverse dishes.

**References**


Department of Agriculture Forestry and Fisheries. 2014. Production guidelines for tomatoes.


Mager, S. & Venter, I. 2015. Food additions that consumers in the professional sector in the city of Cape Town are likely to consumer to enhance their phytochemical intake. Journal of Consumer Science, 43:33-49.


Key words
Ethnic food, behaviour, culture, risk, acceptance, consumer

Introduction
South Africa is one of the most culturally diverse countries (Brewer, 2014), influenced by many foreign cultures. This foreign influence has been mixed with the local food, resulting in a rich and unique cuisine (e.g. Dutch, Indian, British, Sotho, Nguni) (Oktay & Sadıkoğlu, 2018) however a celebration and promotion of local cuisine is sorely missing in South Africa (SA) (Teagle, 2018). As the patterns of daily life in SA are conditioned by social class, ethnicity, religion and residence, role players need to articulate and define what South African cuisine is to consumers. As the country often struggles to expand the economy in order to provide equally for all citizens, great disparities continue to exist, yet, all citizens are likely to enjoy much the same pleasures: the company of family and friends, local films, music and dance, and visits to national parks and scenic landscapes (Lowe et al., 2019). In SA the concept of Ubuntu is taken very seriously amongst the people. It is viewed as the connection existing between people and their surroundings, meaning that family is very important to South Africans (Makgoro, 2009).

Food-related consumer behaviours are transformed and influenced by various factors that can be categorized as food-internal factors (e.g., food neophobia) and food-external factors (e.g., information and social factors) (Eertmans et al., 2001; Jang & Kim, 2015). There is a growing interest in studies about consumers’ perception towards novel or unfamiliar food, and it gives rise to studies on behavioural concepts such as food neophobia and food consumption intention (Zielinska, 2006; Ting et al., 2016).

Today’s consumers crave more variety in their food consumption experiences due to the influence of: ethnic diversity, globally sourced food, cultural experiences, and media exposure (Verbeke & López, 2005; Jang & Kim, 2015). Ethnic foods are defined as foods originating from a heritage and culture of an ethnic group who use their knowledge of local ingredients of plants and/or animal sources (Kwon, 2015). Ethnic foods is the perfect medium for strengthening ethnic identity and country heritage because food tastes can be acquired and transmitted more easily than other types of cultural products such as language and belief systems (Van Esterik, 1982; Ting et al., 2017). Therefore, the purpose of this poster is to develop and justify a conceptual framework for discussing the influence of ethnic food on the behaviour and culture of the South African society.
Methodology

This poster provides a conceptual framework (Rocco & Plakhotnik, 2009) primarily concerned with ethnic food behaviour. The framework focuses on specific constructs that influence the perceived risk (e.g. food neophobia) and acceptance (e.g. cultural familiarity, receiving information) of ethnic foods. In addition, suggestions are provided to strengthen ethnic diversity and cultural experiences.

Results

In order to strengthen the interpersonal relationship, ethnic identity and country heritage in SA and to understand the influence of ethnic food on the behaviour and culture of consumers, the authors suggest, it is important to: 1) know the different constructs of ethnic identity; 2) know the factors that influence South African cuisine; 3) know the social functions of food; 4) research ethnic food behaviour; 5) expose consumers more to different cultures to promote ethnic foods; 6) implement the marketing of learned safety; 7) decrease food neophobia; and 8) increase cultural familiarity, receiving information and the willingness to try new ethnic foods.

Conclusions and Recommendations

Considering that Ubuntu is an important principle in SA, being described as “the connection existing between people and their surroundings”, more research is necessary to understand the influence of ethnic food on the behaviour and culture of our society. By increasing cultural familiarity and more exposure to ethnic food will hopefully create more unity, allowing for inclusivity and unity of South African cultures. Through the consumers’ willingness to learn more about other cultures, a new culture will eventually start to develop, forming part of the South African heritage. Understanding ethnic food behaviour will help to break cultural stereotypes and reflect true South African diversity both through the people visiting and the food they choose.

References

1957 Effects of maturity on antioxidants content of watermelon juice at different maturity stages (POSTER)

Ms M.M. Maoto, Dr D. Beswa & Prof A. Jideani, Unisa
maotomm@unisa.ac.za

Key words
Consumption, human-health watermelon juice, antioxidants, maturity

Introduction
There is an increase in consumption of natural fruit juice as an alternative to the traditional caffeine-containing beverages such as coffee, tea or carbonated soft drink. This may be attributed to consumer consciousness about the beneficial contribution of food to their health. Watermelon (Citrullus lanatus) is a nutritional beverage containing essential minerals and amino acids. In addition; it contains lycopene, ascorbic acid, β-carotene and polyphenols as antioxidants against inflammation, and certain cancers. Therefore, the dietary intake of watermelon juice can significantly improve human health and well-being. It can result in the reduction or prevention of chronic diseases such as cardiovascular diseases, various cancers, diabetes and hypertension. However, the antioxidants content of watermelon juice is affected during the maturation stages as it undergoes some chemical changes. As a result, monitoring these quality properties during maturity is becoming very important since the state of maturity during harvest, storage and market distribution determines the quality of the product that meets the customer’s satisfaction. The aim of this study was to investigate the changes in major antioxidants of commercial watermelon (Sugar baby) cultivar grown in an open-field and harvested at three different stages (unripe, half-ripe and fully-ripe). It was hypothesised that stages of maturity affects the antioxidants properties of watermelon fruit juice. The watermelon fruits were cut into slices; the rind and the seeds were separated from the flesh.

Methodology
Three (3) watermelon per row were manually and randomly picked at different stages of maturity (unripe, half-ripe and fully ripe stage). The stages of maturity were determined according to the number of days of planting (60 days after planting recorded as unripe, 73
days after planting is recorded as half-ripe and 90 days after planting recorded as fully-ripe sample. The flesh was put in the table juice extractor (Russell Hobbs Juice Sensation Model no: RHJM01. 220-240 V - 700 W, UK) to extract the watermelon fruit juice and packaged in 50 ml polyethylene bottles. The analysis of the antioxidants (lycopene, β-carotene, ascorbic acid and total polyphenolic content) were done using the HPLC with NH2 Spherisorb. A carotenoid C30 reversed-phase column (250×4.6 id, 3 μm) with a UV detector at absorbance 450 nm for β-carotene and 475 nm for lycopene 254 nm for ascorbic acid (Model RD-20A, Japan). The absorbance of supernatant for total polyphenolic acid was measured at 750 nm using a UV-VIS spectrophotometer (ThermoFinnigan/ FinniganMAT, San Jose, CA, Bremen, Germany).

Results

At the unripe stage, the lycopene content was 0.04 mg/100 g but increased as maturity progressed, a significant (p < 0.05) increase in lycopene content was observed until it reached 6.19 mg/100 g at fully-ripe stage. No β-carotene was detected at the unripe stage; however, a significant increase (p < 0.05) was observed as maturity transitioned to half-ripe (0.12 mg/100 g) and reached 0.23 mg/100 g at fully-ripe stage. A similar trend was observed for ascorbic acid, it was 1.3 mg/100 g at unripe stage but significantly (p < 0.05) increased with maturity until it reached 3.47 mg/100 g at fully-ripe stage. A significant increase (p < 0.05) in total polyphenolic content was also observed. It was 4.87 mgGAE/100 at unripe stage and it reached 25.95 mgGAE/100 at fully-ripe stage.

Conclusions and Recommendations

It appears that maturity does not have a negative effect on quality parameters of the watermelon juice. The increase in antioxidants during maturity may be attributed to progressive activation of the molecular mechanisms involved in carotenogenesis regulation during the transition and also due to the decrease of chlorophyll. Ethylene and enzyme activity might be playing a role in fruit maturity of cultivated watermelon. The results of this study suggest that consumption of watermelon juice can contribute significantly towards human health due to the amount of antioxidants at ripe stage. Furthermore, the presence of these antioxidants enhances its potential use as a functional ingredient in food application.

References
1976 Documenting and contextualising Maasai dressing styles for fashion design purposes

(posters)

Ms K. Tissiman, Prof A. Mastamet-Mason & Ms M. Cheruiyot, Tshwane University of Technology
mullerk@tut.ac.za

Key words
Dressing styles, Maasai, material culture, East African culture

Introduction

In this study the researcher aims to contextualise the material culture of the Maasai tribe of Kenya and Tanzania. By doing this the researcher hopes to further the little knowledge known about the Maasai material culture.

Material culture refers to certain groups of people’s historical and current physical objects, resources, and spaces that they use to define their culture and beliefs (Houghton Mifflin Harcourt, 2013). Physical objects, such as homes, infrastructure, plants, tools, and products, as well as clothing/costumes, artworks, and ornaments, are all aspects of material culture and they define actions and perceptions (Houghton Mifflin Harcourt, 2013). Based on this definition, the Maasai’s dressing styles qualify as part of their material culture since their styles of dressing distinguish them from other East African and other African ethnic groups.

According to Cabral (1993:63), African culture consciousness involves determining a virtuous agenda for preserving and progressing contributions made by the African culture. Both slavery and colonialism undermined the ability of African cultures to develop and progress (Zulu, 1996:65). When considering African colonialism, domination and economic exploitation alongside a political system of control were introduced (Zulu, 1996:65). African culture was viewed as vicious and primitive, leading to Africans running away from their traditions and embracing Western cultures (Rovine, 2009:50-53). According to the National Policy on Culture and Heritage (Republic of Kenya, 2009:15), “[t]he peoples of Kenya have unique cultural innovations resulting from their long-term interaction with their environment and nature. These cultural expressions are threatened with extinction by internal and external influences”. As a result, most of the traditions were discarded during the postcolonial period and no preservation for future referencing by African generations is available. Most documentation available on traditional costumes is often in the form of colourful photographs and illustrations, without much supporting literature explaining the evolution of the traditional dressing styles of any indigenous African people, or the Maasai people as the focus of this study.

Traditional dressing styles provide a means by which to absorb distant cultures, to highlight cultural differences, and often to reinforce cultural identity (Rovine, 2009:45-53). They play an important role in the characterisation of cultures and sub-cultures and provide a means of marking relationships or classifying people according to certain cultures (Rovine, 2009:45-53). Exploring the Maasai dressing styles offer an opportunity to trace, document, and preserve changes that may have taken place between 1945 to date. This period includes the British colonial period in Kenya and the postcolonial period after 1963. As observed during data
collection, most Maasai people have also embraced Western ways of dressing during day-to-day activities and only wear their traditional clothing on special occasions. There is a correlation between nomadism and traditional dressing of the Maasai people. The Maasai have now settled to carry out subsistence farming and the farm activities demand clothing that is more flexible.

Since World War II, the United Nations Educational, Scientific and Cultural Organization (UNESCO) has supported a series of world heritage initiatives, beginning with tangible heritage also known as material culture, both immovable and movable, and expanding to natural inheritance (Seitel, 2001). UNESCO’s effort to establish an instrument for protecting intangible heritage dates back to 1952 (Seitel, 2001). During the 1980s, legal issues were distinguished from preservation measures, and in 1989 the UNESCO General Conference adopted the Recommendation on the Safeguarding of Traditional Culture and Folklore, such as the Maasai dressing styles as their material culture. The emphasis of the conference deliberations urged professionals and researchers to document and preserve the records of endangered traditions to sustain them for future reference. This research heeds UNESCO’s call to preserve a culture that still exists in Africa.

When considering Africa’s wide and rich market for contemporary fashion, it is no wonder that the rest of the world seeks identity and inspiration from its rich cultures (Allman, 2004:189). Africa is well known for its rich and diverse material cultures, which have not been documented exhaustively (Kennett, 1995:85). Textiles and fabrics utilised by African indigenous people, although most often used by Western designers to inspire their creations, have not been documented into the mainstream history of fashion. Considering the Maasai people of Kenya and Tanzania, the Westernisation of cultures and infrastructure around them has not affected them in the way that they have affected other African cultures. Although the reality on the ground indicates otherwise, as discussed above, the purpose of this study was to serve as documenting of history and design inspiration for fashion design disciplines and to ultimately preserve and reinforce the Maasai dressing styles. Preserved material cultures will become future references for fashion designers and African history of fashion/costume

**Methodology**

The study being a material culture, used qualitative research design to analyse visual items, textual documents, available photographs, and interviews to portray the Maasai community with regard to their way or style of dressing. The qualitative research approach was chosen to facilitate a deep understanding of the underlying structures of the Maasai dressing style as an aspect of material culture, specifically the evolution of the materials (fabrics) and ornamentations used between 1945 to date. It also enabled the researcher to understand different dressing styles used by the Maasai people in different events and for different social classes.

The research site or population for the study focused on the Maasai people of Kenya who were considered as the appropriate sample because they have maintained distinctive dressing styles. They are viewed as the “most authentic ethnic tribe” of Kenya, according to Rose (2013). The location chosen for data collection was Narok County, this was because the research assistant of this research study is familiar with the area, as well as the famous tourist attraction the “Maasai Mara” is located there. The researcher felt that the contrast between the tourists view and the view of the Maasai elders will be valuable to the study. While in the
County the population group considered for the study was the Maasai people currently living in Kenya and therefore ensuring authenticity and accuracy during interviews. A snowball sampling method was employed in the selection of the participants, and proved to be immensely favourable, as the target group turned out to be well rounded. The data collection was done using an interview schedule, wherefrom the data gathered were coded and placed into meaningful categories before interpreting and discussing the findings. Photographic and document analyses as secondary data were scrutinised based on the dressing styles as material culture of the Maasai of Kenya. The areas of the Maasai dressing styles that were investigated were:

- clothing and dressing styles,
- colours used; and
- textiles (prints, colours, and textures).

Research permits were obtained from the university hosting the study and in Narok County in Kenya.

Results

The research found that the Maasai have indeed changed their way of dressing over this period. Before 1945, the Maasai wore hides and skins and any other materials available in their environment. The Maasai first changed from their skins and hides in the 1960s, when Arab traders brought with them blankets and traded them for meat and hides. The blankets mostly replaced the animal skins and hides. Then, during the 1970s, Arab traders introduced the Maasai to calico (Jinja), which was plain colourless cloth that was much softer and lighter than the blankets. They chose this over the blankets due to the hot climate of their country and because they allowed flexibility. As discovered by this research, most Maasai have adopted other garments and fabrics such as the Kangas, T-shirts and Shuka. The Maasai have also stopped piercing their ears and employ less decorations, but have introduced contemporary jewellery and textiles suitable for the modern day. The Jinja fabric was soft and light, but uncoloured. They dyed the cloth with their beloved ochre, to provide the rich red colour that they love.

Conclusions and Recommendations

The Maasai have maintained their culture even when faced with 4th industrial revolution era where technology has influenced most traditional production methods. Different dressing styles for different social classes are still maintained, although the original garments are spared for special functions and occasions. Every day clothing has changed tremendously in terms of style, but it maintains the cultural aspects. The garments include sewn skirts and T-shirts presented in the rich Maasai colours that allow flexibility for house chores. Based on the distinctive nature of the Maasai dressing styles, it is suitable as a source of inspiration for contemporary fashion design, as attested by Thakoon, fall ready-to-wear collection, 2011 and Louis Vuitton, spring menswear 2012 collections as well as various projects by students in various institutions, and as historical point of reference in the teaching of history of costumes in fashion design or related fields.
**1990 Consumers’ procedural knowledge of genetically modified (GM) food products and how it may affect the purchasing decision (POSTER)**

*Ms S.C. Van Zuydam, Prof E.L. Kempen & Dr L. Christie, Unisa*

*sone.zuydam1@gmail.com*

**Key words**

Genetically modified (GM) food products; procedural knowledge; purchasing decision; information; sources

**Introduction**

The genetically modified (GM) food industry is growing rapidly (Deng et al. 2019) as the production of GM crops is being adopted by increasingly more countries around the globe (Gouse et al. 2016). One of the major benefits of producing GM food products is to increase food supplies which will aid in preventing food shortages (Cui & Shoemaker 2018). In South Africa, there are various GM food products available in supermarkets such as sugarcane, maize, sugar beet and tomato (Wray 2017). It is, however, not certain what procedural knowledge consumers currently have about GM food products and if their existing knowledge would action them to purchasing GM food products.

Procedural knowledge is a type of knowledge that involves the process in which consumers use their pre-existing knowledge (Saricam & Okur 2019) to perform a specific task (Genc et al. 2019), such as how to select wine to drink with a meal or how to select soup that is low in salt (Worsley 2002). In the case of GM food products, it relates to how to select a GM food product for consumption based on knowledge of genetic modification. Therefore, the already acquired knowledge and information can lead to the formation of opinions, awareness and attitudes (Hoque et al. 2018), which influences consumers’ purchasing decision (Mandal & Paul 2012). This study therefore aimed to identify consumers’ procedural knowledge of GM food products as well as the sources of information from which GM-related information is obtained and to determine if procedural knowledge influences the purchasing decision.
Methodology

This quantitative study was conducted in Mooi River, KwaZulu Natal, South Africa in which an exploratory survey research design was adopted to obtain data from 326 respondents by using a self-completion questionnaire which consisted of two sections. Section A consisted of the personal information of the respondents and Section B measured the respondents’ general knowledge of GM food products as well as the sources from which GM-related information was obtained, by using a five-point Likert scale indicating their level of agreement between Strongly Disagree (1) and Strongly Agree (5). Descriptive statistics such as frequency, percentages, mean and standard deviation were used to analyse the data from both sections of the questionnaire and exploratory factor analysis (EFA) was also used to determine the underlying factors that influence the general knowledge of GM food products and the sources of information. The internal consistency reliability of both sections of the questionnaire was tested using Cronbach alpha (α).

Results

The results indicate that the respondents were not very knowledgeable about GM food products, although they knew what the term “genetically modified” meant, that they have heard about GM food products and that they knew that GM food products were available to purchase in supermarkets, but not sure which products were genetically modified. They knew maize contained a GM component but unsure if soybean and rice contained a GM component. The respondents did not look for any GM-related information from sources such as acquaintances, magazines, newspapers, the Internet and television. They were unsure which source was the most credible, although scientists were considered more trustworthy. From the EFA two factors emerged namely the extent of GM food product knowledge and the respondents’ unfamiliarity of GM food products together with its presence in GM food products were identified as the two main underlying drivers that epitomise the state of general knowledge of the respondents. The results of the EFA also showed that underlying information acquisition regarding GM food products relates to the source from which the information is obtained as well as the credibility of this source.

Conclusions and Recommendations

The extent of the respondents’ knowledge of GM food products is limited with uncertainty about the status on specific GM introduced products. The respondents’ extent of GM food product knowledge and their unfamiliarity with GM food products are the drivers of their lack of GM food product knowledge.

It is clear that consumers may not know enough about GM food products to make an informed decision about the food products on the market. It is important to reinstate the awareness of GM food products to improve consumers existing but out-dated knowledge and to provide new knowledge to those consumers who are not familiar with the concept of GM food products. Future research suggests using a qualitative research design to gain an in-depth understanding of consumers’ knowledge of GM food products.

References