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ASSESSING SALGANIK-HECKATHORN ESTIMATOR ON POPULATION CHARACTERISTICS

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ABSTRACT

Hidden populations are known to be populations that do not have the preference to be discovered in the society. Researchers studying social sciences find these populations very attractive yet extremely difficult to access. Of all the methodologies proposed thus far Respondent Driven Sampling has the highest potential to address these populations. Yet the methodology consumes a greater deal of resources both monetarily and man power which makes it difficult to do pilot studies in order to figure out the best parameters that should be used in the procedure. Salganik Heckathorn (SH) estimator is one of the acceptable estimates used for the population parameter estimation. Due to its simplicity many researchers favour to use SH estimator. Yet a considerable number of studies highlight the underperformance resultantly denigrating the estimator. This study tries to deflect these discredits by identifies the characteristics of the populations and the sampling combinations the estimator works best. It tries to overlay an open view on the estimator and assist the researchers to use the estimator in a way that would produce credible results.

Keyword: Respondent-Driven Sampling (RDS), Salganik-Heckathorn (SH) estimator, Simulation

INTRODUCTION

Drug users, Prostitutes, HIV infected people, etc. generally fall for the category of hidden populations. They play an important role in social corruption and thereby earns an urgent need of attention. Hidden property of these populations naturally doesn't place room for the existence of a sampling frame. Resultantly conducting statistical studies using probabilistic methodologies become questionable. Non-probabilistic sampling techniques such as convenient sampling, snowball sampling, judgemental sampling, etc. do allow to enter the pool of hidden populations yet does not allow to make credible statistical estimates. Of those introduced thus far Respondent Driven Sampling (RDS) has favourable characteristics to produce reliable estimates. SH estimator is one of the primitive estimators that could be used to estimate the population parameter when RDS is used as the sampling technique. Yet upon introduction of new estimators over the years the performance of SH estimator has been highly discredited. Regardless of these criticisms the popularity of the estimator remains due to its simplicity. The study done by Perera & Ramanayake (2019) proposes an algorithm to generate RDS populations.

Along with the assistance of this algorithm populations were simulated. Performance of SH estimator in each population and sampling technique were inspected with the aim to enlighten the usage of the SH estimator.

Respondent Driven Sampling (RDS)

Heckathorn (1997) first introduced the concept of RDS. From theoretical studies, it has proven that RDS consists of both probabilistic and non-probabilistic characteristics. The non-probabilistic characteristics enable to access these populations while probabilistic characteristics enable to do statistical analysis. The first few respondents are recruited by the researcher and referred to as 'Seeds'. Seeds get a reward for taking part in the study along with coupons for them to recruit individuals into the study. The first few individuals that get recruited by the seeds form the first wave. Recruits did by individuals in the first wave form the second wave. The process goes on until the desired sample size is met. Another important terminology used in RDS is 'degree' or 'network size' and refers to the entire number of individuals the respondent knows in the target population. Researchers has debated on the bias introduced by the mechanism used for seed selection. It can be proven that by adding more waves this bias could be mitigated. Theoretically, six waves would be enough to remove the bias introduced by seed selection (Magnani, et.al 2005).

Salganik-Heckathorn (SH) estimator

The SH estimator is one of the primitive estimators used in RDS. It essentially contemplates the referral pattern, network size, cross relation ties between subgroups of interest. SH estimator uses a two-stage estimation process. First data are used to make inferences about the network structure and use those inferences to make estimations (Wejnert, 2009). As the name

itself implies it was introduced by Matthew Salganik and Douglas Heckathorn in 2004 as an attempt to produce asymptotically unbiased estimators for RDS. It should be noted that the estimator can only handle dichotomous response variables. The SH estimator wraps up with a load of assumptions as cited from the work done by Salganik & Heckathorn (2004). They are seeds are selected with proportionate to their degree, all ties reciprocate, that is two people in a tie knows each other, sampling is done with replacement, respondents are accurately aware of their network sizes with individuals having the characteristic of interest, recruiter randomly select peers into the study using the coupons (weak existence of homophily), a respondent receives one coupon and recruit one peer and network of the hidden population forms one connected population. By following these assumptions, sampling occurs as a simple random walk. At the state of equilibrium, every respondent has a probability proportionate to their degree of being selected into the sample. Sampling is initiated, that is seeds are selected bearing the statement in mind. If a bias is introduced in the seed selection process, then sampling probabilities do not depend on the degree introducing bias to the final estimations as equilibrium is not met. In order to overcome this situation, studies must consist of long recruitment chains so that both the chain and the recruitment probabilities converge to an equilibrium (Fellows, 2018). It has been clearly stated by Salganik and Heckathorn, random seed selection equally produces asymptotically unbiased estimators for the population parameter. Yet a considerable number of studies put forward the inadequacy of the estimator when estimating the population parameter. This study tries to identify the combinations the estimator works well.

SIMULATIONS

The study makes use of two algorithms to simulate populations and to extract samples. 72 populations are generated by using the population simulation algorithm proposed by Perera & Ramanayake (2019) by changing the distributions for the degree (Skewed right, skewed left), proportion of response ($p = 1/3, 1/2$ and $2/3$), population sizes ($N=1000, 5000, 10000$), association types (response variable associated with only the Characteristic variable (indicated as C), associated with the Characteristic variable and degree (indicated as CD), associated with only the degree (indicated as D), randomly allocated (indicated as R))

After simulating populations, samples are extracted using 4 combinations of sampling from each population. For this the sampling algorithm proposed by Pathirana & Ramanayake (2017) was used. The combinations are 10 seeds and 2 coupons, 10 seeds and five coupons, 25 seeds and 2 coupons, 25 seeds and 5 coupons

500 samples from each combination were generated in order to get a distribution of the estimates.

RESULTS

Note on the graphical representation:

Instead of using boxplots a circle is used to represent the estimated mean (centre of circle) and to be the relative variance (area of the circle) of the estimations for unambiguosness. Association of the response variable with other variables in a population is represented using colour codes as both degree and character (Blue Circle), degree only (Green Circle), character only (Orange Circle) and random (Red Circle).

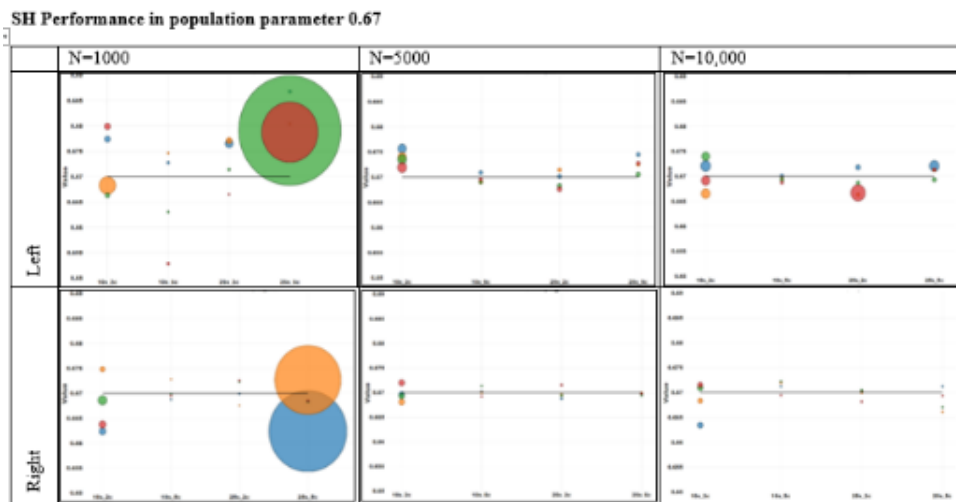


Figure 1: Performance of the estimator in populations with parameter 0.67

With respect to Figure 1, except for the case where the population size is 1000, in all other cases, the estimator works fine. Estimator works considerably well when a moderate amount of seeds and coupons was taken in all cases. When the population size is small and left skewed the best seed coupon combination would be 25 seeds and 2 coupons. In other cases, the SH estimator does not seem to perform pleasingly. A slight improvement in the performance could be seen when the populations are right skewed when compared with its corresponding left skewed population. When the population is moderate that is around 5000 higher number of seeds and coupons seems to favour the estimation. Estimator seems to perform in a way opposite ways in the corresponding left and right skewed populations. It is clearly seen when the population size is small. In left skewed populations where the variance of the estimator is high has a lower variance when the estimations are done in the corresponding right skewed distribution.

SH Performance in population parameter 0.5

Estimator shows a significant underperformance when the populations are moderate sized and have a left-skewed network size distribution as shown in Figure 2. Yet in the contrary the estimator shows a satisfiable performance when the distribution is right skewed. Estimator works significantly well when the population size in large compared to other sized populations. In higher population sizes high number of seeds and coupons favours the performance of the estimator than in other instances. On the contrary for small populations, higher number of seeds and coupons would not be a good pick. From what is seen in Figure 2 it is best to go for a moderate amount of seeds and coupons especially the population size is small.

In instances where the response variable shows an association with both the degree and the character variable the estimator seems to perform well than in other instances.

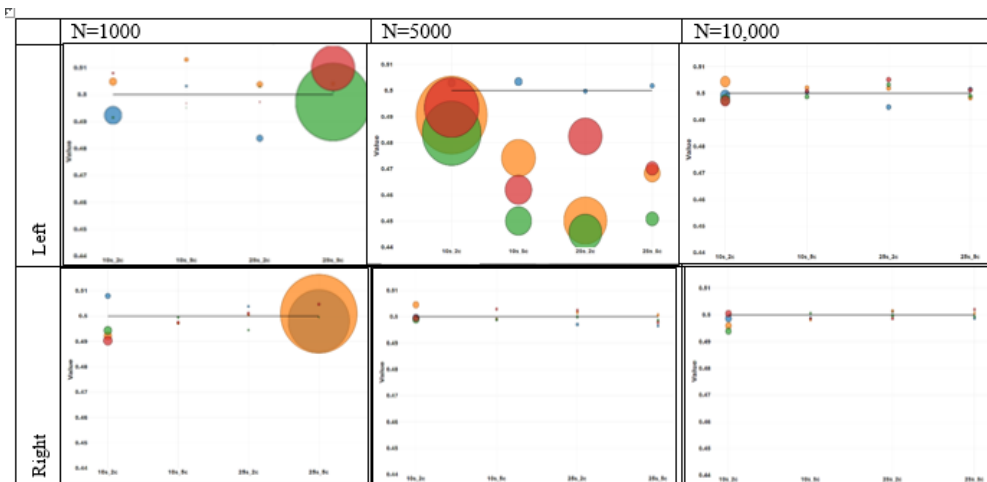


Figure 2: Performance of the estimator in populations with parameter 0.5

SH Performance in population parameter 0.33

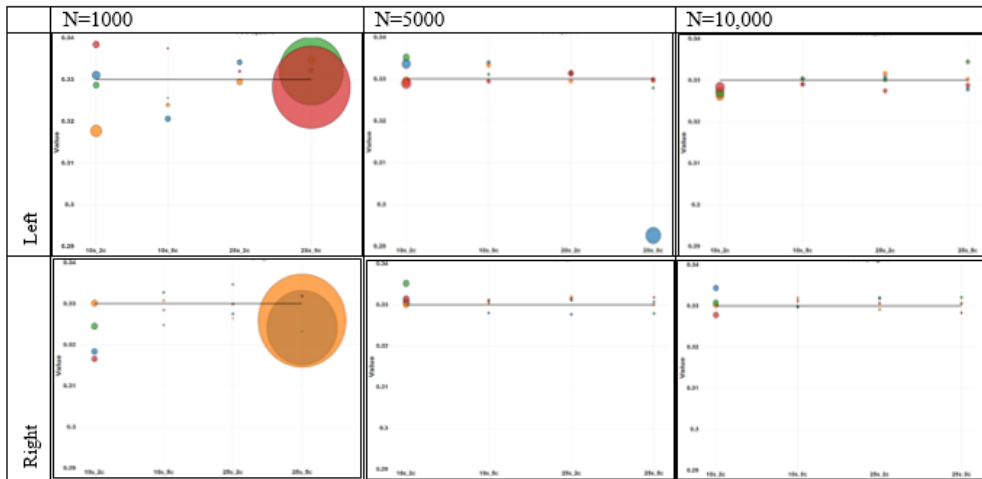


Figure 3: Performance of the estimator in populations with parameter 0.33

The pattern shown in Figure 1 show some similarities such as same variance distributions among populations, similar biases, etc. to those shown in Figure 3. Satisfactory performance could be seen in every seed and coupon combination except for the case in lower population size. Having a lower number of seeds and lower number of coupons does not facilitate for the performance of the estimator, neither does a larger number of seeds and coupons when the population size is small. A significant underperformance is seen when the response variable is proportionate to degree size and categorical variable when the population size is medium, left skewed and the number of coupons and seeds are high

CONCLUSION

Despite of the many studies highlighting the underperformance of SH estimator, the study highlights situations where maximum performance could be seen. When the population size is very large the estimator performs well

regardless of the sampling mechanism. Therefore, for larger populations, SH would be a good pick since the bias and the variance is small. At extreme ends, the estimators perform alike.

When the population size is small, a small number of seeds and coupons and a higher number of coupons and seeds should not be selected. A moderate amount of seed coupon would be preferable. A thorough analysis should be done on the seed coupon combination if to use SH as the estimator. It is best to avoid this estimator at these conditions.

When the population parameter is 0.5 a significant underperformance is seen when the population size is moderate, and the distribution is left-skewed. In such a situation using SH as the estimator may provide unreliable estimates.

It should be noted only 72 different populations are simulated. There are vast ways to extend this study to get a better understanding on the performance of the estimator. With the help of the developed algorithm by Perera and Ramanayake (2019) inspection of the performance of the estimator is way easier. This study

provides insight that SH estimator is not as bad as it is reputed to be. It shows evidence that there are instances where complete studies could be completely relied on this estimator. Yet the researcher needs to identify the properties of the target population before using this estimator since underperformance of the estimator also could be seen. It is always best to do a thorough pre-study before making the decision to use the estimator.

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DETERMINANTS ASSOCIATED WITH DRUG ABUSE SEVERITY AMONG YOUNG DRUG USERS IN BENGALURU

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ABSTRACTS

Plenty of studies have demonstrated family dysfunction and lack of religiosity as determinants of drug abuse. However, this fact does not guarantee that the factors would continue to be determinants of worsening the condition of drug users. The present study, drawing on the adaptational theory of drug abuse, examined whether drug users' self-evaluative family dysfunction and religiosity predict both drug abuse and abuse severity. It also investigated possible determinants of abuse severity. Abuse severity, family dysfunction, and religiosity were assessed among 50 young drug users in the city of Bengaluru, India. Their brief demographic and drug-related information was collected. For the control group composed of 68 young people who were not in drug use, family dysfunction and religiosity were measured. The results indicated that family dysfunction and lack of religiosity were not correlated with abuse severity though they tended to predict drug abuse. The duration of drug use appeared as a salient predictor of abuse severity. Early-onset of drug use and frequent arrest experiences were significantly correlated with abuse severity, yet they did not predict high severity. However, the study found the possibility that the two factors indirectly influence severe conditions by leading to long-lasting drug abuse. The

implications of the study were discussed in terms of drug policy and intervention.

Keywords: Drug abuse, abuse severity, risk factor, family dysfunction, religiosity.

INTRODUCTION

An epidemic of drug abuse threatens not only public health but also social stability due to the negative consequences. It is astounding to see today's unprecedented high record in drug production (United Nations Office on Drugs and Crime, 2018). A latest national survey of India, conducted among general population ranged from 10 to 75 years old by household visit, reported a radical spread of opioid use throughout India. The prevalence of drug use among Indian males (3.97%) has increased over five times than 14 years ago; the measure was noticeably worse than the global level (0.70%) (Ambekar et al., 2019). India is in an urgent need of effective drug prevention.

Drug prevention strategies require accurate understandings of the impacts of psychosocial risk factors on drug users to reduce the unnecessary efforts and find customized protective factors (Hawkins et al., 1992). Besides peer influence, there has been enough research that supports family functioning and religiosity as both

risk and protective factors in drug abuse. Scholars have investigated the two factors in terms of drug initiation, prevalence, and relapse. However, it has been rare to examine whether or how much drug users' perceptions of the two factors influence abuse severity in their continued drug use. We may hastily assume that drug users with higher risk factors would be more likely to be in severe conditions. However, that might not happen in their subjective views because of the adaptive effects that drug use provides.

Drawing on the adaptational (or psychosocial) theory of drug abuse (Hendin, 1980; Hendin & Hass, 1985), the present study assumed that influence of psychosocial risk factors to drug abuse would change as time goes beyond drug initiation stage. It also postulated that long-term drug use is one of the contributory factors to abuse severity. This study questioned if young drug users' perceptions of their family functioning and religiosity are significantly associated with their continuous deterioration in drug abuse. First, for this, it compared self-evaluative family dysfunction and religiosity between young drug users and non-drug-using youths. And then it investigated the associations of the two factors and abuse severity. Second, the study explored possible determinants of abuse severity among demographic and drug-related variables, mainly focused on the duration of drug use, drug initiation age, and arrest experiences.

REVIEW & THEORETICAL BACKGROUND

Family functioning and drug abuse

Drug abuse is interrelated with functional aspects of the family (Gruber & Taylor, 2008). Family functioning signifies the functional performance of structural and relational roles and actions that occur within the family as a system.

Over the last several decades, research has accumulated empirical evidence on the close relationship between family functioning and drug abuse. Children who grew up under poor parenting such as improper care, lack of monitoring, and parental disengagement were more likely to abuse drugs later (Bahr et al., 1998; Ewing et al., 2015; Nurco & Lerner, 1996). Studies also observed a lack of family bonds and poor attachment among young drug users (Hoffman, 1993; Nurco & Lerner, 1996). Sometimes, traumatic familial experiences like divorce, domestic violence, and emotional and sexual abuse were reported to play a role in bringing drugs into families (Edwards et al., 2017; Gutierrez et al., 1994; Hoffmann, 1993). Indian studies also observed a similar pattern in the relationship between family factors and drug abuse. Broken family, familial conflicts, physical and sexual exploitation, parental substance abuse, and familial history of crimes were frequently found among Indian children and adolescents with drug abuse (Benegal et al., 1998; Dhawan et al., 2016; Gupta et al., 2013; Sharma et al., 2015). Therefore, based on prior evidence, the study hypothesized that drug-using youths would be significantly higher in family dysfunction than non-drug-using youths (Hypothesis 1).

Religiosity and drug abuse

Religiosity refers to adherence to religious values and practices. There have been numerous studies reporting a negative relationship between religiosity and drug abuse for more than last four decades (Amoateng & Bahr, 1986; Dew et al., 2008; Gorsuch & Butler, 1976; Yonker et al., 2012). The majority of literature is from North American studies. Studies demonstrated that low religiosity was an evident predictor of substance use regardless of age, sex, drug types, number of supportive friends, and degree of mental distress (Bahr et al., 1998; Edlund et al.,

2010; Miller et al., 2000). Other studies have examined the delicate relationships of religiosity to drug abuse by distinguishing the internal importance of religion from external religious behavior. A study found that the importance of religion was a predictor of drug abuse (Lorch & Hughes, 1985). Chu (2007) also demonstrated a similar prediction of drug initiation by internal religious salience, yet drug cessation was not predicted by the importance of religion but by devotional behavior. Another study observed that adolescents who were in more agreement with Christian commitment statements had less likelihood of drug use (Hope & Cook, 2001). Regular attendance at church services was observed to associate with the reduction of drug use in both clinical and non-clinical adolescents (Pullen et al., 1999; Richard et al., 2000). Religious abstinence might be one of the persuasive reasons why religiosity is negatively related to drug abuse in Western contexts, especially in North America. Empirical studies reported that individuals from abstinent, anti-drug, and conservative religious denominations tended to show less involvement in drug abuse (Amoateng & Bahr, 1986; Miller et al., 2000). Reviewing literature, Gorsuch (1995) pointed out that pro-drug religious cults or restrictive religions might not have desirable effects as protective environments.

During the last decade, scholars in countries outside North America have paid attention to religiosity regarding drug abuse. Brazilian studies showed similarity with the findings in North American literature. Young people with higher religiosity or in more religious involvement appeared to have less likelihood of drug use (Rezende-Pinto et al., 2018; Van der Meer Sanchez et al., 2008). A study in Iran, a non-Western country in which the majority is Muslims, also found that college students with higher religiosity were less likely to use

drugs (Mohammadpoorasl et al., 2014). Indian academics have rarely explored the empirical relationship between religiosity and drug abuse. However, based on the prior literature, the study also assumed that drug-using youths would be significantly lower in religiosity than non-drug-using youths (Hypothesis 2). According to the latest Indian Religion census, India has almost 99.8 percent of the religious population; the majority are Hindus (79.8%) followed by Muslims (14.23%), and Christians (2.30%) (Census 2011, 2015). Unlike Western countries rooted in Christian individualism, religious communalism has been a prominent characteristic in overall societies of India (Chandra, 2008). Traditionally, cannabis has been for religious and medicinal purposes in India (Russo, 2006; Touw, 1981). Some states in India have recently legalized the use of bhang (a less intoxicating and edible type of cannabis).

Psychosocial risk factors and adaptation

As a theoretical basis, the research draws on an adaptational theory of drug abuse (Hendin, 1980; Hendin & Hass, 1985). Hendin (1980) extended the scope of analysis from psychodynamics through psychosocial dynamics. He viewed an individual's drug use as an adaptational attempt to social relationships and environments. From his point of view, drugs furnish drug users with a sense of relief from the pressure of their psychosocial problems. Though drugs are often for recreational purpose, they also play a role like a mitigative from violent impulses or depressive emotions (Hendin & Haas, 1985). Hendin (1973) found that college students tended to use drugs to help their academic achievement or reduce competitive pressures. Hendin and Hass (1985) observed young marijuana users in the context of family dynamics and finally summarized their pattern as "troubled adaptation" (p. 114). That refers to drug users' tendencies to adapt themselves to

their troubled situations with the help of drugs even while they become chronic and face ongoing self-destructiveness. Young drug users may face conflicts between adaptational effects of drug use and the adverse consequences. However, as they gradually depend on drugs, they may put more stress on the adaptive function of drug use rather than being attentive to the harms caused by their drug use. This troubled adaptation may lead to the possibility that drug users change their perceptions and interpretation of their psychosocial environments while they continue to use drugs. For example, as they get accustomed to drugs and drug subculture, they can think other issues lightly or differently. Therefore, the present study premised that troubled adaptation, as one of psychosocial dynamics of drug abuse, would occur in drug users' perceptions of psychosocial risk factors.

Family functioning, religiosity, and abuse severity

The study questioned whether drug users who perceive higher family dysfunction or lower religiosity would be likely to be more serious in their abuse condition. From the adaptive view, the study assumed that their perceptions of the risk factors might not be determinants of the continuous deterioration of drug users' conditions. Therefore, the study hypothesized that drug users' self-evaluative family dysfunction and religiosity would not be significantly associated with their abuse severity (Hypothesis 3). Conceptually, a risk factor to drug abuse does not necessarily mean that it would also worsen the condition of drug abuse. For instance, suppose a lack of parental monitoring was found as a strong risk factor to a teenager's initiation of drug use. This, however, does not imply that the risk factor had increased the adolescent's drug dependence. The relationships between a risk factor of drug abuse and

abuse severity should be distinct from the one between the risk factor and the prevalence (or likelihood) of drug abuse. Gorsuch (1995) classified substance abuse into three steps: initial use, continued use, and dependence. He argued that the goal of drug prevention should be differentiated according to the stages because drug users' perceptions and controllability over drug dependence vary by the stage. Drug abuse severity is a crucial consideration when a drug user is engaged in the stages of continued use and dependence after their initial stage.

Furthermore, it is necessary to examine drug users' abuse severity in consideration of the psychosocial dynamics of drug abuse. There was a study that predicted the results without considering the psychosocial dynamics in drug users and their family members. Noone (1983) empirically investigated the associations between family functioning and abuse severity. He divided sixty drug abuser's families, who participated in an outpatient program, into two groups according to abuse severity (mild: 30 families, severe: 30 families). Both family members and drug abusers assessed their own family cohesion and adaptability. The researcher hypothesized that family functioning would be more dysfunctional in the severe group than the mild group. However, unlike his expectation, the research ended up with the result that family cohesion and adaptability were not in satisfactory associations with abuse severity. The study expected to replicate similar findings in the subjective perceptions of young drug users. With its focus on religion, the researcher could find a glimpse of different associations between religiosity and drug abuse according to individuals' facing contexts. For example, a study of Chu (2007) demonstrated that the importance of religion was a significant predictor of the initiation of drug use. However, the intrapersonal religiosity was not significantly associated

with cessation from drugs among those already in their continued use. Drabble et al. (2016) compared religiosity and lifetime substance abuse between heterosexual and non-heterosexual women. Religiosity was a predictor of substance abuse among the heterosexual females. However, religiosity was not a predictor among sexual minority females who included notably more long-term users than the heterosexual. All these findings support that the two risk factors of drug abuse may not be determinants of abuse severity due to drug users' adaptive psychosocial dynamics.

Determinants of abuse severity

The severity of drug abuse (including dependence and addiction) is a crucial indicator to help practitioners decide the degree of treatments and interventions for the clients. High severity in drug abuse may lead to negative emotions, risky behaviors, and premature deaths due to accidents or suicidal attempts (Chaudhury et al., 2010; Fernández-Serrano et al., 2010; Maynard et al., 2016; Simoneau et al., 2016). The biopsychosocial factors associated with the deterioration of drug abuse are crucial for the prevention of drug abuse and the related harms. First, substances have biochemical adverse effects in terms of abuse severity. Latest studies observed that hormones and cerebral functions were associated with the severity of substance addiction (Escobar et al., 2018; Moreno-López et al., 2012). Drug types can differently influence drug abuse severity according to the addictiveness and patterns. Meyer et al. (2015) examined the association between the history of heroin use and the seriousness of opioid abuse. They found that opioid users who had a more frequent history of heroin use were more severe in their abuse than those with less heroin use. Another study reported that patients in comorbid opiate and cocaine dependence were found to be highly addictive

compared to people in opiate dependence (Rodríguez-Cintas et al., 2016).

Second, scholars have found that abuse severity is connected to psychological or mental problems. A recent study demonstrated that more psychiatric symptoms predicted higher severity in drug addiction among methamphetamine-dependent individuals (Polcin et al., 2015). There are some specific mental disorders empirically proven to be associated with abuse severity. For example, clients who are in attention deficit hyperactivity disorder (ADHD) and conduct disorder are often reported to be more likely to be higher in addiction severity (Carpentier et al., 2010; Dunne et al., 2014; Torok et al., 2012; Yewers et al., 2005). Severe drug abuse often exposes individuals to sexual abuse and violence that cause psychological trauma or depression. A study observed that 29 percent of opioid-dependent participants diagnosed as post-traumatic stress disorder (PTSD) were significantly associated with high addiction severity (Clark et al., 2001). Another study conducted among Portuguese drug users reported that depression was strongly related to abuse severity, especially in females than males (Coelho et al., 2000).

Third, research on social determinants of abuse severity has been rare. Though migration was known to be a risk factor to drug abuse, a study observed that it had a non-significant relationship with severity (Carballo & Nerukar, 2001; Taïeb et al., 2012). There was some literature dealt with socio-demographic factors in consideration of drug abuse severity. A study of Coelho and his associates (2000) found significant associations between severity and some socio-demographic factors. Male, non-married, and unemployed participants appeared to be more severe in drug abuse than the others. However, in another study in Israel, female drug users were more severe than male users (Isralowitz et al., 2007).

Treatment is one of the crucial social elements in the reduction of the severity of drug abuse. Drug users who had ever exposed to clinics were significantly lower in abuse severity than those who never resorted to treatment (Coelho et al., 2000). Another study demonstrated that more accessibility and continuity to primary care predicted lower abuse severity (Kim et al., 2007).

Duration of drug use, early initiation, and arrest experiences

The study explored three variables the duration of drug use (duration), drug initiation age (initiation), and the number of arrest experiences (arrests) as plausible determinants of abuse severity. Most of all, the study paid attention to the duration of drug use as a more salient determinant of abuse severity than initiation age and arrests. It hypothesized that duration would positively predict abuse severity among participants in drug use (Hypothesis 4). Based on the adaptational theory (Hendin, 1980), the study defined the duration of drug use as a period of maintaining troubled adaptations to drug abuse. Drug users may gradually become insensitive to the negative consequences as the period gets longer. Prolonged drug abuse is found to increase drug-induced emotional disturbance and brain malfunctions (Fernández-Serrano et al., 2010; Moreno-López et al., 2012). A few studies partly dealt with the association between the duration of drug use and abuse severity. Coelho et al. (2000) reported that participants in a group with higher abuse severity were in a more prolonged period of drug use. Meyer et al. (2015) found that using opioid with heroin led to a more extended period of drug use than consuming opioid alone. Also, the group in more severe conditions of heroin abuse was significantly longer than the less severe group in the period.

Next, the study looked at the associations of the duration of drug use

with initiation age and arrest experiences in predicting abuse severity. In general, youngsters' longstanding drug use signifies relatively early drug initiation. Also, there might be more arrest experiences among long-term drug users. First, the study assumed that drug initiation age would be significantly associated with abuse severity (Hypothesis 5). From the adaptive view, Hendin (1980) argued that one's earlier drug initiation might lead to more significant impairment because the early-onset reflects adaptive vulnerabilities in their young ages. There is some evidence that the earlier history of drug use predicted more severe and earlier drug dependence in young adulthood (King & Chassin, 2007; Walters & Urban, 2014). Others observed that the early-onset of substance use was positively related to abuse severity among adult offenders (Gustavson et al., 2007; Tillson et al., 2018). Second, the researcher hypothesized that the frequency of arrest experiences would be significantly associated with abuse severity (Hypothesis 6). From the adaptive perspective, young drug users may gradually put more significance in continuing drug use while being dependent on drugs, in spite of the disadvantages of legal punishments. Coelho et al. (2000) found that those who went through crimes and detentions were assessed higher in abuse severity than those who have no experiences.

METHODS

Participants

Table 1 Socio-demographic characteristics of drug-using youths (DY) and non-drug-using youths (NY).

Socio-demographic variables	Frequency (%)		X ²	p-value
	DY	NY		
Developmental stages			3.112	.078
Adolescence	38.0	54.4		
Early adulthood	62.0	45.6		
Education level			13.515	.004
Below 7 th Standard	16.0	1.5		
8 th to 12 th Standard	36.0	23.5		
Undergraduate/graduate	44.0	63.2		
Above postgraduate	4.0	11.8		
Religion			3.725	.293
Hinduism	60.0	58.8		
Islam	22.2	11.8		
Christianity	16.0	22.9		
Other	2.0	1.7		

Participants are 50 acting drug-using youths aged 17 to 27 years ($M = 20.86$, $SD = 2.59$) and 68 non-drug-using youths aged 17 to 28 years ($M = 19.96$, $SD = 2.36$) in the metropolitan areas of Bengaluru, India. All participants were males. Ages between two groups had similar distributions ($t = 1.97$, $p > .05$). Table 1 describes the socio-demographic characteristics of both groups. Participants in adolescence and early adulthood had similar distributions between the two groups. Religious distributions had a similarity; however, education level was different in the distributions.

PROCEDURE

The researcher collected data from drug-using youths by a snowballing sampling, and then, carried out a quota sampling among non-drug-using youngsters to increase the socio-

demographical homogeneity between groups. A documented informed consent was obtained from each participant in respect of their autonomy, and the anonymity and confidentiality of information were ensured and maintained (National Committee for Ethics in Social Science Research in Health, 2004). Participants in both groups evaluated their own family dysfunction, religious commitment, and drug abuse severity and their demographic information (age, education level, religion, and income) was investigated. Drug-related information was collected from drug-using participants: duration of drug use, drug initiation age, number of drug-related arrests, number of other criminal arrests, and presence of drug user(s) in family. The survey for the drug-using group included youths who had been using at least one illegal drug along with other substances for more than one year.

INSTRUMENTS

Family dysfunction was measured by the general functioning scale, a concise version of McMaster family assessment device (FAD), which is composed of six domains of family functioning: problem-solving, communication, roles, affective responsiveness, affective involvement, and behavior control (Epstein, Baldwin, & Bishop, 1983). The study used the general functioning scores without dealing with the specific dimension scores. Participants were asked to answer on 4-point Likert scales. Higher scores indicate more dysfunctional. The total score is the mean value of all 12 items.

The religious commitment inventory scale (RCI-10) assessed religiosity (Worthington et al., 2003). One of merits of the tool is its broad applicability to various religions. The scale is composed of two operational variables: interpersonal and intrapersonal commitment. Interpersonal commitment is the degree of engagement to religious relationships and practices. Intrapersonal commitment is defined by the degree of adhering to religious values and beliefs. The score of each dimension is the sum of the scores of the relevant items. A higher score indicates a greater commitment.

To assess drug abuse severity, Drug Abuse Screening Test (DAST)-10 was used (Skinner, 1982; Nicholson, Duncan, White, & Watkins, 2012). The scale was given to even non-drug-using participants to verify them once more. Individuals who had been in more than 12 months of drug use were asked to answer “yes” or “no” to each question about drug-related experiences. For example, “Do you abuse more than one drug at a time?” “Are you unable to stop abusing drugs when you want to?” The score is the counted number of “yes” in each question except for an item to add reversely. The range of score is 0 to 10.

DATA ANALYSIS

IBM SPSS Statistics version 25 was used for data analysis. In the first section, family dysfunction and religiosity (interpersonal and intrapersonal) were compared between drug-using youths and non-drug-using youths. Pearson correlations were tested to analyze the primary relationships among variables. A Mann-Whitney U test compared family dysfunction between the groups because it did not satisfy the homogeneity of variance in two groups. Independent samples t-tests were employed to examine the differences in religiosity variables between the two groups. In the second section, Pearson correlations were used to investigate the associations of abuse severity with family dysfunction and religiosity and to find out correlated variables with abuse severity. A multiple linear regression was employed to predict abuse severity by three associated independent variables: duration of drug use, initiation age, and arrest experiences.

RESULTS

Family dysfunction and religiosity

A significant correlation was observed between family dysfunction and age among non-drug-using youths (NY) ($r = -.263, p < 0.05$). The correlation was non-significant among drug-using youths (DY) ($r = .189, p = 0.189$). Significant correlations between two religiosity variables were observed in both DY ($r = .534, p < 0.01$) and NY ($r = .662, p < 0.01$). A contrasting result was found between two groups; religiosity had a significantly negative correlation with education level among DY (interpersonal: $r = -.557, p < 0.001$, intrapersonal: $r = -.400, p < 0.01$) whereas a non-significant correlation was found among NY (interpersonal: $r = -.005, p = 0.971$, intrapersonal: $r = .132, p = 0.282$). Especially, a significant correlation between religiosity and

education level was observed among Hindu DY (interpersonal: $r = -.663$, $p < 0.001$, intrapersonal: $r = -.376$, $p < 0.05$).

Table 2 Mean and standard deviation of psychosocial variables in drug-using youths (DY) and non-drug-using youths (NY).

Psychosocial variables	Mean \pm Standard deviation		<i>p</i> -value
	DY (n=50)	NY (n=68)	
Family dysfunction	2.13 \pm 0.39	1.98 \pm 0.57	0.045 ^{a**}
Religiosity (interpersonal)	10.92 \pm 4.04	11.31 \pm 4.78	0.642 ^b
Religiosity (intrapersonal)	16.58 \pm 4.80	18.00 \pm 5.92	0.166 ^b

** $p < 0.05$ a Mann-Whitney test b Independent samples *t*-test

To test the first and second hypotheses, family dysfunction and religiosity (interpersonal, intrapersonal) were compared between NY and DY. Table 2 describes the mean value and standard deviation of three dependent variables in both groups. A Mann-Whitney test indicated that drug-using youths (Mdn = 2.04) were significantly dysfunctional than non-drug-using youths (Mdn = 1.88) in the family functioning, $U = 1332.5$, $p < .05$, $r = 0.18$. An independent samples *t*-test indicated that drug-using youths were non-significantly higher in both interpersonal and intrapersonal religiosity variables.

Table 3 describes the results in three religious groups (Hinduism, Islam, and Christianity). Participants were split by religion into three divisions. After assuring normal distributions and the homogeneity of variance in each religious group, an independent samples *t*-test compared religiosity variables between DY and NY. Hindu and Muslim samples did not show any significant differences between DY and NY. However, Christian participants' sample showed a considerable gap between DY and NY.

Drug-using Christian youths were significantly lower than non-using Christian youngsters in their interpersonal and intrapersonal religious commitment, especially more outstandingly in intrapersonal religiosity.

Next, another correlation test examined

Table 3 Mean and standard deviation of religiosity by religion in drug using youths (DY) and non-drug-using youths (NY).

Religion	Religiosity	Mean ± Standard deviation (n)		p-value
		DY	NY	
Hinduism (n = 70)	Interpersonal	10.77 ± 4.13 (30)	10.40 ± 4.87 (40)	0.741
	Intrapersonal	16.40 ± 4.51 (30)	16.03 ± 5.19 (40)	0.753
Islam (n = 29)	Interpersonal	12.09 ± 3.14 (11)	12.13 ± 5.57 (08)	0.987
	Intrapersonal	18.00 ± 4.49 (11)	19.00 ± 5.90 (08)	0.680
Christianity (n = 27)	Interpersonal	9.50 ± 4.87 (08)	12.95 ± 4.08 (19)	0.069*
	Intrapersonal	14.50 ± 5.83 (08)	22.16 ± 5.26 (19)	0.003***

N = 116 *p < 0.1 ***p < 0.01

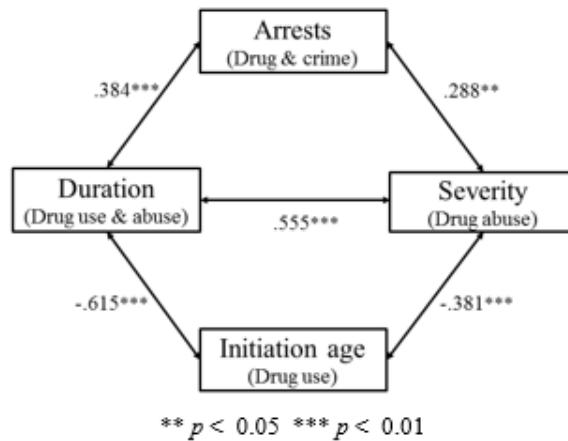
In sum, the results regarding family functioning demonstrated Hypothesis 1 by showing that DY’s self-report family dysfunction was significantly higher than NY’s. However, the findings in religiosity partially supported Hypothesis 2 only among Christian participants. DY were more likely to report that they are not religious compared to NY among Christian participants. However, Hindu and Muslim participants did not show any notable differences between DY and NY.

Determinants of drug abuse severity

To test the third hypothesis, correlations were analyzed among variables: family dysfunction, religiosity (interpersonal, intrapersonal), and abuse severity. As a result, both family dysfunction (r = -0.075, p = 0.607) and religiosity (interpersonal: r = 0.144, p = 0.320, intrapersonal: r = 0.189, p = 0.188) were found to be non-significantly correlated with abuse severity. The findings supported Hypothesis 3 that the two psychosocial risk factors would not be associated with abuse severity. Family dysfunction and low religiosity were not significant determinants of abuse severity.

demographic and drug-related variables. Abuse severity was non-significantly correlated with age, religion, education level, income, presence of drug user(s) in family, and number of criminal arrests (all p > 0.05). However, it had significant correlations with the duration of drug use (r = .555, p < 0.001), initiation age (r = -.384, p < 0.01), number of drug-related arrests (r = .297, p < 0.05), and total number of arrests (r = .288, p < 0.05). The duration of drug use was highly and significantly correlated with initiation age (r = -.615, p < 0.001). The result supports that those who initiated drug use earlier than others may have more likelihood of longer duration in drug use. Figure 1 portrays the relationships of the variables significantly correlated with abuse severity.

Figure 1 Variables significantly correlated with drug abuse severity.



A hierarchical multiple regression analysis was conducted to predict abuse severity based on the duration of drug use (duration), initiation age (initiation), and the number of arrests (arrests). Table 4 described the results of the hierarchical regression model. Duration of drug use appeared as a salient predictor. In Model 1, duration alone explained 30.8 % of abuse severity; duration increased 0.331 of an abuse severity score for a year. In Model 2, initiation age increased 0.3% more than the first model. As all three variables were included in Model 3, there was only an increase of 1.4 % in predicting abuse severity compared to Model 1 with maintaining still high prediction by the duration of drug use (44.2%). The result showed that the duration of drug use is the strongest predictor of abuse severity among the three variables.

Next, a multiple linear regression was calculated to predict the duration of drug use by initiation age and arrests. The multiple regression model indicated a strong and positive prediction of duration with an R^2 of .519, $F(2, 47) = 25.348$, $p < 0.001$. Initiation age and arrests explained 51.9 % of the duration of drug use. Both initiation age ($\beta = -.612$, $t = -6.045$, $p < .001$) and arrests ($\beta = .376$, $t = 3.713$, $p < .001$) predicted the duration of drug use.

Table 4 Hierarchical multiple regression models of predicting drug abuse severity based on duration of drug use, initiation age, and frequency of arrests.

Predictor	Model 1			Model 2			Model 3			VIF
	SE	β	t	SE	β	t	SE	β	t	
Duration	0.07	0.55	4.626*	0.09		3.345*	0.10		2.524*	2.07
Initiation age			**	1	0.513	*	4	0.442	*	9
Arrests				0.09	-		0.10	-		1.77
				5	0.068	-0.445	0	0.111	-0.688	8
							0.14			1.29
							1	0.119	0.859	3
$R^2(\Delta R^2)$	0.308			0.311 (0.003)			0.322 (0.011)			
F	F(1, 48) = 21.398 ***			F(2, 47) = 10.619 ***			F(3, 46) = 7.286 ***			

** $p < 0.05$ *** $p < 0.01$

Figure 2 Path diagram via regression in predicting abuse severity based on duration, arrests, and initiation age

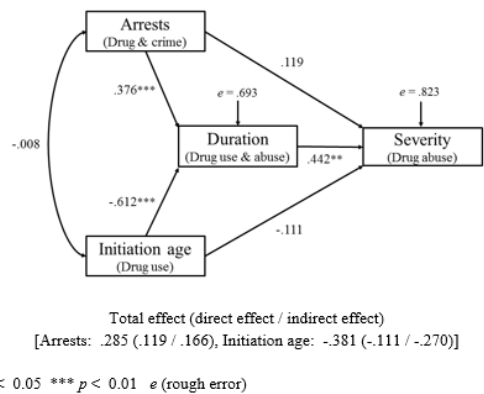


Figure 2 describes a path diagram which reduced the overall results of the regression models. The rough error variances (e values) were calculated as $\sqrt{1-R^2}$. The e value for duration was 0.693. The e value for abuse severity was 0.823. Arrests ($\beta = .119$, $p = .395$) and initiation age ($\beta = -.111$, $p = .495$) did not directly predict abuse severity. However, both variables significantly predicted duration. In the path diagram, the rough estimates of indirect effects of the two variables through duration were respectively .166 and -.270. In the estimated total effects, arrests explained 28.5% of abuse severity and initiation age explained 38.1% of abuse severity.

In sum, this section verified Hypothesis 4 by indicating that longer duration of drug use predicted higher abuse severity. It also verified Hypothesis 5 and 6 by showing significant correlations between the other two variables (initiation age and arrests) and abuse severity. However, they were not found as predictors of the duration of drug use. Instead, they had indirect effects in predicting abuse severity by way of the duration of drug use.

DISCUSSION

Risk factors in drug abuse vs. determinants of abuse severity

As reviewed in the prior empirical literature, family dysfunction and low religiosity have been remarkable psychosocial risk factors for drug abuse. The study replicated the previous evidence by demonstrating that family dysfunction was a notable risk factor for drug abuse. The family dysfunction level reported by drug-using youths (DY) was significantly higher than the level of non-drug-using youths (NY). However, when it comes to religiosity, there were different results by religion. Low religiosity appeared as a predictor of drug abuse by demonstrating a significant difference between Christian DY and NY participants. The result is in

line with most of the prior research conducted under the background of Western Christianity. However, Hindu and Muslim participants did not show any significant differences between DY and NY. It became challenging to regard that low religiosity would be a risk factor for drug abuse among young Hindu and Muslim drug users. There should be further studies to clarify what made such differences in the outcomes according to religion. However, at least the results imply that religiosity may have different influences on drug abuse according to religious values and cultural practices. As reviewed, most of the North American literature that reported a negative relationship between religiosity and substance abuse was in the contexts of Christianity and similar denominations. Abstinence from substances was an outstanding emphasis on their religious principles and exercises (Amoateng & Bahr, 1986; Levy, Campbell, Shea, & DuPont, 2018; Miller et al., 2000). In contrast, Indian Hindu and Muslim cultures seem to have been traditionally and relatively tolerant in substance use compared to Western religions.

Another significant finding of the study was that young drug users' perceptions of their family dysfunction and religiosity were not significantly associated with their abuse severity. Family dysfunction was not a significant determinant of abuse severity among DY, even though DY's family dysfunction was significantly higher than NY's. The evidence replicated the empirical findings of Noone (1983) in terms of the dissociation between abuse severity and family functioning. Abuse severity was also found to be non-significantly related to religiosity among all Hindu, Muslim, and Christian DY. The results support that psychosocial risk factors to drug abuse are not necessarily the determinants of abuse severity. They also imply the possibility that adaptive psychosocial dynamics cause changes in

the perceptions of young drug users in spite of the negative consequences of drug use.

Duration of drug use and abuse severity

First, the study demonstrated that the duration of drug use was a salient predictor of drug abuse severity among youths in continued drug use. The result corresponds to the prior evidence about the negative influence of prolonged drug uses in the conditions of drug users (Coelho et al., 2000; Fernández-Serrano et al., 2010; Meyer et al., 2015; Moreno-López et al., 2012). Next, early drug initiation and arrests appeared as notably associated with the protracted drug use among young drug users. Though drug initiation age and arrests did not predict abuse severity, it was plausible for them to have indirect effects on abuse severity by way of the prolonged period of drug use (Figure 2).

The overall findings suggest that long-term drug use play a significant role in the deterioration of young drug users' conditions while interacting with other drug-related maladaptive factors. As the study demonstrated, the earlier drug initiation in itself may not explain higher abuse severity. However, the negative impact of early-onset can lead to more unstable conditions over time through the dysfunctional adaptations toward drug abuse. This point can explicate the prior evidence on why an individual who had an earlier onset of drug use appeared to be more chronic conditions in adulthood (Gustavson et al., 2007). More precisely, drug users who had earlier initiation of drugs are likely to be in a more extended period of drug use, and the lengthened duration may work as the main cause of increasing abuse severity. In sum, the overall results suggest that long-term drug use is a core predictor of severe drug abuse. Also, the prolonged period of drug use provides the space where other risk

factors may indirectly increase abuse severity.

SUGGESTIONS

The overall findings of the study lead to suggestions regarding drug prevention and intervention policy among young drug users. Firstly, the observed dissociation between the two psychosocial risk factors and abuse severity suggest that there should be customized interventions in consideration of their dysfunctional adaptations. Practitioners in the treatment and prevention of drug abuse used to keep paying attention to psychosocial risk factors in and around individuals with drug abuse. Upon this, the study suggests taking their maladaptive dynamics into practitioners' considerations. It is because psychosocial risk factors to drug abuse may not be significantly associated with continuous deterioration of drug users' conditions. Today's prevention science for adolescent drug abuse looks more targeted on teens who are susceptible to drug use or in their initial use stage. The applications are mainly about reducing psychosocial risk factors while strengthening protective factors. However, it is another demand to develop proper prevention strategies for late adolescents or young adults who are already in their continued and dependent drug abuse (Robertson, David, & Rao, 2003). Therefore, the study urges efforts to bring more authentic evidence of dysfunctional adaptations of drug abuse among young drug users placed in continued drug use. Sophisticating knowledge of the ongoing psychosocial dynamics about risk factors is necessary for more systematic approaches (Csiernik, 2002; Gruber & Taylor, 2008). The attempts are expected to help effective prevention strategies and also serve to contrive plans reflecting the maladaptive dynamics into the consideration of treatment and intervention.

Secondly, the highlighted importance of the duration of drug use as a core determinant of abuse severity among young drug users suggests a need of flexible connectivity among strategies in drug policy toward prompt and early intervention in continued drug abuse. Prior empirical literature and the study have indicated the significant associations among duration, early drug onset, criminal involvement, and abuse severity. Prolonged drug use was a decisive predictor of abuse severity among young people who are already in regular drug use after initiation stage. The study suggests that drug policy should take a look at ways to shorten the duration of their continued drug use as early as possible. For decades, the Indian government has maintained a trifold strategy in drug policy to reduce drug supply, demand, and the harm caused by injecting drug use (Tandon & Collective, 2015). Legal sanctions and criminalization regulate drug supply and demand. Indispensable contributors to drug demand reduction are treatment and rehabilitation interventions. However, those seeking therapeutic help are extremely rare among individuals in problem drug use. Only about 12 percent of all drug-dependent people were estimated to have experienced hospitalization or other treatments (Ambekar et al., 2019). Harm reduction strategies have approached injecting drug users (IDUs) through targeted interventions under the National AIDS Control Program (NACP). The aim was mainly to prevent the transmission of Human immunodeficiency virus (HIV). Harm reduction programs may not be sufficient for drug prevention due to the pragmatic focus on the prevention of imminent hazards rather than abstinence from drugs (Hathaway, 2001). The approaches require continuous efforts to complement the shortcomings lest they catalyze long-lasting drug abuse. On the other hand, the approaches can be a

channel to reach acting drug users and surface them out of their unexposed and continued drug abuse. Compared to punitive legal strategies, harm reduction strategies maintain more receptive attitudes toward working drug users. They can take advantage of the openness to prevent their continued drug abuse. Specifically, the study suggests that harm reduction policies in India are in an urgent need of extending the scope of service among children and adolescents below 18 years (Dhawan, Pattanayak, Chopra, Tikoo, & Kumar, 2016). However, the extension of harm reduction strategies to the younger age group will be more active in the condition of securing flexible connectivity with customized therapeutic interventions and drug prevention strategies.

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RESEARCH ON THE APPLICATION OF SOUND DESIGN IN INTERACTIVE INSTALLATION ART IN PUBLIC ENVIRONMENT

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ABSTRACT

Since its emergence, installation art has been characterized by high social significance, wide range of subjects and active use of new science and technology as a means of design. The site specificity, narrativeness and publicness of public installation art make it one of the important ways to show the concepts and characteristics of a region. In recent years, public installation art has gradually shown an interactive trend. While appreciating art, people pursue spiritual "closeness", "dialogue" and immersion, instead of merely staying on the visual effect. Sound is often regarded as a secondary element in design. However, as a matter of fact, as one of the five senses, sound is a very perceptual medium of communication that can provide personal special feelings and common emotional reactions. Compared with image, sound records an emotional background in a richer way, provides the atmosphere and state, creates imagination space for human perception, and lays a foundation for the realization of design narration. With the help of the narrative function of sound, the visual and touchable installation art can enrich the design experience in the dimension of auditory communication, also be easily received by the audience and interact with them. Sound design can not only provide ordinary participants with extraordinary immersion experience, but also increase the sense of participation of the people

with visual impairment and improve the space narration construction of public installation art.

With acoustics, psychology, perceptual theory as its theoretical support, this paper analyzes the application of sound design in the art of public interactive installation through case studies; analyzes the commonalities, characteristics and design trends manifested by different regions, and studies how to achieve a better effect of interactive experience through design optimization.

Key words: sound, interaction, public environment, the art of interactive installation

INTRODUCTION

"Science and technology can change life" sounds like a cliché. However, since the 20th century, the rapid development of science and technology has not only promoted the urbanization of the whole world on a large scale, but also improved the daily life of human beings indeed. At the same time, it has brought tremendous changes to the spiritual life and artistic experience of human beings. Public art in a broad sense refers to all works with an artistic sense in public space. In the context of rapid economic and technological development, public art, as one of the spiritual carriers, has been also

expanding its own field at a considerable speed. With the support of science and technology, public art is not only confined to architecture, sculpture, landscape, painting and other aspects, but also has various expression forms of new media. As a hotbed for the development of science and technology and new media art, cities breed various new forms of public art. At the same time, public art communicates with the community and the public, affects the life of human beings in cities, and shapes the unique temperament and personality of each city.

The art of interactive installation in public art is also a part of the new media art. Its flexible forms of expression cover a wide range. Because it can bring a strong sense of immersion to and arouse the resonance of experiencers, it has a very strong influence in the art field today. In the era of digital media, interactive experience is the general trend. Nowadays, artworks begin to be judged by the audience's experience. Previous installation art mostly existed in the visual category of "seeing", while the combination of sound and installation art is the mutual promotion of hearing and vision. Expanding the creative performance field of installation art can enhance the perception level of experiencers more effectively. The art of interactive installation makes experiencers from the design ideas of "being given" by artists or designers to "dialoguing" with the works, and participating in the works to construct their own artistic experience with their own perception.

THE ART OF PUBLIC INTERACTIVE INSTALLATION

Literally, "sound", "interaction", "installation art", "public"---Here, the author tries to explain the definition of the art of public interactive installation ---A structural installation and a unique art

form for the author to create a meaningful space scene in a public place by using a variety of carriers, generate feedback according to the behaviors of experiencers, and provide experiencers with immersion experience, so as to achieve interactive communication with the public, with sound as the design element, with computer graphics, human-computer interaction, information collection, processing, computation and other media technologies as tools.

The past and present of the art of public interactive installation

As early as in ancient Greece, European countries had the tradition of setting up commemorative sculptures on the open city squares, which could be regarded as the earliest consciousness of public art. The real public art sprang up in the West in the 1960s. After World War II, in the reflective mood of the social problems such as the rising anti-war sentiment in Western society caused by war and the deterioration of environment caused by high industrialization, the Western art circles began to question the previous art forms at the same time of the revival. With the post-modern cultural trend of thought in Western society in this period, the public art with modern flavor began to develop formally.

Today, as the most important part of public artworks, the public's needs and lifestyle directly affect the way that the works are presented. Certainly, the development of science and technology art has changed the characteristics of traditional public art and broadened the field of traditional public art. In recent years, with the development of human-computer interaction technology and the change of artistic viewpoint, new media art has gradually become the focus of attention in the art circles with its special artistic language form. The art of interactive installation is one of the most dynamic artistic forms in the art which

uses new media technology, and it is an emerging artistic form. It is full of the energy of new media technology and art, and has a very unique audience participation, flexibility and autonomy. In recent years, as one of the expression forms of public art, the art of interactive installation has been very active, with many excellent works having emerged. However, the research on its definition, value and creative methods is still not perfect.

The characteristics of the art of public interactive installation

The art of interactive installation in public environment was born for the public. The original intention of public interactive installation art works was not only to decorate the urban environment, but also to show the cultural concept of the environment, to lead the trend of development and to enhance public aesthetic awareness. Historical events, humanistic sentiments, ecological environment and so on are common elements and themes of public interactive installation works. Excellent works can guide people, inspire people, and increase the people's sense of belonging to, identity with and pride of their own cities and countries.

The art of public interactive installation is not only to "express" the designer's views and feelings, but also to "listen" to the user's feedback of experience. Influenced by the concept of interaction, public installation artworks give first priority to the analysis of the user's basic situation, thinking mode and behavior mode in the whole process from the initial conception to the final stage of presentation. The completion of the works cannot represent the completion of the design task. The works can be called the complete interactive installation works only when they communicate with the public and breathe in harmony with experiencers. In the following, the author will, from the following perspectives,

analyze several characteristics that should be paid attention to when interactive installation works are designed and produced in the public environment.

(1) Publicness

As mentioned by Hannah Arendt in *The Human Condition*, "Anything that comes into contact with or enters into the stable relationship of human life immediately has a nature of being a state of human existence. That's why no matter what human beings do, they are always existing in a situation". Human beings create situations for themselves. These situations are always rooted in the environment of human growth and integrated into human life. It is impossible for the former to break away from the latter. So when an artist starts his/her creation, his/her creation and works bear both individuality and publicness.

Publicness can also be explained by such words as "generality" and "universal meaning", which is expressed in art as a characteristic of universal meaning precipitated in history. Public installation art is not the art that designers admire themselves. It is the most convenient way of communication between the public and art. It needs to consider the public aesthetics, the artistry of works and the local culture at the same time. In the process of creation, the relationship between personal style, public demand and public acceptance should be well coordinated. As a result, the creation of public artworks is more difficult than that of art galleries. In a word, publicness is the core of public art, and the works of minority people who are separated from society can never be called qualified public artworks.

(2) Site-Specificity

Notes on Sculpture: Part II written by Robert Morris in 1966 is usually regarded as a key expression of the principle of Site-Specificity at an earlier time: Artworks should be "separated from the relationship

of works, so as to have a relationship with space, light and the viewer's horizon". To understand the site Specificity of public installation art, we can first understand the field in the site of works. The term "Field" comes from the field theory. This theory is one of the main theories of social psychology studied by Kurt Koffka, a German American psychologist. It is a conceptual model of human behavior. He believes that every action of human beings is affected by the site of the action, which not only refers to the physical environment, but also includes the behavior of others and many factors associated with it. Koffka referred to what an observer perceives when facing an environment as "the psychological field", and the realistic environment that brings perception to observes as "the physical field". Different people have different impressions of the same environment and different perceptions of the psychological field. On the other hand, the physical field of the environment will also have an impact on the psychological field of human beings, which shows that the psychological activities of human beings in the environment are often the result of the interaction between the physical and the psychological fields. Only when people's experience and perception in the environment are realized, can a dialogue between people and public art be reached and a new relationship can be established accordingly. Installation artworks in a public context can be regarded as an ensemble of "psychological field" and "physical field" from conception to completion and display of the works.

(3) Narrativeness

Installation artworks in the public context, narration takes place in the space created by the works. The installation works designed by the artists themselves, even the surrounding environment of the site selected for the works, can jointly create a situation, and create the first scene of feeling, making stories come into being

here. This space is dynamic. The installation media materials, such as shape, material, lighting and sound, set up a stage for stories. On this stage, virtual space, material space and internal space intertwine and interact with each other, waiting for the audience (protagonist) to perform on it. Once the "narration" comes into play, the installation works will appear charming, vivid and natural. In order to create a narrative atmosphere for excellent installation works, artists should carefully study how to depict stories, express space, and shape time in artworks.

(4) Interactivity

According to Professor Roy Ascott, the pioneer of new media art, the most distinctive characteristics of new media art are connectivity and interactivity, which are most fully reflected in contemporary interactive installation works. This artistic form relies on the development of science and technology to provide more possibilities for the presentation of creativity and enables both creators and experiencers to experience a new realm. It breaks through the relationship between the author and the audience in the traditional art form, regards the visitor as an indispensable part of the works and emphasizes the enthusiasm, activeness and initiative of the audience. It requires the visitor to participate in the works and form a new viewing behavior by the means of audience perception guidance. Participants can also gain more hierarchical feelings through their own body movements and complete their works amidst interaction. This participatory mechanism promotes the integrity of conceptual expression.

As the matter of fact, the concept of interaction is very broad. The interaction between individuals and individuals, individuals and groups, groups and groups, individuals and works, works and works can all be called interaction. Interactive installations also have many forms. They mainly communicate with

experiencers by means of sound, electricity and light. They give feedback to the experiencers' body language. Therefore, the modeling can be static or dynamic, and can be touchable or untouchable. With the help of these media materials, human beings break through shackles of the real world and try to achieve richer emotional exchanges and more immersive virtual experience.

FEATURES AND FACTORS OF SOUND

Sound is one of the earliest physical phenomena studied by human beings. Until the end of the 19th century, only human ears were used to receive sound waves. As one of the frontier disciplines, acoustics has a long history and is still very active now.

Sound, an independent medium and one of five physical senses, provides us much information that visual sense fails to provide. The time when we hear the sound is shorter than the time we see something since sound can pass information in a very fast manner. Sound exists in the domain of time and goes beyond space while visual sense exists in the domain of space and goes beyond time. Sound is in an advantageous position in space because installation art is a kind of art that creates space. No matter which direction the user is facing towards, user can always hear the sound. Different sources of sound and varying sound volume can be adopted to help artists to create layering space.

In regard to the impact of sound art on public interaction installation art, it provides information and feedback for users, in turn users can participate in the two-way communication with installation work via receiving, cognizing and acting towards acoustical signal. The sound art applied in interaction installation art can be divided into phonetic element and non-phonetic element, the latter of which is

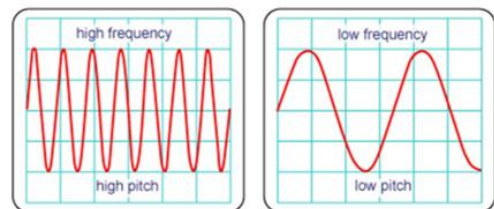
widely used in public interaction installation art. In other words, non-phonetic elements are mainly used for auditory information expression. Non-phonetic elements can be further divided into natural sound and artificial sound, and artificial sound can be classified into music, noise, industrial sound, living sound and so forth. The countless sound elements can be analyzed from the acoustic perspective once applied.

The three factors of sound, i.e. pitch, loudness and timbre, have a mutually corresponding relationship with the three factors in physical acoustics, i.e. dominant frequency, amplitude and audio spectrum.

(1) Pitch and frequency

Pitch refers to the sharpness of sound, which depends on the frequency of the vibration of sound source. The faster the vibration of an object, the greater the frequency, the higher the pitch, and vice versa(fig.1). The unit of frequency is Hertz, abbreviated as Hz. Only the regular waveform of sound can be felt by human beings, that is, only when the frequency of sound lasts for a certain period of time, can the pitches be felt by human beings. Discrete pitches can hardly provide much information. In installation artworks, too many meaningless discrete pitches should be avoided. However, human beings are sensitive to the change of pitch and can easily tell the difference of pitches between two sounds. Therefore, intermittent pitch changes can be used to transmit information over a period of time.

Fig.1. Pitch and frequency

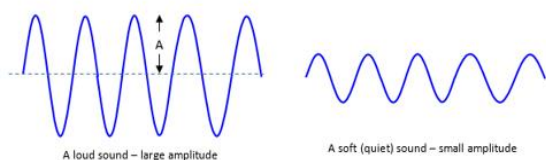


(Pic from Period Science Term)

(2) Loudness and amplitude

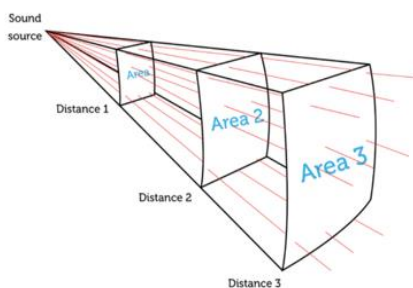
It refers to the size of the sound that the audience feels subjectively, also known as volume, which is related to the magnitude of the sound source and the proximity of the sounding object(fig.2). The greater the vibration amplitude of the sound source, the greater the loudness. On the contrary, the smaller the amplitude, the smaller the loudness. The closer you are to the sounding object, the louder the sound you can hear(fig.3). On the contrary, the farther, the lower. The use of stereo or surround sound can effectively map spatial dimension information. According to this characteristic of sound, adjusting and setting the loudness is just like injecting soul into the space created by the installation works, which can make it more vivid and real. In the design of installation works, we should not judge everything by experience. It should be adjust and test the size of the used sound according to the design theme and design site, so as to achieve the most appropriate effect.

Fig.2. Loudness and amplitude



(pic from school Physics)

Fig.3. Loudness and distance



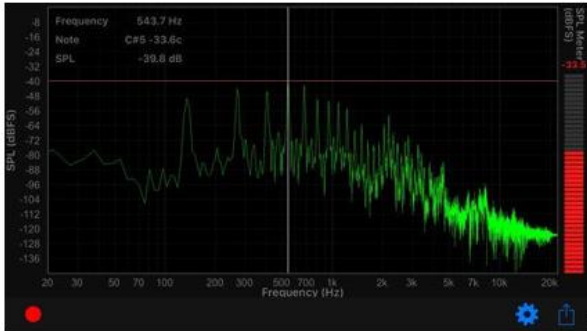
(pic from Physical Stack Exchange)

(3) Timbre and sound spectrum

Timbre refers to the different characteristics manifested by different sound frequencies in waveforms. Sound spectrum(fig.4) can indicate which frequencies of sinusoidal waves a signal is composed of, and can also show the size, phase and other information of sinusoidal waves at different frequencies. Sound spectrum is one of the factors that determine the timbre. It refers to the intensity of harmonics and overtones at different frequencies in relation to the basic frequency. The most clearly sound produced by the fundamental frequency of sound waveform is referred to as fundamental tone, and the sound produced by the tiny vibration of each harmonic is referred to as overtone. The sound at a single frequency is referred to as pure tone, and the sound with a harmonic is referred to as compound tone. Each fundamental tone has overtone with an inherent frequency and different loudness, which can distinguish other sounds with the same loudness and pitch. The proportion of each harmonic of sound waveform and the size of its attenuation with the time determine the timbre characteristics of various sound sources.

Timbre is a very important characteristic of sound. Different materials and structures of the sounding object would result in different timbres, which can provide numerous materials to meet the narrative requirements of installation design works. At the same time, timbre is also the most frequently used element of sound, because even discrete timbre can be easily distinguished by human beings, just as human beings can identify the instruments used by listening to discrete fragments.

Fig.4. A Sound Spectrum



Sound Design in Interactive Installation Art in Public Environment

As a matter of fact, 70% of the information that human obtains from the outside world is via visual sense while about 15%~20% is via auditory sense, thus the auditory sense is the most important way for human to obtain information in addition to visual sense.

Nature has not only created a variety of sounds, but also created human ears to listen to sounds. As an important sensory channel, human auditory system has unique physiological characteristics and has the functions of receiving, selecting, analyzing and judging loudness, pitch and timbre. The lowest sound intensity that can be heard by human ear is about 10^{-6}W/m^2 (sound pressure $20 \mu\text{Pa}$). At 1000Hz, the corresponding vibration displacement of air particles is about 10pm (=10-11m), which is only one tenth of the diameter of air molecules. The mystery of human ears is evident. Human ears can hear sounds of 20 Hz - - - 20000 Hz, and are most sensitive to sounds between 1000 Hz - - - 3000 Hz. It is sadly to admit that people widely believed that the auditory sense is of secondary importance, as a result, it remains in a very subordinate position in design.

As mentioned previously, sound, light and electricity are major media materials used in installation art works.

Nevertheless, study on sound elements in the domain of installation art is still in the original stage. It is quite common for artists to adopt a piece of music so as to make the installation art work more appealing or use the sound as a prompt to ask users to have a look. There are also some works in which sound elements are used as the major element. In an installation work released recently, the artist creates a black space which enhances users' auditory sense while significantly weakens their other sensory senses. In the black space, users are allowed to enjoy the music or audio materials provided by the artist no matter they are lying or seated (fig.5). This kind of installation art work, as an exhibition art, certainly has its brilliant points, which however is not advisable in public installation art. Such design pattern disconnects sound from other media materials, and it is the same mistake as neglecting sound while focusing on visual elements only.

Fig.5. Sound experience display



(pic from Lynn Look)

In addition to these physiological features, sound possesses some interesting advantages in terms of human psychology and even the cognitive domain of acoustical signal.

(1) The detection speed of acoustical signal is faster than that of visual signal.

With regard to the acoustical signal and visual signal released at the same time, the acoustical signal is always received before the visual signal. Visual information accounts for most information that human receives every day, thus human is more sensitive towards the stimulation of visual signal. Utilizing visual signal to guide acoustical signal can improve the accuracy of the information that user receives.

(2) Human is sensitive towards changes of sound as time goes by.

Sound is a time-related information carrier and passes information via constant changes as time goes by. If the parameters of an acoustical signal remain unchanged for a long time, then human will soon have auditory adaptation, be less attentive toward this signal. If a sound varies as time goes by, human will be very sensitive towards the sound.

(3) The omni-directional feature of acoustical signal can be used to guide user to focus on details via visual sense.

Acoustical signal can be utilized to help visual sense to capture information, human get used to further reading and analyzing from visual perspective after hearing acoustical signal.

(4) The collaboration of visual and acoustical information provides human much stronger sense of real experience.

In the context of the booming development of new media art, all kinds of media materials emerge like the mushrooms and provide users all-around information support. The next aim for most designs is to provide immersive experience for users. Visual and acoustical

sense, as the first and second information source for human respectively, supplement each other, their collaboration can bring users much stronger sense of real experience that can be compared to real world.

(5) Sound has cultural and regional feature.

The cognition of human of different nationalities in different areas towards acoustical signal varies because of diverse historic and growth environments. Everyone has his most special sound he remember, and he and the people around him can be touched or recall some sound together. Artists can create public or individual space for installation art work by using the cultural and regional feature of sound.

(6) Sound is emotional and can pass different emotions.

Sound is a very pure element and influences human's emotions via subconsciousness like color. For instance, light value and high hue contrast is clear and bright, which can be used to express lively and cheerful emotions. Medium value and high hue contrast is similar to smooth and soft rhyme, which is suitable for relaxing and comfortable atmosphere.

(7) Sense of rhythm can be used for more efficient narration

Sound of different rhythm and diverse melody can express different emotions and feelings. There is a saying that "music has no boundary". Unrestricted by language and visual signal, sound is one of the arts that are the most accessible to human mind. Applying sound elements appropriately can significantly improve the narration feature of the work. Along with the economic and cultural development, government and the society are working hard to make the visually disabled to live as average person does. Equipping installation art in public environment with sound element enables the visually disabled to experience

together, which also improves the public character of public interaction installation art.

CASE STUDY

(1) Touched Echo

There is a 500-meter-long terrace which is called “Terrace of Europe” in Brühlsche Terrasse. Standing there, it’s a bird view over River Elbe and the old town across the river. On handrails, there are some humble sticking marks showing an outline of a figure covering ears with elbow on handrail and a serial of numbers, 13.2.1945(fig.6). When imitating this posture, an experiencer will be haunted by the ghosts from the war decades ago.

Fig.6. Terrace and Sticking Marks



Bone conduction(fig.7), a method conducting sound is applied to this installation. The conduction pathway is “sound wave, cranium, bony labyrinth, lymph fluid in internal ear, organum spirale, acoustic nerve, and acoustic center at cerebral cortex. The principles of bone conduction can be explained with a simple example. When we cover ears with hands, we can clearly hear our own whisper in a voice no matter how low it is. With bone conduction, sound will not be spread in air so people who do not touch the handrail can hear nothing. In this unusual way, German artist, Markus Kison represented the horrible atmosphere caused in Bombing of Dresden on February 13th 1945. The name of this installation is named as Touched Echo. Markus

explained people who touch the installation will become involuntary participants. All these participants will cover their ears and bend their body, looking like escaping from the air attack, explosion and terror howl. The harder their palms press, the clearer the sound will be.

Fig.7. Bone conduction



The collision between the sound of air attacks and explosions heard when covering ears and the beautiful scenery through the bleak handrail makes people feel absurdly unreal. The terror against wars is common among people. This immersive experience created and produced by stripping a space from the real environment is brought by the sentimental narratives of sound.

The sounds of air attacks, explosions and heart-wrenching howl are all noise. However, noise can also be taken as a major sound element to create excellent works by different themes.

The artist was invited to create a special work of Osnabrück for 2009 European Media Art Festival in Osnabrück(fig.8). Same as Touched Echo, the mark shows the date of the first air attack in Osnabrück during the World War II, 20.6.1940(fig.9). Located in a bridge in Osnabrück downtown, the installation is towards the direction of air attack.

Fig.8. Touched Echo Osnabrück (2009)



Fig.9. Sticking Marks of Touched Echo Osnabrück (2009)



History is a process everyone can take part in. Real events can be used as the material for installation arts. Even without experiencing the event, experiencers may also call for the objection against war from their heart through the silent mourning for victims in this installation.

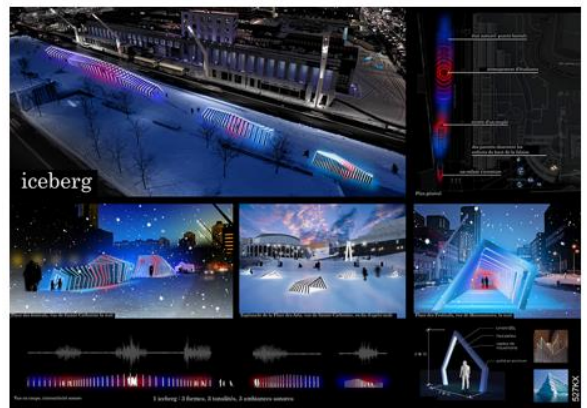
(2) Iceberg

Iceberg, an interactive public installation with architecture, light, and sound as major design elements is created by a design group, ATOMIC3. This

installation was exhibited in Quartier des spectacles, Montreal, Canada.

As its name shows, from north to south, the work is composed of four huge illuminating arched installations in triangle shapes with unique sound emitting. A tunnel is formed under the arched installations, attracting experiencers feel the birth and melting of icebergs from the waters in the Arctic Pole to the southern coasts. When entering into the installation, the motion sensors inside will detect the experiencers to trigger the changes in lights and sound (fig.10).

Fig.10. Iceberg



The installations of icebergs in any shape and size may remind people about the glaciers floating and gradually melting in the water. After hundreds of years, icebergs may emit unique sound with time and environment changing. In the north, under the biggest iceberg, the movement of experiencers can trigger the light and sound on. When sea water flows into cracks, a huge sound similar to organ may occur. When floating further to the south, the icebergs melt intensely and get closer to the coastline with residents. Thus, the sound turns from meaningless to that like music. The installation is a small-size one which is only fitted for children(fig.11). It

warns the coming of global climate change and asks people to protect the environment.

Fig.11. Installation changed



In this public installation, the sound design creates a layering space, making experiencers have an immediate association. From the natural sound to artificial music, this work describes a story of iceberg melting. Moreover, the application of lights gives participants an experience with stronger reality.

(3) Piano Stair

With the city development, congested traffic has become common in the middle- and large-scale cities all over the world and the general lack of exercise among people in cities also becomes a public problem. To help citizens lacking in exercise and relieve the visitor flow in escalators, governments want to encourage people walk by stairs.

As shown in pictures, to improve the behaviors of the public, many countries have launched this series of public installations. In metro stations and shopping malls with heavy crowds, the steps for walking are designed as piano keys in the long and boring footsteps. These steps are equipped with infrared induction system or pressure sensors. When walking on the stairs, people press a piano key when making a step, making the stairs emit light and music(fig.12). This installation greatly improves the utilization rate of stairs and relieves the traffic pressure while encourages many people to make more movement.

Fig.12 Piano Stairs in subway station and shopping mall



(Pic from google)

In fact, there have been more and more works focusing on and reflecting the living ecology. Humanity or ecology are hot themes in public installations. The piano stairs are designed with the public experiences in cities, increasing its publicness. Moreover, this simple design has characteristics of interactive installations, including public participation, interactive feedback, dynamic variation, and visual pattern. With appetency and attraction, this edutainment method can subtly convey the ideas for public benefits and motivate the ecological awareness.

(4) Sound Fun

The pigeon whistling in the sky, the vendor's hawking nearby or in distance, bells of old bikes passing by in the old times... The sounds of the old Beijing disappearing in recent years reoccur in Dashilan of Qianmen, Beijing through a sound installation Sound Fun by the designer, Qin Siyuan.

In this work, the sound fragments occur randomly. Each fragment is like a small complete play. The sounds in four seasons are different, vividly depicting the culture of street vendors in old Beijing. The shouts of street vendors can be heard in spring, the shouts for smoothies selling be heard in summer, the pigeon whistling be heard in autumn, and the camel bells be heard in winter. However, all these sounds have changed. They appear in the public environment of Beijing Fun in Qianmen. Inbuilt in the benches for rest, the sounds

become a part of public art plan in Beijing Fun(Fig.13). In this installation, visitors can acquire an intangible comprehensive experience once upon entering the area. The indistinct sounds are extracted and designed as the abstract background sound(Fig.14). Played discontinuously in a limited volume, the sounds are not abrupt but make subtle changes to the space in the area. By controlling the sound continuity and space positioning between different tracks, the installation pulls audiences back to decades ago with misty sound and make them in a living theater of sounds hiding in the time.

Fig.13. *Sound Fun* in Beijing Fun



When talking about Sound Fun, Qin Siyuan said, “sound is one of the most humane presence through which we can explore our emotions and record the ages. In time, it’s the past, the present and the future, composing the common memory of people.”

Fig.14. Played discontinuously in a limited volume



(Pic from sina.com)

With sound as a medium, Sound Fun creates a living sound theater traversing space and time with the shouts of street vendors in the old Beijing as the major element with the percussion and natural sound as supplementary. This installation brings unique perceptible and sentimental experiences by representing the culture of street vendors with sounds in Dashilan, a 600-year long commercial district of Beijing.

The impact of sound design in interaction installation art is firstly reflected in the subject matter and work feature of interaction installation art. In most cases, interaction installation art exists as experimental art or technological art as it is still in its starting state, and it is always on exhibition in galleries, art museums, art galleries, exhibition centers and other official institutions. In addition, what interaction installation art shows is artistic concept and technology experience. At the very beginning, interaction installation art was merely artistic work and focused on personal emotion expression and technological experience. Along with the development of sound art, interaction installation art became applied design with practical social functions and could be adopted to solve practical problems. Even though that installation art became known to the public and the access to interact cannot be credited to the application of sound art, it is undeniable that sound art makes the content and nature of installation art different.

CONCLUSION

Through theoretical research and case analysis, first of all, we can know what kind of works deserves to be called excellent works on the premise of facing the public in the subject matter of installation design with sound as the design element. They should be marked by

the coexistence of form and content, and the unity of function and aesthetics. They should possess a strong spiritual power and a tough soul, reflecting the internal relations and development status of society, economy and humanities, providing participants with complete narrative space, natural feelings and spiritual and physical interaction. The application of new media in the field of interaction has changed the concept of traditional artworks and brought more possibilities for the interpretation of excellent works. Different media means are bound to have direct or indirect impacts on artworks. Actively speaking, sound design acts on the artworks of interactive installation in the public environment, fully taking into account human nature, with a strong scientific and technological sense, and an obvious digital, interactive and immersive nature, showing the infinite charm of the combination of art and technology, redefining the relationship between experiencers and the public installation art. Experiencers are guided to think about the ideas the works want to express, and to think about the relationship between man and man, man and nature, man and environment, man and society, man and the world.

Passively speaking, sound design acts on public installation art, making the dialogue between works and experiencers more natural and real, producing more contingency and interest, and changing the current repeatability and absoluteness of some experiential designs. This trend of change makes the public gradually become a part of the design works, and change from experiencers to participants. And because the response to sound is a natural instinct bestowed upon human beings by Nature, the communication between participants and works is made more direct. Without any instructional guidance, participants can enjoy participating in art. The experience of

participating in art also indirectly improves public aesthetic consciousness.

Public art of interactive installation is not completely equivalent to public art. Generally speaking, it only has a short-term display function. Unlike other public artworks, it cannot be preserved for a long time. Art is constantly changing. The artistic ideas, concepts and aesthetics are different in different periods. Throughout history, with the development of society, social problems would inevitably emerge endlessly. Hotspots of public concern are constantly shifting and changing. This is the normal situation of the development of human society, which is unavoidable. With the rapid development of science and technology, new media materials are constantly being studied and invented and the devices which provide better experience for human beings are being updated at a very high speed. However, the history precipitated in sounds, and the culture, emotion and spirit contained in them would not fade easily. Therefore, under the action of sound design, as long as the sound elements of public installation artworks are changed and adjusted, brand-new emotional feelings can be brought on the premise of the retention of the concept of works and the maintenance of the common experience. An infrequent flow display can come into being.

But unfortunately, in terms of the works that have so far emerged, there are still few installation works which take sound design as the main element. In the practical application of sound elements, there is also a tendency that some design elements are separated and go their own way. In particular, the whole Asian circle is still in the exploratory stage, failing to show a clear picture. I hope that, in the future, more artists and designers will pay more attention to the "thickness" and "weight" of the sound element, and combine the sound design with the design of new media, so as to create more

excellent public installation works for human society.

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HOW ART OF TEACHING CAN DEVELOP IMPACTFUL ENTREPRENEUR

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ABSTRACT

The aim of this paper is to discuss how to nurture the mind of budding entrepreneurs using the art of teaching and help them get efflorescence of business ideas. Art is a perfect package which teaches creativity but is also about collaboration, critical thinking and problem solving in connection with varied cultural influences. Art based learning for business provides a crucible for creativity, innovation and transformation and also emerges as viable approach to enhance entrepreneur skills. Businesses are looking for solution, and art-based learning can help because of dramatic changes in market, technology and global competition. Relying solely on logic, analysis and problem solving skills is insufficient in today's rapidly changing environment. Artists and business leaders have many parallels, both have a guiding vision, a potent point of view, formulating an idol, navigating through chaos and finally producing a new creation. Art is a medium of expression, and nobody can replace that expression from the mind of learner. Only a mentor can harness the science of learning, to illuminate the mind of the learner to discover themselves. A mentor will ensure that the learner is able to identify what excites them in life, things for which they have a passion and are most happy doing. They encourage the learner when they faultier and fail this empowers them in taking difficult decision later in life which are a pre-requisite of a successful businessman. Art of teaching

can be summarized by I CAN, I WILL, I PROMISE

Keyword: skill development, intercultural communication, practical approach, transmission, opportunity

INTRODUCTION

There is a wealth of contemporary research focused on art of teaching or how to build a successful entrepreneur but our study focuses on how art of teaching can develop impactful entrepreneur by applying Art based learning which helps in skill development. This study discusses how a teacher awakens the natural curiosity and creativity of the young minds and convert into a big discovery by changing the traditional teaching methodology and introducing art-based learning to the young minds so that they are ready for today's business world. Albert Einstein said – "Education is not the learning of fact but the training of the mind to think". What the young mind is thinking, that really matters in today's world as we all know that they are futuristic and as a creative developer, we should develop creative thinking because true learning only happens when a teacher discovers what truly matters to his/her student. Successful teachers should practice an art form that requires craft, sensitivity, creativity and intelligence and should able to express their trust in students. Teacher should be willing to invite students into their intellectual curiosity, makes ways to draw student

attention and be sensitive to their human emotion.

Art is a potent catalyst for dialogue, reflection, and can be a process for self discovery. Teaching is a sky full of stars, as a creative developer we should develop creative mind and the power of creativity and moving an idea through the process of innovation to reach a final result—be it a business, a product, or a social movement. At the beginning of every venture is an idea, which is why the innovative process begins with creativity. When an idea for something new is combined with a meaningful purpose, creativity rises to the level of innovation. The process of innovation doesn't begin with entrepreneurship, jumping straight into design thinking doesn't provide the foundation needed to develop key skills. Some problems that the entire world is facing can only be solved with innovation and passion. This is where we need young entrepreneurs, not machines.

LITERATURE REVIEW

The literature review focuses on the many variables – art of teaching and importance of it, Art based learning –how it helps in developing entrepreneurship learning, what are the non-cognitive skills which need to be developed to be a successful entrepreneur.

Art of teaching

If art is human expression about the world, then teaching is human expression about the unfolding and ever-changing ways that we think and learn about the world. This art must be relational, for the ways we learn about the world cannot be pointed to and dissected, but only embodied and experienced: patience, empathy, collaboration, awe, and transformation. The Art of teaching thrives through a kind of expressive personality. When instructors reflect on

the ways they have handled challenging students or situations, they can identify the instincts and reactions they most wish to cultivate or eradicate. Like writing, teaching can be taught, mentored, and made into principles; but its actual expression will always have an individual style, a personal approach, a unique coalescence of practices that cannot be replicated by others. In many ways, the art of teaching develops naturally as a teacher allows experience, mistakes, and successes to form and reform their approach, and cannot be summarized easily. However, a variety of practices can help teachers articulate their particular approaches, beliefs, and habits that comprise an art of teaching.

Art of teaching is based on 5c's which helps in improving the teaching learning process and makes it more purposive. It tries to discuss the concept of teaching, analysis of teaching process, and relationship between teaching and learning.

5c's of art of teaching

1. Critical Thinking - It's a process of filtering, analyzing and questioning information and content found in various media, and then synthesizing it in a form that has a value to an individual. It is the ability to take information and put it to use to create solutions.

2. Collaboration - Collaboration is a skill of utilizing various personalities, talents, and knowledge in a way to create a maximum outcome. The outcome must provide a benefit to the entire community or a group. Due to synergy, the common outcome has a greater value than a sum of values of each individual outcome. More collaborative learning means more emphasis on cooperation.

3. Communication - Communication is a skill of presenting information in a clear, concise and meaningful way. It also designates careful listening and articulating thoughts. Communication has various purposes:

informing, instructing, motivating, and persuading

4. Creativity - creativity is one of the most important characteristics of being human. It is one of the main traits that make us successful as individuals create something new or create something in a new way, utilizing the knowledge has already acquired. It does not just signify art, but also various solutions to a problem in real life situations.

5. Culture - It associates the individual to all that surrounds them: art, drama, dance poetry, history, science, religion, written and unwritten language, technology and the individual themselves.

Today's generation is the "I" (internet) generation! Learners today are experiencing a digital childhood filled with smart technology, tablets, the internet, and social media. The majority of the youth have access to many forms of current technology, both at school and in their homes, and are amazing at media multitasking. So, as 21st century educators we should focus on student key skills as well as we need to understand how we trained them to contemplate and do their introspection so that they develop the business skills. There are some common views of what constitutes teaching:

- Transmission is the process by which information, knowledge, ideas and skills are taught to others through purposeful, conscious telling, demonstration and guidance. Historically this is the most traditional and, currently, the most predominate method of instruction. While teaching as transmission reflects more behaviorist learning theories, teaching as transaction is rooted in more constructivist perspectives. In this view of teaching, a well-worded explanation is seen as having the most impact on student learning. While this mode of teaching is still highly regarded by both students and instructors.

- Acquisition is the conscious choice to learn. Material in this category is relevant or interesting to the learner. This method includes exploring, experimenting, self-instruction, inquiry, and general curiosity. Because acquisition implies an emotional commitment on the part of the learner, it is a more effective process than transmission.

- Accretion is the gradual, often subconscious or subliminal, process by which we learn things like language, culture, habits, prejudices, and social rules and behaviour. We are usually unaware that the processes involved in accretion are taking place, but this method accounts for a large number of things humans know and do. Social learning and modelled behaviours as they are passed on and imitated certainly play into this type of learning, as does the hidden or covert curriculum.

- Emergence is the result of patterning, structuring, and the construction of new ideas and meanings that did not exist before, but which emerge from the brain through thoughtful reflection, insight and creative expression or group interactions. This form of learning accounts for the internal capacities of synthesis, creativity, intuition, wisdom, and problem-solving. This method is greatly dependent on the allocation of time, and opportunities to reflect and construct new knowledge. Emergence plays an important role in inspiration and originality. If we (educators) stick to old methods without trying something new, we will not succeed and at a certain point it is important to stop, look back and evaluate the experience. There is a question that always strikes in most of our minds – what today's educators need to develop successful entrepreneurs?

Exposure to diversity in thought and behavior

Today's teacher is more of a facilitator than a lecturer when it comes to cultivating learning practices. Educators who ask open-ended questions inspire thoughtful responses and encourage student thinking, reasoning, and reflection. Teachers meet learners from different background and perspective which breaks assumption expectations and expand thoughts and having diversity in perception will creative problem-solvers.

Facilitates Student Focused Learning

Problem-based learning helps to develop creativity and the ability to think critically. A good educator knows that knowledge is not the aim, Teachers should adopt the principles of individual differences.

Embraces Leading-Edge Technology

Teachers all around the world are able to develop and share innovative ways of learning with the help of technology—they can create visual and interactive learning environments for students who live in rural areas and remote parts of a country.

Prepare them for real Life

Today's educators not only prepare students for life-long learning, they model a life of endless learning. There are dynamic examples of learning that does not end at graduation. Teachers have to encourage students to question all information and to associate it with their background knowledge. There are everyday strategies that help to develop the skills needed for an entrepreneur world.

Experimental learning

Successful classrooms are ones in which learners are engaged through the educator's use of a combination of content knowledge, pedagogical knowledge, and technical know-how. The process of learning should be creative and captivating; hence teachers have to take advantage of educational innovations in

order to keep abreast with recent developments.

Art based learning

Art based learning is an approach to learning, using the arts as a pathway to explore non-art topics such as leadership, change, and innovation in business. Artists and business leaders have many parallels. Both involve having a guiding vision, a potent point of view, formulating an ideal, navigating chaos and the unknown, and finally producing a new creation. An artful leader must know how to lead people creatively. Since all great art pushes boundaries beyond established norms, it can teach us about leadership, change, courage, and creativity. It makes sense therefore to learn principles and practices from the world of arts and apply them to business. It helps us how to use a new nonverbal language and vocabulary that is found in the process of art, and that allows a deeper collaboration of mind and body, that words alone cannot achieve. Arts-based learning for business provides a crucible for creativity, innovation and transformation. Artful reflection helps us identify patterns, decode complexity, seek new perspectives, and enables a deeper inquiry into matters of importance in our lives and companies. The goal of art-based learning is not to teach people to be artists but to create immersive learning experiences using artistic processes to help people gain new insights and perspectives about business challenges.

The arts are emerging as a role model for business to adopt. Through art, we can make it safe to ask the deeper questions that lead to the emotional truth about a situation. Businesses are looking for solutions and arts-based learning can help in the following:

- Team development
- Strategic planning

- Values creation and meaningful work
- Appreciative inquiry and leading change
- Creativity and innovation skills development
- Leading change
- Inspiring, engaging and motivating employees

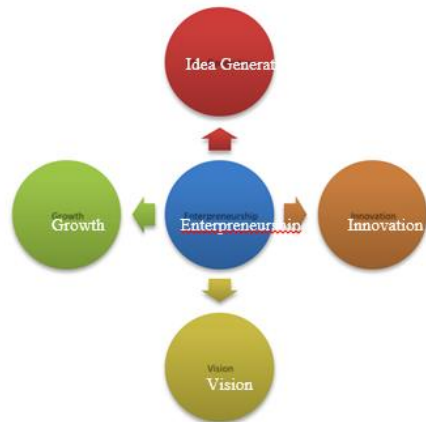
Entrepreneurship

A first objective is the development of a broad understanding of entrepreneurship, and of the role of an entrepreneur in modern societies and economies. Entrepreneurship is all about transforming the world by solving big problems. Like initiating social change, creating an innovative product or presenting a new life-changing solution. In the 21st century, an individual must be able to create something new or create something in a new way, utilizing the knowledge he has already acquired. It does not just signify art, but also various solutions to a problem in real life situations. A successful and sustainable business requires entrepreneurship and innovation. Entrepreneurship is a mindset an attitude and taking a particular approach to doing things and often requires creativity, innovation while addressing a new opportunity or concern in a new way. An entrepreneur is an innovator, as starting a business generally requires business concepts, ideas, service, new technology, People for support, a process by which service or product will be delivered, money to run all activities. to fulfill all these things, we require entrepreneurship education. Entrepreneurship education also provides budding entrepreneurs with the skills and knowledge to come up with business ideas and develop their own ventures and this includes helping them to learn about core business areas.

Entrepreneurship benefits students and learners from different social and economic backgrounds because it teaches people to cultivate unique skills and think outside the box. Moreover, it creates opportunity, instills confidence, ensures social justice and stimulates the economy. “As an entrepreneur, you do all those things. If you have the opportunity to acquire those skills, you going to be more valuable in the workplace”.

The primary focus of entrepreneurship education is on

- How to start a business including the key processes of business start-up
- How to plan and launch a new business venture, enhancing the necessary skills and behaviours needed to run a business
- The deployment of entrepreneurial skills and knowledge in a business context
- Imminent use of the knowledge and skills needed to start a business;



What entrepreneurs need most of all above - motivation, focus, hope, financing, marketing skill and a brilliant idea. The one thing all successful entrepreneurs have in common is the desire to make their idea a reality.

Other than desire an entrepreneur also needs the following.

1. Passion, Perseverance & Persistence:

Passion is a strong and barely controllable emotion that culminates into something that is almost always bigger than the person carrying it within himself/herself. Perseverance is a rather mature emotion. It's not really found in the novice. It is that silent magic ingredient that makes all the difference in winning and losing. Persistence is the sail that will pull an entrepreneur through the toughest of storms. Being firm on your path even in times of utmost difficulty is the hallmark of a leader.

2. Big Dreamer:

What further strengthens an entrepreneur is their ability to dream and see the larger picture. It is literally the very first step that sets them on a path to self-discovery.

3. Learning:

Learning should never stop irrespective of your age and hence arming yourself with education plays a vital role in transforming you into the leader you want to be.

4. Good Listener:

Any person will only be able to contribute if they first learn to absorb. However simple it may sound, but the ability to truly listen to customers and employees is not something that comes easily to all. It is this very skill that becomes the polestar of a long-term growth. The people who work for you

should look up to you for inspiration and hence as far as work ethics are concerned, no compromise is acceptable.

The 3 p's of Entrepreneurship



Passion -

If there's no passion, there are high chances that you may give up easily.



Perseverance -

Nothing happens overnight, be patient till your business reaches its peak.



Persistence -

You may fail at first, but persistence is what will ultimately lead you to success.

Importance of Intercultural communication in a Business

Intercultural communication is a symbolic, interpretive, transactional, contextual process, in which people from different cultures create shared meanings. The need for effective intercultural communication can be found in all aspects of a business, from internal communication to marketing and advertising. Effective global communication allows workers from different cultures to work together as a group. It is commonplace to do business with people from all over the world. Whether you're dealing with manufacturers from another country or building an office on a different continent, it's important to be aware of the cultural norms of the people around you. Culture also involves the psychological aspects of your expectations of the communication context. From the choice of words (message), to how you communicate (in person, or by email), to how you acknowledge understanding with a nod or a glance (nonverbal feedback), to the internal and external interference, all aspects of communication are influenced by culture.

METHODOLOGY & APPROACH

Around the world parents and business leaders are asking the same question - what are the skills needed to for a child to become successful entrepreneur. What skills they need to cultivate in a rapidly, changing world? In the process of innovation, entrepreneurs are the individuals who pull everything together and lead the action. Learning entrepreneurship is very different from learning anything else. The very concept of this study is to help the students identify their strengths and talents and to work on improving them. In real-world examples, we can see many successful entrepreneurs who were very bad students in their time. Both Mark Zuckerberg and Bill Gates are college dropouts and look at them now. Through their leadership skills, they activate, focus and accelerate the journey to the desired outcome. According to Dr. Laura Jana (Paediatrician, educator, author, and health communicator) skills are divided into two categories which are helping learners to find purpose and cultivate personal success.

1. Hard skill or traditional skill - IQ skill which includes – reading, writing, arithmetic.

2. Soft / Social and creative skill QI (key) - which includes - creativity, communication, collaboration, critical thinking along with great leadership and adaptability.

It is also called soft or non-cognitive skills that are gaining prominence in playroom, board rooms and classroom around the world. we can also call them QI (key) skills the reverse of IQ. QI skills represent a new set of skills deemed absolutely necessary for success in today's rapidly changing world, with far-reaching implications for education, business, innovation, and economics.

1. Me skills: those skills pertaining to the self, such as self-control, introspection, self-management and self-awareness.

2. We skills: These focus on working with others, like communication, teamwork, and empathy.

3. Why skills: This set focuses on fostering curiosity, teaching them questioning and looking for understanding.

4. Will skills: a can-do attitude, motivation is the goal of these skills, aiming to encourage and determination.

5. Wiggle skills: intellectual restlessness, wiggling is thought to power the Will and Why, by giving the free reign to explore and channel energy into passions.

6. Wobble skills: This is all about recovery; skills that teach to come back from failure and learn from it.

7. What If skills: possibility skill, defined by imagination, creativity, out of box thinking, passion, how it should be.

Apart from the QI (key) skill there are some activities which Nurtures Personal Growth and Development and help to teach entrepreneurship -

1. Turn class participation into speaking events

Instead of standard class discussions, give students a chance to practice public speaking. Teachers can make this shift by integrating Ignite Talks or pop-up debates. These work in any subject area. With these activities, kids feel positive pressure as they speak to an audience. Entrepreneurs do this when pitching to investors or speaking to customers

2. Introduce project-based learning (PBL)

When entrepreneurs launch a startup, they often begin by attempting to solve a narrowly-defined problem. Teachers can launch a PBL initiative that empowers

students to define real-world problems and create solutions for those problems.

3. Work with authentic tools and platforms.

There is a flood of communication and classroom tools geared towards students. Tools, which often have a narrow use case confined to the classroom, shelter students from the authentic digital world. Free services like WordPress, SoundCloud, YouTube, GoFundMe, and Instagram, however, are used by entrepreneurs to establish platforms and grow audiences. By using these same tools in a lesson or project, students can practice the same methods that modern entrepreneurs use to share their work with the world.

Not many students will launch a startup from their classroom. But with the right mindset and a few well-chosen strategies, teachers can help students develop the skills they need to succeed in our increasingly entrepreneurial world.

Apart from the above activities we can also conduct some class exercises to develop the perception, passion, design thinking skill, idea generation, will power and confidence in the learner.

Exercise 1

To understand the power of art –collect students into a room and showed them a picture of abstract art done by great artist and asked them “what do you see?”

They will come up with different answers as their imaginations are different. After having a discussion with them point out the detail and concept in each picture. By doing this quickly they learned that looking at something with different people can provide more points-of-view and discoveries than looking at something alone. It opens up opportunities for creativity and also shows the collaboration and cooperation which is very important part of - art of teaching and also helpful in entrepreneurship.

Exercise 2

To understand the power of confidence, self-awareness and self-motivation ask your students to create a tower by using building blocks. The tower building exercise challenges one to build a tower by putting one square block over another and achieving the maximum height possible till the tower falls down. Ask the students to set goals for themselves i.e. how many blocks can they use before the tower collapses. Once the goals are set, a student who had their target is called to the dais to build the tower. At a later part of the exercise, one of the students is blind folded and is asked to build the tower with their non-dominant hand while two other students guide in building the tower. Students are asked to re-assess their goals. After that there might be shift in the target of student. By completion of this exercise students will get an experience that these were not preferred in an organization as the organization shouldn't lower its targets despite the hurdles that comes in its path and should strive it best to achieve the target.

Exercise 3

Third exercise is based on following the instructions. This is a quick fun activity with a little trick to see how many of the participants will actively listen and follow the one single instruction.

FINDINGS AND DISCUSSIONS

Teaching is more than a job. It is a responsibility - one of the greatest responsibilities in civilized society. Teachers lay bare the mysteries of the world to us. They train our minds to explore, to question, to investigate, to discover. Learning requires consciousness and the capacity to utilize what we know and leads to change both in what and how we know. Most researchers divide teaching methods into two categories: traditional methods - typical of conventional education, and innovative

methods (more action based) typical of entrepreneurial education. Art based learning identifies a range of cognitive capacities engaged in and nurtured by the teaching art including focused perception, elaboration, problem solving, and elements of creative thinking including fluency, originality, and abstractness of thought and also how engagement with the mentioned activities affects students thinking skills, dispositions, and inclinations to work with complex ideas in a way that prepare them for future opportunities to learn new information, invent, collaborate, and otherwise engage in productive activities on the basis of our Findings - arts-based learning can combined with whole-brain creativity and design thinking to improve the creative skills. Creative students are not afraid of change; they are more confident and flexible. Using imagination, they can find new ways of solving different problems and are able to memorize information without the need to cram their minds. They can easily make connections and look at usual things with a fresh eye.

We hope this may help to advance further conversations and research, not only about entrepreneurship training, but about The knowledge that emerges from art of teaching with art based learning and the effectiveness of entrepreneur skill that aim to help “not just to survive, but to be successful. Because learning is a process of confusion to conclusion.

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INVESTIGATIVE STUDY ON THE IMPACT OF GENERATION Z TO THE IMPROVEMENT OF THE MARKETING STRATEGY OF PREMIUM LEVEL FASHION BRANDS IN COLOMBO

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ABSTRACT

Generation Z, who was born immediately after the millennial, between 1995-2010 will represent a higher percentage of consumer spending and their needs and wants will directly influence the marketing strategy of fashion brands. The main objective of this research is to find the consumer needs of generation Z and how it will influence the marketing strategy of the premium level fashion brands in Colombo and to give suggestions to improve. The study is based on both quantitative and qualitative methods. In conclusion, the research will provide suggestions to improve the marketing strategy of premium level fashion brands in Colombo in order to increase sales by catering to the needs of the generation Z cohort and providing customer satisfaction.

Keywords: Generation Z, Marketing Strategy, Premium Market, Fashion Brands

INTRODUCTION

This research discusses how the needs, wants and the lifestyle of the generation Z

will influence the market strategy of the premium level fashion brands in Colombo and how they can improve their strategy accordingly. Here the discussion will be only focusing on a particular group from 15-25 years who lives in Colombo. Born immediately after the millennials, between 1995-2010, generation Z are the first generation after World Wide Web making them the first true digital natives. With 92 per cent online daily and 24 per cent online constantly they went from playground to plug in short time (Beall, 2016). In the coming years generation Z will represent a higher percentage of consumer spending. For the fashion brands to sustain in the market they will have to start looking in to this and understand that they are not like the Millennials at all. Generation Z will be a higher percentage of the consumer spending all around the globe including Sri Lanka. Therefore the Sri Lankan fashion brands will have to change and improve their marketing strategies, focusing on the generation Z to cater to their needs, in order to survive in the market. This study will discuss the marketing strategies of the premium level global fashion brands such as H&M, Zara and Forever 21, which are popular among the generation Z, how they are focusing on

the consumer and catering to their needs and will give suggestions and improvement for the premium level fashion brands in Sri Lanka such as Kelly Felder, GFlock, Cotton Collection as how to improve their strategies in order to gain the customer satisfaction by providing for the needs of the generation Z consumer. Here the research will focus on the marketing mix as for the marketing strategy, which refers to the 4Ps where the discussion will be based on Product, Price, Place and Promotion and how it will be influenced by generation Z.

Problem identification

In the coming years generation Z is bound to represent a higher percentage of consumer spending globally, including Sri Lanka. Therefore fashion brands have to pay attention to the needs and wants of generation Z in order to survive in the market. The main problem here is, how should the premium level local fashion brands react to the influence of the generation Z? They need to improve their marketing strategy focusing more on generation Z where eventually they would be able to increase their sales by bringing customer satisfaction, through identifying the needs of generation Z consumers. This study will analyze the needs of the Sri Lankan generation Z consumers with the marketing strategy of the global premium level fashion brands, and will give suggestions to improve the strategy of the Sri Lankan premium level fashion brands in order to bring customer satisfaction for the generation Z.

Objectives

1. To give suggestions to improve the marketing strategy of the premium level fashion brands in Sri Lanka.
2. To identify the consumer needs of generation Z to increase sales through customer satisfactions by catering to the needs

Significance of the research

This study will be important and a benefit for the premium level fashion brands in Sri Lanka as there is a really high potential of generation Z becoming the highest percentage of the consumer spending. And in order to sustain in the market, fashion brands will have to start focusing their strategies on generation Z. As this research investigates the needs of the generation Z in Sri Lanka and provides suggestions as to how to improve their marketing strategies accordingly, it will be very convenient and a major benefit for the decision makers and the marketing teams of the premium level fashion brands in Sri Lanka, when they want to change and improve their marketing strategies.

LITERATURE REVIEW

Introduction on the marketing strategy

It has been said that an organization will be committing entrepreneurial suicide if it does not have an understanding of the target market and inevitably the business would fail due to this reason. But, will be able to attract heaps of profits if the company is aware of the needs and wants of the target consumer. Here, as the marketing strategy the main focus will be on the marketing mix. According to Asseir and Acutt (2015, p.4), the definition of the marketing mix is, "It is about putting the right product or a combination thereof in the place, at the right time and at the right price" Further, Asseir and Acutt (2015, p.13) states that marketing mix is associated with the 4Ps and as per the creation of the marketing expert, McCarthy 1960, the classification of 4Ps can be summarized as below (Refer Figure 01).



Figure 01 - Classification of 4Ps (Asseir and Acutt 2015, p.13)

When using the 4Ps model it is very important to be customer oriented. As cited by Lauterborn (1990), Luenendonk (2014) put forward his customer centric 4Cs classification.

- Product to Customer Solution
 - Price to Customer Cost
 - Place to Customer Convenience
 - Promotion to Customer Communication
- (Luenendonk, 2014, para.26)

Product

When considering the 4Ps, Product can be simply classified as below, as mentioned by Asseir and Acutt (2015) “A product is an item that is built or produced to satisfy the needs of a certain group of people. The product can be intangible or tangible as it can be in the form of services or goods.” (Asseir and Acutt, 2015, p.6) The marketer must do an in depth research on the life cycle of the product that they are producing, in the product development phase in order to make sure they are producing the type of the product that has the highest demand in the targeted market.

The life cycle of a product includes the growth phase, the maturity phase, the sales decline phase and during the latter stage it is very important for the organization to come up with new products and innovations for them to increase their sales. It is also important to have the correct product mix and expand it along with the product cycle, by diversifying and increasing the depth of the product line in order to gain the competitive advantage. When developing the product it is important to ask the question, “What can I do to offer a better product to this group of people than my competitors?” (Asseir and Acutt, 2015, p.7)

Price

The price of a product affects sales and demand, making a huge impact on the marketing strategy which eventually leads to the profits and the survival of the organization. During the initial stage of the product the business should price it at a lower price, although it has the potential to give a higher percentage the consumer will not be willing enough to pay a higher price for a product at the birth. The consumer will always value for their money over the product and will compare it with the competitor’s product therefore the organization needs analyze their competitor’s prices and do the pricing accordingly. The three major pricing strategies are, Market Penetration Pricing, Market Skimming Pricing and Neutral Pricing. “The price of the product is basically the amount that a customer pays for to enjoy it. Price is a very important component.” (Asseir and Acutt, 2015, p.8)

As per Asseir and Acutt (2015) there are few questions that should be asked when coming up with pricing strategies.

- “How much did it cost you to produce the product?”
- What is the customers’ perceived product value?

- Do you think that the slight price decrease could significantly increase your market share?
- Can the current price of the product keep up with the price of the product's competitors?" (Asseir and Acutt, 2015, p.9)

Place

Place plays a major role in the marketing mix and it can be defined as follows, Martin (2014) as cited by Isoraite (2016, p.7) refers to Place as the process and methods by which products or services reach customers. Asseir and Acutt (2015, p.10) say that Place is about positioning and distributing the product in a place that is accessible for the potential buyers. In order to find out the most efficient positioning and distribution channels that directly speak to the target market the organization needs to do an in depth analysis of the target consumer and understand them inside out. Some of the major distribution strategies are, Intensive Distribution, Exclusive Distribution, Selective Distribution and Franchising. Asseir and Acutt (2015) have mentioned the questions the company should ask when selecting the best distribution strategy.

- "Where do your clients look for your service or product?
- What kind of stores do potential clients go to? Do they shop in a mall, in a regular brick and mortar store, in the supermarket, or online?
- How do you access the different distribution channels?
- How is your distribution strategy different from your competitors?
- Do you need a strong sales force?
- Do you need to attend trade fairs?
- Do you need to sell in an online store?" (Asseir and Acutt, 2015, p.11)

Promotion

Promotion plays a major role in the marketing mix as it enhances the organization's brand recognition and increases the sales. The main elements that comes under promotion are, Sales Organization, Public Relations, Advertising and Sales Promotion. The combination of the promotional strategies and how the promotions should be carried out will depend on the budget, the message that needs to be communicated and the target market.

Asseir and Acutt (2015) also states the questions that should be asked by the organization when selecting the most effective promotion strategy.

- "How can you send marketing messages to your potential buyers?
- When is the best time to promote your product?
- Will you reach your potential audience and buyers through television ads?
- Is it best to use the social media in promoting the product?
- What is the promotion strategy of your competitors?" (Asseir and Acutt, 2015, p.12)

The rise of Generation Z

Generation Z is the demographic born between 1995-2010 and they are a particularly a group of people that is hard to understand for the fashion and beauty marketers. Biron, 2017 states the following, "The 61 million members of Gen Z are defined as the first generation of truly digital natives, born into an era in which the internet had always existed and was never a novelty. As a result, more than any other generation, they are drawn to the ephemeral nature of apps like Snapchat, and shy away from owning products in favor of renting. This has translated directly to how they make purchases; Gen Z teenagers are more frugal and money-conscious than their millennial counterparts, despite growing in spending

power at a rate that surpasses millennials, reaching an estimated \$44 billion” (Biron, 2017, para.2). Further Biron (2017) has mentioned that, Kate Lewis, editorial director at Hearst Digital Media states that generation Z is a group of risk averse consumers because of their attitude of being money conscious and having to grow up in a challenging economic and political climate (Biron, 2017, para.3). “There’s a focus on rental, instead of acquisition,” says Medine, (as cited in Biron, 2017) a fashion industry notable. She also explained that Generation Z are the group of people who would rent out their prom dress rather than spend a fortune by buying it from a department store (Biron, 2017). Jeff Stapel, fashion designer and founder of Stapel Design, Inc (as cited in Biron, 2017) mentioned, “I’ve never enjoyed standing in line. But, [for Generation Z], they’re so used to getting something off of Amazon in one click or off of eBay. Now, they want to line up, because it’s an opportunity for them to hang out and socialize with their cohort.” (Biron, 2017, para.7) And according to him generation Z has a particular strong tie to street wear culture (Biron, 2017).

During the interview with Leslie Ghize,(as cited in Biron, 2017) from the trend forecasting company TOBE mentioned that, “YPulse (Youth marketing, millennial marketing and millennial research) data shows that 82 percent of consumers ages 13-17 don’t care about brand names, 75 percent enjoy testing new brands and 66 percent think brands that experiment with new ways to sell or deliver products are innovative. As a result, the Generation Z set is creating unique pairings and establishing looks in ways even the designer never thought of.” (Biron, 2017, para.9)

Influence of Generation Z on fashion apparel

Because of the high potential of the generation Z being a higher percentage of

consumer spending, there will be major influence on many industries including the fashion apparel. Marcie Merriman (as cited in Zaczekiewicz, 2018) states, “The young, in this case Generation Z, influences the success of every brand and retailer, even if they are not yet the customer. Within societies, youth have always been the drivers of change — whether in fashion, social, music or use of technology. Where today’s tweens and teens, who fall into the Generation Z bracket, are different is in their ability to connect instantly and disseminate information globally. They were born into a mobile-first, omni-connected universe (all connected). Intuitive shopping experiences that put them in control — and give them the ability to make a purchase at the moment of inspiration, which is far from static — will be the winners.” (personal communication, May 23, 2018) Generation Z has marked the start of major cultural shifts and youth focused fashion brands who hold traditional views towards, race, gender, sexuality, and religion are viewed as offensive and dated. Brands who understood this early and took risky stands are winning. Apart from that generation Z appreciates the unique and flawed as authentic (Zaczekiewicz, 2018, para.9). The literature review covers a brief description on the marketing mix (4Ps), the rise of generation Z and their influence on the fashion apparel. The next chapter will describe the methodology of the study in order to give suggestions to improve the marketing strategy of the local fashion brands.

METHODOLOGY

In this research the literature review will cover the introduction of the marketing mix, generation Z and their influence on fashion brands, while the data analysis will discuss the marketing strategies followed by the global premium level fashion

Product and price

In order to gather data of the preferences of generation Z in terms of premium level fashion brands in Colombo, a questionnaire (Appendix 1) was circulated among 150 female consumers who are between 15-25 years old that lives around Colombo and who shops from the premium level brands in Colombo such as Kelly Felder, Cotton Collection, and Gflock. According to the data from the questionnaire (Appendix 1), the below graph was extracted and it refers to the type of products mostly purchased from the premium level local fashion brands (Refer Figure 03).

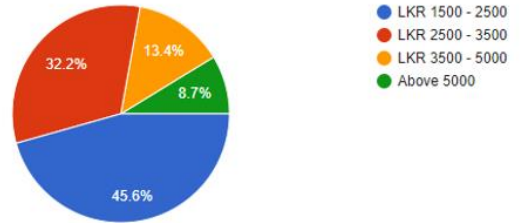


Figure 04 - General price ranges

The above pie chart shows the general price range this generation would go for. (Refer Figure 04) It is quite evident that a higher percentage (45.6%) prefers the lowest price range of LKR 1500-2500, but there is also a quite amount of consumers (32.2%) that would go for the LKR 2500-3500 range as the percentage margin between the two price ranges are quite narrow. The above 5000 range is not preferred by many of the consumers as it has a very low percentage of 8.7%.

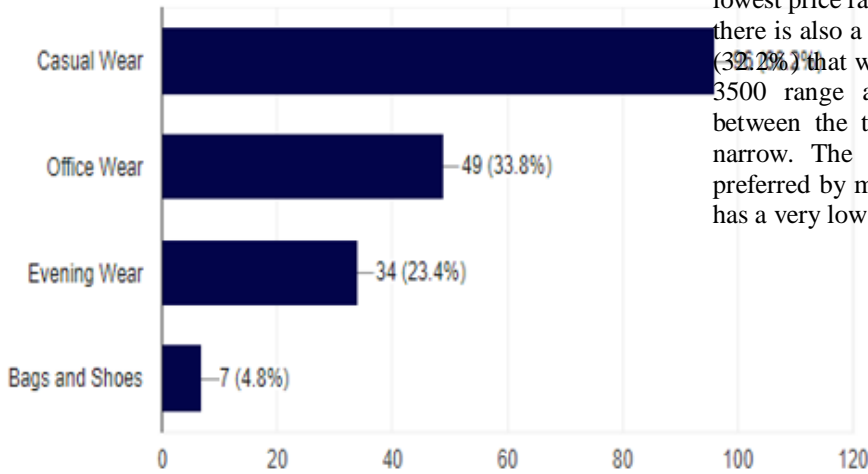


Figure 03 - Types of products mostly purchased from the premium level local fashion brands

The above data reflects that the majority of 66.2% visits these premium level fashion brands to purchase casual wear apparel while only a 33.8% purchases office wear. A 23.4% of consumers purchase evening wear while a very low percentage (4.8%) goes for bags and shoes.

Pleasant atmosphere and attractive ambience - 12%
 Trendy, fashionable new designs - 42.3%
 Affordable prices - 11.3%
 Quality Products - 34.5%

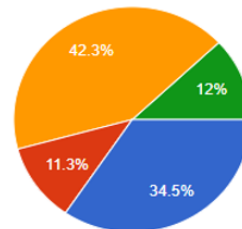


Figure 05 - Mostly expected from the premium level fashion brands in Colombo

The preference on what is mostly expected by the generation Z, from the premium level fashion brands is reflected from the above chart. (Refer Figure 05). The majority expects to have trendy fashionable new designs while most of them expect to have quality products as well. 12% of consumers expect to have a pleasant atmosphere, with an attractive ambience and a friendly staff in the store. Although there is a lower percentage of 11.3% for the preference of affordable prices, it is also one of the important expectations which the fashion brands need to pay attention to.

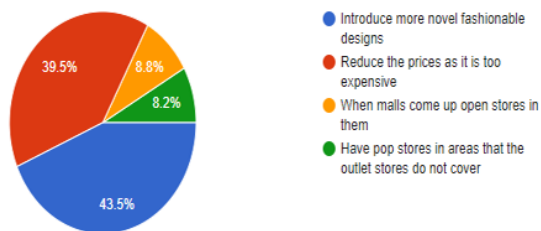


Figure 06 - How the premium level fashion brands in Colombo should be improved

The data of the above pie chart refers to the analysis on how the consumers think the local premium level fashion brands should be improved and what they would like the fashion brands to have in the future. (Refer Figure 06) A higher percentage of 43.5% shows that generation Z expects the local fashion brands to introduce more novel fashionable designs, while 39.5% would want them to reduce the prices. A similar, lower percentage of 8.8% and 8.2% expects to have stores opened up in the malls and to have pop up stores respectively.

From the above data analysis it is evident that generation Z consumers would always prefer casual wear and would go for quality products that are trendy, new, fashionable designs at an

affordable price and they expect the fashion brands to reduce prices while introducing more novel fashionable designs in the future. This can be further clarified from the below facts when considering the global context, It was mentioned by Premack (2018) that Nike, Adidas and Forever21 dominate in the list of brands of generation Z. He also stated that teens are all in to street wear, athleisure and fast fashion. Bobila (2017) stated that generation Z cares a lot about what exactly they are spending their money on and whether they are being discriminated in any way by the brands. He also mentioned in order to tap in to this market it is always successful to offer services such as customization, personalization and crowd-sourcing designs. Pruett (2018) expressed that generation z always values comfort and function. They prefer flowy fabrics over tight dresses and is more interested in taking a casual approach to style, giving out a spontaneous aesthetic look. “For them, looking different (cool!) is paramount, and looking weird (even better!) is attractive. It means you’re confident enough to be unique.” (Pruett, 2018, para.7) Kline (2017) declared that 66% of this age group believes the most important factors when selecting a brand over another is product quality and availability and that 65% focus on value. Below is a summary (Table 02) of the marketing strategies followed by two of the main global premium level fashion brands that are quite popular among the generation Z consumer

BRAND	PRODUCT	PRICE
ZARA	<ul style="list-style-type: none"> • They are able to respond very quickly and adapt to the needs of the customers that change all the time. • This is one of the major strengths of Zara. • The company is not outsourcing their core competency which is the manufacturing process. • The production takes place in house, making sure they are in fully control of the products produced. • Their unique way of the selling proposition is to create the latest trends. • They make sure their new styles are available on sales stores only for a short period of time (2-4 weeks maximum) while immediately pulling out the products that are not being sold in the stores. 	<ul style="list-style-type: none"> • They provide their products at a reasonable price to the cream of customers who would compare Zara with Hugo Boss or others, where they would find Zara products quite affordable. • But mostly Zara follows a Premium pricing strategy which has been made possible by optimizing development and training costs.
H&M	<ul style="list-style-type: none"> • The company focuses on quality and the latest fashions at a reasonable price which gives them the capacity to launch newer product lines at regular intervals. 25% of the company's stock includes the fast fashion products, targeting the newer generation of teens who find them reasonable, trendy and chic at the same 	<ul style="list-style-type: none"> • They have adopted a broader pricing range to meet the needs of every sphere of buyers. • To maintain a Median pricing strategy the company offers various discounts and schemes which results in higher volumes of sales giving larger revenues.
	<p>time. Therefore H&M targets the younger segment which results in higher sales of products.</p>	<ul style="list-style-type: none"> • In order to make products economical the company tries to cut costs from every possible corner which makes their average selling price lower than the competitors. • Also the executives in the company are directed to make purchases at the lowest rates possible to maintain lower overheads. • One of the highlighting facts of H&M is that they have been able to supply quality products at a lower price ranges because of their strategy to reduce the part of intermediary in all transactions, who purchase and sell to the company at higher margin. • With the exit of the intermediary the company is directly purchasing from the supplier in bulk amount which helps in reduction of cost prices because of the economies of scale leading to lower selling prices.

Product

- Always introduce more novel, trendy, chic designs and keep them included in the weekly collections.
- Launch newer product lines at regular intervals and make sure they are aligned with the upcoming trends.
- Focus more towards casual and easy to wear
- Designs should look luxurious while being comfortable.
- Usage of soft, flowy fabrics
- Oversized outfits
- Focus on Athleisure
- Leather garments (Jackets and Pants)

Price

- Offer quality products at a reasonable, affordable price
- Have a broader price range
- Offer various discount schemes and coupons
- Have mid-year and seasonal sales

Figure 07 - Suggestions to improve the product and price strategies of the premium level fashion brands in Colombo

Place and promotion

The below chart reflects the preference on the type of retailing (Refer Figure 08). A higher percentage of 91.3% opts for outlets stores rather than online shopping and pop stores which implies that most of the generation Z consumers prefer physical retail, simply because you can see, touch and feel the product unlike in online shopping. And also you can visit the store whenever convenient which is not possible in pop stores as they are only available for a short period

The chart below cites, whether the generation Z consumer follows these local premium fashion brands on social media and how well updated they are with the weekly collections of these brands (Refer Figure 09).

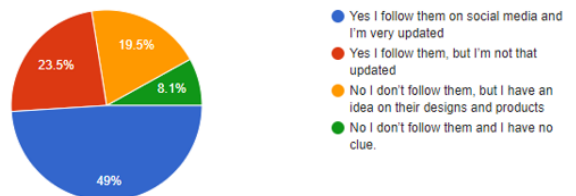


Figure 09 - Followers on social media of the premium level fashion brands in Colombo

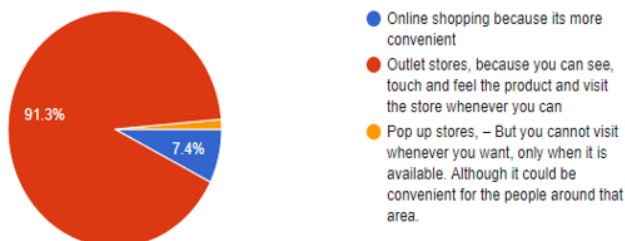


Figure 08 - The types of retailing

Here most of them are following these brands on social media and are very well updated while a percentage of 23.5% are following the brands on social media but they don't check on it often making them not quite updated with the weekly collections. A very few of them (8.1%) don't follow the brands on social media and have no idea with the new designs as they are the type to visit the store and shop

spontaneously. 19.5% of the consumers don't follow the brands on social media but have a somewhat of an idea on the weekly collections and the discounts.

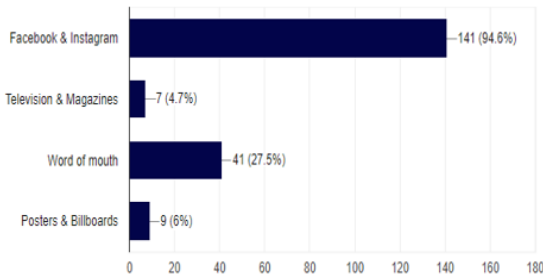


Figure 10 - Medium of source

The above graph shows the data on the medium of sources, where the consumers would get to know about a new brand/ clothing line/ retail store in Colombo (Refer Figure 10). Almost 95% of the consumers' medium of sources are Facebook and Instagram which clearly reflects that social media is the most powerful medium of source among generation Z. There is also a certain amount (27.5%) of consumers who use word of mouth as a medium of source, while only a very few uses television, magazines, posters and billboards.

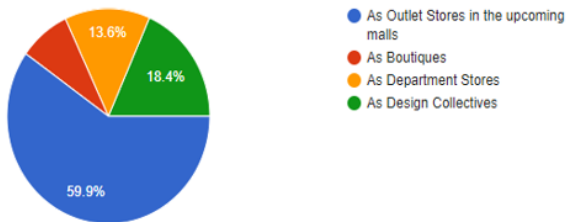


Figure 11 - How the consumers want the fashion brands to be expanded in Colombo

The above data presents how the consumers want these fashion brands to be expanded in future (Figure 11). It is quite evident that almost 60% opts for these

fashion brands to be expanded as outlet stores in the upcoming malls, implying that the generation Z consumer prefers to shop at malls. 18.4% of consumers expect the fashion brands to be expanded as design collectives while only a few prefers boutiques and department stores.

The above data can be further ratified by the facts below, in terms of the global context. Renfrow (2017) says, most of these youngest shoppers go in store to buy apparel but go through them online first. Although they are very tech savvy this group of consumers found purchasing online is less fun than buying in store. Renfrow (2017) also mentioned that department stores are quite unpopular among the generation Z. This age group would always keep sharing their lives on social media across Instagram, Snapchat and Youtube (Pruett, 2018). "The study found that 67% of Generation Z shop in bricks-and-mortar stores most of the time, with another 31% shopping in-store sometimes, which indicates 98% of this cohort shop in stores at least some of the time. The survey of more than 15,000 consumers aged 13-21 from 16 countries also found that 74% of respondents spend free time online, with 25% being online five hours or more each day." (Kline, 2017, para.5) Despite being popular among generation Z in terms of the global context, the most iconic premium level fashion brands in Colombo follow the strategies of Zara and H&M. Below is a summary of their place and promotion strategies, catering for the generation Z consumer (Refer Table 03).

Table 03 - Place and promotion strategies of global fashion brands (Bhasin, 2017)

BRAND	PLACE	PROMOTION
ZARA	<ul style="list-style-type: none"> • The company stands out as a brand because it's vertical integrated retailer, where they design, manufacture and distributes the product itself. • The customers experience the same environment when entering in to each and every store of Zara. • The stores are more spacious, well – lit, modern and predominantly whiter and walled with mirrors. The company makes sure to hire young designers and train them to make good decisions. • Every mall owner is interested in providing free space for Zara clearly shows the volumes of the popularity of this brand in <u>Urban</u> areas and the long way it has travelled. 	<ul style="list-style-type: none"> • The company's unique marketing strategy of, "Zero investment in marketing" is where they use the money to open stores rather in advertising. • The key marketing strategy is based on Exclusivity, Experience, Differentiation and Affordability in order to differentiate itself from the competitors. • The company relies heavily on the word of mouth, hence they pay attention to each and every detail of their showrooms. • Elegancy in which the way the windows are laid out, how the shop attendants are groomed and every store manager has free access to talk to their counterparts regarding the marketing and improvement strategies. • Apart from that bar coding, online shopping and computer aided
H&M	<ul style="list-style-type: none"> • The company has followed the policy of purchasing raw materials directly from the suppliers and selling the finished goods directly to the retailers. • They have also set up a wide network for online sales, where the consumer can go through the products at their leisure and order via internet which has resulted in higher amount of sales. • The H&M retail outlets are found to be very convenient by the consumers as they are able to shop for different products at one store. • The company expanded itself at a faster rate on locations that are easily accessible and as well as reasonably priced. • They have taken the advantage of slower economy to secure some high profile locations at very realistic prices. 	<p>purchases are designed to increase sales and make it a global brand.</p> <ul style="list-style-type: none"> • The company has utilized the electronic media of television by sponsoring many hit and trendy shows, uses many high profile celebrities as brand ambassadors and their ads appear on famous magazines such as Vogue Netherlands, British Vogue and British GQ. • Some of the marketing strategies that H&M uses are, tweeting about their collection in parts along with Instagram pictures, uses a wide range of exclusive designers who in themselves are a unique marketing brand and they also send some of their clothes to celebrities. • Currently the company is working on a new marketing plan through mobile phones where the clients receive a SMS that are treated as coupons that can be cashed out at any retail outlets.

After analyzing the above facts, suggestions to improve the place and promotion strategies of the premium level fashion brands in Colombo are as follows;

Place

- Open more outlet stores in the upcoming malls
- Make sure the stores are more spacious, with good lighting, mirrors and whiter walls.
- It is important to have friendly, helpful sales persons at the retail outlets
- Give an interactive, mobile focused shopping experience
- Have smart services at the retail stores.

Promotion

- Mainly use social media for promotions. Specially Snapchat, Instagram and Facebook
- Use different formats such as pictures, videos and stories
- Instead of selling the product, sell the value of the product, the benefit the consumer will gain by using it. Focus on the value of the business and the social good provided.
- Communicate the message clearly, quickly in a very simple manner
- Focus on generation Z customer experiences and use them for promotions
- Have authentic, interactive entertaining activities by providing mobile app solution
- Make sure all promotions are accessible through mobiles.
- Use social media strategically in order to receive reviews, feedbacks and ratings.

Figure 12 - Suggestions to improve the place and promotion strategies of the premium level fashion brands in Colombo

The suggestions to improve the marketing strategies of the premium level fashion brands in Colombo were obtained through the analysis of the consumer survey (Appendix 01) and the strategies used by the global premium level fashion brands. These suggestions are provided for the local fashion brands to gain customer satisfaction by improving their marketing strategies, focusing more on the generation Z consumer. Stemming from the data analysis the next chapter will contain the conclusion of the study.

CONCLUSION

This chapter contains the conclusion of the entire study and how the objectives have been achieved from the research. The first objective is to give suggestions to improve the marketing strategy of the premium level fashion brands in Colombo. This objective has been achieved by analyzing the needs and the preferences of the generation Z consumer in terms of premium level fashion brands in Colombo with the marketing strategies followed by the popular global premium fashion brands among the generation Z, such as Zara and H&M. The second objective which is to identify the consumer needs in order to increase sales by gaining customer satisfaction is achieved by identifying the needs of the generation Z consumer in Colombo from the consumer

survey and by analyzing the needs of the consumer and how to attract the consumer from the global context based on the 4Ps model. It is important for the marketing teams of the premium level fashion brands to pay attention to the generation Z consumer as there is a very high potential of generation Z becoming a higher percentage of the consumer spending in the future. In order to sustain in the market these brands should make a few changes and improve their marketing strategies to cater to the generation Z consumer and bring customer satisfaction. The marketing teams of these brands can incorporate the above mentioned suggestions and improve their marketing strategies, focusing on the generation Z consumer.

These brands can expand themselves not only nationally but also globally if they start focusing on the generation Z consumer as they are highly influential and can make a huge impact on the fashion brands.

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MODERNIZING PATTERN CUTTING TO ENABLE TRADITIONAL SAUDI DESIGNS TO BE MADE FOR NEW CONSUMERS

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ABSTRACT

Traditional costumes are important to cultural identities and display a sense of heritage design developed over generations. The types, shapes, colours and functions of traditional garments demonstrate cultural heritage, status and skill, though are often time-consuming to produce. The structure of traditional designs is often less simple than modern flat drafting approaches methods of creating patterns and garment shape and require draping and direct engagement with the wearer throughout the process. This research identifies the key components of the pattern cutting system for Sawwan garments and how it has evolved with respect to Saudi dress and how this influences the traditional Sawwan garment designs. Through observation analyses, comparing the traditional sawwan method to modern and practical work identified features can provide a framework for using modern technology to develop these traditional garments. This paper documents the methods for creating a modern technology enabled approach to embed traditional Saudi styles into a garment which is functional and can be worn in a modern context retaining elements of traditional styling and cut.

Keywords: Garment shape, Sawwan approach and Modern pattern making approach.

INTRODUCTION

Humans have been wearing clothing since ancient times (Onuma, 2009). Traditional Saudi dress is one of the fields of folk art that preserves its personality, represents its ancient world, and preserves its effects. Saudi women have emerged in the field of traditional costumes in a way that has demonstrated their ability to make good use of what is available in their environment (Nader and Maglan, 2010). Clothing is referred to as traditional dress if it incorporates elements of past traditions and reflect what is typically worn by a particular group of people, thereby helping to preserve their cultural heritage (Eicher and Sumberg, 1995). Importantly, wearers of traditional dress are not only signalling their ethnicity and cultural roots but are also indicating their cultural values to others (Forney and Rabolt, 1997). (Momen and Gerges, 2004) reported that the culture of dress in any state reveals the zeitgeist from different areas such as economic, social issues, cultural activities and intellectual aspects. For example, the traditional dress in different regions of Saudi Arabia has

unique designs, shapes, fabrics and motifs that reflect their environment. Nevertheless, the discovery of oil in the Kingdom of Saudi Arabia led to great developments in all fields of cultural, economic and social life. Consequently, development, technical progress and lifestyles have changed and the personality of the individual has been influenced by Western civilization (Mimny, 1996). One result of this development is that Saudi women's clothing has been influenced by Western clothes. This has also impacted on the versatility in performance and accuracy of manufacturing witnessed in the garment industry and has resulted in a wide variety of fashion designs being made available globally (Almalki, 2017). Saudi women desire a luxurious lifestyle and this is apparent from their clothing. For example, Al Jassim is a Saudi Arabian fashion designer who was interviewed by Siraj Wahab from Arab News magazine (2009:3) and reported that: "It is no hyperbole to say that fashion Amina Al-Jassim illustrates the innovative spirit of Saudi businesswomen today". She has improved the traditional designs of Saudi formal outfits and transformed them into ready-to-wear clothes and goods. She trades at her Alkhobar-based Dar Breesam Couture Establishment.



Figure 1 Amina Al-Jassim whose collection and work are based around heritage. Her work shows a very sophisticated style and haute couture collections and meets the demands of modern society. The image offered by <https://www.facebook.com/darbreesam.aminaalja>

However, this study will focus on a traditional women's garment (Sawwan, 1958) in the Bani Malik area of Saudi Arabia. Although the empirical literature does not contain documentation of the process for making the garment, what does exist are the details of how the garment appears, either as images or as a text-based description (Albasam, 1985; Mimny, 1996; Ajaji, 2005; Iskandarani, 2006; AlMalki, 2017). Therefore, we have to understand the method of manufacture to establish how the garment may have been made in the past.

Old civilisations have tried to create different pieces of clothing around the body (Bukhari, 2009). (Abdeen, 2001) indicates that the clothing was made out without taking measurements and the method of preparation affects the overall body. However, people who lived at that time tried to find different methods of pattern making to create their chosen design. Beazley and Bond (2003) demonstrated that to structure a pattern, measurements of the body are a prerequisite. Generally, men and women have similar outdoor garments. In Saudi society a woman would be the main clothes maker for their family and would shape the pattern directly from the body, considering the units to take the required measurement and construct a loose, simple garment while ignoring the requirements of the body size systems. Women had many pieces of clothing to wear in Bani Malik, including garments that were worn in private at home and those that were worn in public: undergarments such as pantaloons worn under the thawb; overgarments such as the thawb, of which there are two varieties (one that is worn at home and another that is worn only for special events including weddings which is known as a Sawwan). All costumes were made by local women and exhibit the geometric forms that were used to decorate women's dress in Bani Malik

AlHijaz with various motifs and colours (see Figure 2) (Almalki, 2017).



Figure 2 traditional Sawwan garment tubular shape, the garment display by heritage museum in Bani Malik, 1938

Those who create garments must take a flat piece of cloth and fit it to the 3D form of the human body (Onuma, 2009). Therefore, it is necessary to consider the pattern design when creating garments and this requires an appreciation of how a 2D flat pattern can become a 3D garment (An ASBCI Technical Handbook, 2015). Nevertheless, the tailors in Bani Malik overlooked the dimensions of the human body when they structured the Sawwan pattern and did not consider the differences in bodyshape. They made the Sawwan garment in the style they had learned. Therefore, this paper will utilise modern pattern making methods to incorporate traditional Sawwan designs into a modern dress to explore the opportunities for integrating traditional Saudi designs into modern clothing patterns and better accommodating the wearers shape. The purpose is to demonstrate ways in which traditional dress can be fused with modern fashion trends in a manner that remains respectful of regional heritage.

Aim of the study

This study aims to reveal the construction system that has been used to

create the traditional women's costumes (Sawwan garment, 1958) of Bani Malik and the ability of an existing method to enhance the Sawwan garment to ensure that the wearer gets a well-fitted and functioning garment.

LITERATURE REVIEW

Making of the pattern

(Abdul Ghaffar, 2016) indicates that if some people were able to cut clothes without using a pattern and while using only simple measurements, it is possible to familiarize the shape and measurements to cut patterns based on their practice. However, they cannot make multiple models and different styles and it does not give the exact adjustment or a good fitting to the body. Tailors in Bani Malik used their knowledge to find their own systems and measurements to design Sawwan garments. Therefore, studying and understanding the pattern is important to produce a comfortable garment that fits well and that is what this study attempts to do by enhancing the sawwan pattern. The making of a pattern is the process of shaping a flat piece of the paper or fabric to conform to the average body figure (Bukhari, 2009). Therefore, to generate a basic pattern for the garment, there are two methods. The first is the flat pattern which represents the two-dimensional components of a garment (Beazley and Bond, 2003).

(Gill, 2011). Indicate that the other is a draping method known as three-dimensional (3D) whereby a flat fabric is directly formed into a garment on a dress form Abdul Ghaffar (2016) explained that a commercial pattern is a paper pattern prepared according to standard measurements of a normal body that conforms to different types of objects. For example, you can create a pattern for

women with a short waist and long waist but they may not all be identical.

The construction of the pattern

The process of garment production includes all related activities including the construction of the pattern and product development (Beazley and Bond, 2003). Constructing a pattern provides the most accurate, structured method for achieving the best fit possible (Gill, 2009). In addition, the wearer of the garment must truly reflect the body's appearance if the result is to look good and be a thing of beauty (Fan, Yu and Hunter, 2004). Some garments are designed purely to be fashionable, whereas others are required to perform a particular purpose but all must fit well and serve their function. If this is not the case, the garments may be uncomfortable and in some cases may pose a danger to the wearer; for example, by impeding their movement (Gill, 2009).

Body measurement

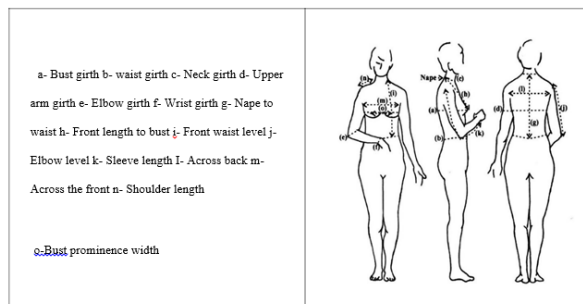
To structure a pattern, taking measurements of the body is a prerequisite (Beazley and Bond, 2003; Abdul Ghaffar, 2016). Measuring the body by hand is time-consuming and requires the person measuring to demonstrate a high degree of skill (Beazley, 1997). However, today it is possible to automate the measuring process and this supports the existing manual methods to achieve accurate measurements (Beazley and Bond, 2003). Below are the details of the manual and computerised measuring processes:

Measuring the body manually

Preparing for measuring is important to achieve accurate results (Abdul Ghaffar, 2016). Beazley and Bond (2003) indicate that before taking measurements of the body, there are certain techniques that

should be taken into account. For example, the person being measured should stand normally on the feet and relax their shoulders. Also, they should only wear under clothes, if possible. Finally, the measurer should stand to one side and not move.

Table 1 The position of the measurement for body and sleeve in the most modern methods The image offered by (Beazley and Bond, 2003)



Measuring by computerized means

Body scanning is a process whereby technology is used to create a 3D impression of the human form (Gill, 2015). This typically involves the projection of light and the use of image capture technology to create an electronic impression. Aldrich (2015) states that 3D body scans can be produced in a matter of seconds by stepping into a body scanner that automatically takes more than one hundred measurements.

3D body scanners use a combination of cameras, lasers and audio waves and because it measures the body from all angles, it is considered to be the most accurate body measuring system (Page, 2013). Beazley and Bond (2003) state that 3D scanners that can produce anthropometrics data provide a direct link to 3D design and pattern making.

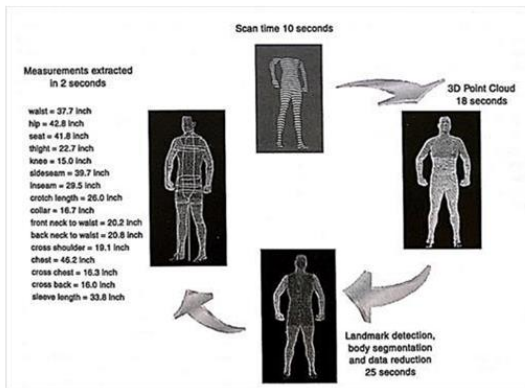


Figure 3 illustrate the measurements and data of a virtual model by 3D body scan by (Beazley and Bond, 2003)

Review of computer aid design (CAD)

The ideal pattern draws upon both modern technology and traditional manual methods (Bloomsbury Visual Art, 2019). In the current study, a traditional manual pattern produced for sawwan garments has been amended using the Lectra's Modaris software into CAD, as set out in the methodology section. Lectra's Modaris was released during 1984 and offers various pattern modification tools for use in industry (Bloomsbury Visual Art, 2019). In addition, digital pattern cutting not only improves accuracy but also speeds up the process, thereby helping to reduce costs (Bloomsbury Visual Art, 2019). Furthermore, Beazley and Bond (2003) note that CAD technology has made the cutting of patterns and the construction of garments more systematic and structured.

The value of a traditional garment

The features of traditional costumes have been somewhat lost as a result of globalisation and, therefore, that reflects on the way people dress today. However, there are some studies that value and attempt to integrate the character of traditional style into a modern brand. Lee's

(2017) study provides a new style and brand of traditional Korean fashion that echoes domestic Korean features via a reinterpretation of hanbok shapes and employs traditional methods to effectively build a bridge between global and local styles. Furthermore, Tawfiq and Marcketti (2017) investigated historical AlHijazi bridal costumes and revealed that there are four themes, the most important of which are how the garment looks on the wearer, the beliefs that lie behind the different elements of the costume, the motivation agreed within families, and the choice of occasion when such garments are to be worn. The current study reflects opinions of those who value traditional garments. Reviewing the historical style of British fashion between 1740 and 1830, Cambble (2016) and Quinton (2017) show how the costumes present themselves in a new mood in each decade, influenced by location and social life.

Enhance traditional garment pattern

To date, however, there has been little discussion about traditional pattern construction in the empirical literature (Sadiq, and Albassam, 1996; Khoqair, 2005; Maqlan, 2007; Khar and Ayachit, 2013). Sadiq and Albassam (1996) focused on the Maqtaa garment in the Najd region of Saudi Arabia and followed the traditional measuring system based on the width of the shoulder. Khoqair (2005) considered the Masdah garment in the western region of Saudi Arabia but study fails to clearly demonstrate the process of constructing the garment. Furthermore, Maqlan (2007) examined the Maqtaa garment and employed modern methods to design an improved basic pattern for the garment. However, this study overlooked the role that technology could play in designing the pattern (i.e. CAD), whereas the current study has utilised technology to create a traditional Sawwan pattern.

Another study by (Khar and Ayachit, 2013) study attempted to merge traditional Indian garments with modern styles using draping and metric methods, while also following traditional measurement techniques.

Trending style in Saudi Arabia a

The way in which women dress today in Saudi Arabia is somewhat different from how they used to dress in the past. It is now relatively common to see women wearing jeans and long skirts on a day-to-day basis. Indeed, some women will wear Western-style coats and jackets over their clothes wore less try This paper explores the trending lifestyle in Saudi Arabia and how the notion of luxury influences how young people think. This is very apparent in the Saudi market. Rabolt and Forney (1989) indicated that the buying power of individuals is considerable and they have a preference for convenience and luxury items. Wages in Saudi Arabia are among the highest in the world and this is reflected in the choice of clothing (Tuncalp and Yavas, 1986). However, unlike many other markets for clothing, Saudi Arabia has unique traditions and is devoutly religious and these elements are reflected in the choice of clothing and the patterns used, especially in women's garments. Gaining an appreciation of what influences the choice of clothing in Saudi Arabia is of interest because the domestic manufacture of garments is generally restricted only to native dress. Any Western styles are imported and there is a shortage of children's and women's clothing in the country (Dawson, 1986). Trade between Saudi Arabia and the West has influenced the dress of Saudi women. When Christian Dior opened a concession in Riyadh and Yves Saint Laurent opened one in Jiddah, the first consignments of high-fashion items sold out in just a few weeks (Azzi, 1980). Indeed, the influence of Western design can now be seen in traditional forms of

dress in Saudi Arabia with women's veils and cloaks now adorning designer logos and emblems (Alireza, 1987).

In 2011, the Reuters news agency reported that women in Arab countries were the largest source of demand for haute couture collections in the world (Almalki, 2017). Noha Al-Sedawi reported in the Saudi-published Sayidaty magazine in August 2017 that the Saudi fashion expert and business woman Maryam Musli has been active in empowering and promoting Saudi women in the fashion industry in Los Angeles. This included a discussion of the changing trends and growing sophistication of Saudi fashion. For instance, the styles worn in Saudi Arabia have been influenced by a range of factors including travel, education, work and socioeconomic status (Rabolt and Forney, 1989). The picture below has been taken from a Saudi shop in 2019 and this an evidence of the fashion tastes of contemporary Saudi women and how their desires have changed as a result of globalisation. However, the images illustrate how modern style has replaced traditional dress as a result of the rapid growth and modernisation of the Saudi market. Saudi women aspire to sophistication and that makes the researcher aware of the need to understand what this study can adopt to propose a method for utilising Sawwan garments.



Figure 4 the growth of the modernization has impacted the Saudi Arabia market

METHODOLOGY

The following methods will be applied in the current study: Comparison of modern methods and the Sawwan method and analysis each approach. A variety of modern methods have been used to draft patterns but this research has selected the Profili method due to the familiarity of the researcher with this method and also because it has been used for educational purposes in Saudi Arabia. In addition, the Aldrich method is a commonly used method in the UK and is used when learning how to draft patterns. Moreover, modern methods are known to be used for academic purposes and in industry (Profili, 1949; Aldrich, 2015), whereas the traditional Sawwan methods are used for crafts and for the purpose of special occasions (Almalki, 2017). Nevertheless, a variety of modern methods have been used to create flat pattern drafting, mainly from direct measurements. Analysis of existing methods reveals that traditional Sawwan garments have used various approaches similar to the draping method whereby the pattern is shaped directly from the body onto the fabric to give a loose, simple garment. Profili (1949) presented a clear pattern making method consisting of visual descriptions of the pattern draft. Aldrich (2015) built upon prior editions and included easy-to-follow instructions as well. The following analysis provides systematic measurements for three methods that are used in this study, including the ease of each method. Moreover, all methods use direct measurements and a proportion system to draft the pattern and this can be found in Table 2.

Table 2 the systematic measurements of three methods

Usage measurements	TSM		PRO		ALD	
	Direct measurements	Proportion measurements	Direct measurements	Proportion measurements	Direct measurements	Proportion measurements
Bust circumference	Y		Y	6 cm	Y	10 cm
Waist circumference	Y		Y	4cm	Y	6 cm
Hips			Y	The ease has been added through measuring	Y	5 cm
Across Chest			Y		Y	
Shoulder			Y		Y	
Neck depth (front)	Y					
Neck width (front)						
Neck depth (back)	Y				Y	
Neck width (back)	Y				Y	
Shoulder width	Y				Y	
Back width						
Waist to waist			Y		Y	5cm
Front shoulder to waist			Y		Y	
Armhole depth	Y				Y	
Pattern length	Y		Y		Y	
Waist to hip	Y		Y		Y	
Waist					Y	The ease has been added through the measuring
Sleeve length	Y		Y		Y	The ease has been added through the measuring

Theory of measuring and drafting in each method

Accordingly, the key elements of traditional women's dress patterns are very simple, flat and straight lines that demonstrate the capability and knowledge of the tailors in Bani Malik. Traditional pattern theory is based on a physical system whereby a woman would use her hand as a scale to measure the body and create a pattern for their family (see Figure 5). Analysis of this method used by

women shows that they had not developed any advanced methods for measuring the body. They used the width of the shoulder as the basis for constructing their patterns. Therefore, all of the members of the family would have the same size because they would follow the same system of measuring, especially the width of the neck based on the width of the maker. Clearly, it is not right to use the same size for all body shapes. This opinion is supported by (An ASBCI Technical Handbook, 2015) because no two people have the same shape and size of body in reality

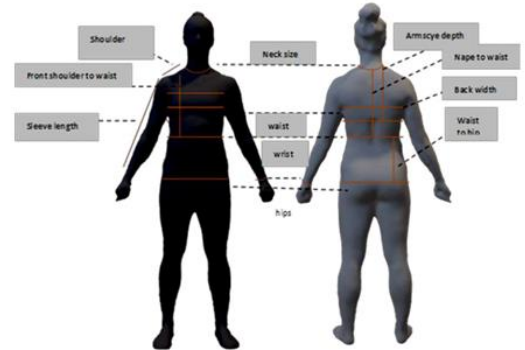


Figure 6 required measurements for modern methods, profili, 1949 and Alarich, 2015

(The images offer by size stream studio v5 2 8)



Figure 5 illustrated positions of the required measurements for body and sleeve by hand

(The images offer by size stream studio v5 2 8)

Current methods recognise the importance of using the body shape and measurements when drafting patterns and creating approaches based on individual body sizes using a tape measure as a unit of measurement and they define the body well (Profili, 1949; Aldrich, 2004). Gill (2011) indicated that existing methods have clearly defined ways of determining body dimensions. Therefore, the existing methods describe the dimensions of the body by numeric means (see Figure 6) and represent the pattern in 2D. Gill (2011: 228) also highlighted that pattern construction is the element that exerts the greatest influence over the dimensions of a garment.

Process of the proposed Sawwan pattern method

The pattern construction for the proposed method for the Sawwan garment is based on the previously analysed methods. This will provide a well-fitting garment for the wearer while respecting the original pattern makers of Sawwan garments. The suggested method for the Sawwan garment is the manual flat pattern modern theory to draft the Sawwan block and take measurements. Consequently, the elements of the Sawwan garment that have been focused on at this stage are:

- 1- Shaping the shoulder to match the slope line of the shoulder. Historically, people valued textiles because of their cost. Therefore, they did not cut their garments in ways to include too many details but today fabric is relatively cheap.
- 2- Added ease in the bust area to improve comfort because this part is tight in the Sawwan garment. Previously, makers would ignore the need for ease of movement in this area. Due to the Sawwan garment not being closely fitted, we do not need to add ease in this area.
- 3- Take the actual measurement of the neck size rather than using the hand width of the dressmakers.

4- Follow the Aldrich method to measure the length of the sleeve to achieve comfortable movement because the Sawwan method and Profili method take the sleeve measurement in a stretched hand and this affects the length and fit of the sleeve.

Therefore, this process ran in three phases (see Figure 7). First, take the required measurements manually from a size 12 Alvanon dress form using metric centimetres, as with other studies (Gill and Chadwick, 2009; McKinney et al., 2017). Manually draft and have it checked by an experienced pattern technician. The procedure involves amending any errors in the draft that may occur, signing off to correct it and taking steps to achieve the right result. Secondly, use a computer-aided design system (CAD) known as Lectra with a 2D pattern draft that was proposed for the Sawwan garment. Moreover, the CAD method was used to translate the draft and ensure that it achieved the same result as the manual approach. This stage required both an appreciation of how to draft patterns and how the system operates (Beazley and Bond, 2003). However, the pattern was constructed in a rectangular shape and the pattern in this block will be a half pattern for the front and back together. The rectangle is divided into two sections: the big part for the budn and the other for the side. The curves are achieved by selecting useful curved lines such as the neck and are placed within a rectangular pattern. The sleeve is a rectangle as well because the sleeve head of the Sawwan pattern is a straight line to match the armhole line. Finally, comparison was made between the manual draft and digital version by printing the electronic draft using a plotter device and matching against the manual draft for accuracy. If the two drafts do not differ by more than 2mm at any point, they will be accepted. If the discrepancy is larger, the digital draft will be amended to

match the original process of the proposed method for a sawwn garment

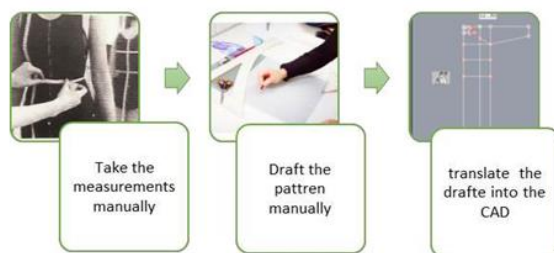


Figure 7 process of the proposed method of sawwn garment

RESULTS AND DISCUSSION

Sawwan garment approach

It is possible for the researcher to observe an expert with more than 25 years of experience throughout the process of making a sawwan garment. This clearly shows that Saudi women use few measures such as the span to take body measurements and construct patterns. It also explains how women drew the pattern for a traditional Saudi Sawwan garment directly onto the fabric to create the shape of the body. When putting the fabric against the body, the person being measured should stand normally and evenly on both feet.

ANALYSIS OF AN EXISTING TRADITIONAL SAWWAN PATTERN

Bani Malik's climate is moderate in summer and cool in winter when there is also considerable rainfall (Almalki, 2017). Therefore, this is reflected in the style of Sawwan garments. Furthermore, traditional women's costumes (Sawwan garment) were conservative because of the role that religion played in influencing their style. Examining the traditional

sawwan garment and the garments in the Bani Malik Hijaz region of Saudi Arabia reveals that they have a narrow neck with a slit, a bracelet sleeve to show jewellery, four panels, a floaty shape and are ankle length. The key components of the pattern cutting system for Sawwan garments are the budn, side, sleeves and gussets (see Figure 8).

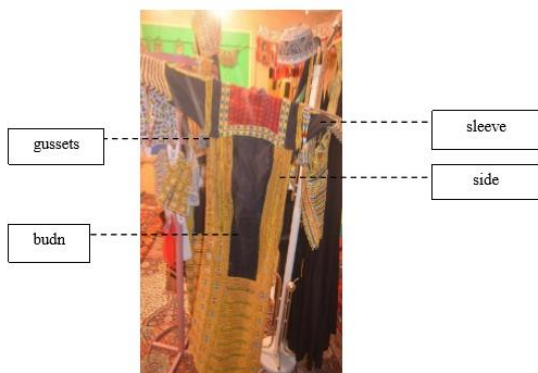


Figure 8 the image illustrates the key elements of Sawwan garment, the garment display by heritage museum in Bani Malik, 1958

1- Budn: This is defined as a sleeveless dress (Maqlan, 2007) and in this context is a section in the middle of the Sawwan covering the front and back. It is composed of rectangular pieces of fabric and is fitted at the shoulder but then falls straight to the ankle at the same width.

2- Side: Forms the side of the Sawwan, starting at the armpit and widening towards the end of the garment. Its shape varies from one region of Saudi Arabia to another.

3- Sleeves: Loose-fitting long sleeves attach to the underarm area by means of a Tekhrasa but narrow towards the wrist. There is a small hole that can be closed using a button fastening. In some cases, the sleeve may be mid-length if the wearer wishes to display jewellery.

4- Tekrasa (gussets): A piece under the armpit to provide comfort and movement.

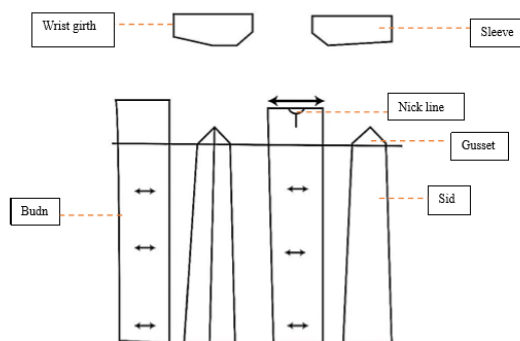












Figure 9 the scheme illustrates the pieces of traditional Sawwan pattern, 1958

The required measurements for the Sawwan garment draft process

Flat pattern making requires an accurate measurement to draft the form and the process must be approached carefully to produce a fitted garment. Modern methods were followed to determine the required measurements, position and to construct the garment pattern to draft the Sawwan garment.

Table 3 The table below shows the approach for the measurements required to draft a Sawwan garment and sleeve and also shows the position for the body and sleeve that could not be found in the traditional Sawwan measuring system and how this study replace study replaces the physical approach with a modern method (images sourced from Beazley, 1997)

Measurement	Illustrations
1-circumferences	
Front neck rise	
Back neck rise	
Front neck width	
bust circumference	
waist circumference	
hip circumference	
2-length	
Front shoulder to waist	
Nape to waist	
shoulder length	
Total length	

3-sleeve	
Top Arm	
sleeve length	
wrist girth	

Construction of the garment block in Lectra Modaris

This section demonstrates the instruction guide for the proposed Sawwan garment method using CAD to enhance the traditional Sawwan pattern to achieve a fashionable style that is acceptable to modern Saudi women.

Table 4 CAD and measurement data used to draft a Sawwan garment pattern

Sawwan garment draft (CAD)	Alva 12 Manual	Case	Measurements to use in Draft
Front neck depth	7.56	0	7.56
Back neck depth	1.5	0	1.5
Front & Back neck width	7.5	0	7.5
Bust circumference	89.8	3	92.8
waist circumference	71.8	0	71.8
Hip circumference	98	2.5	100.5
Waist to hip	20	0	20
A mscopy depth	21	0	21
Front shoulder to waist	40.5	0	40.5
Nape to waist	41	0	41
shoulder length	12.5	0	12.5
Total length	100	0	100
Top Arm	33.8	0	33.8
sleeve length	59	0	59
wrist girth	16	4	20
Garment front & back	Calculated Measurement	Calculations in draft	
create rectangular Horizontal Length = 1/4 total BC+ease.			
Vertical Length=actual length	89.8/4=22.45+4	26.45	
Back & Front Neck Depth= Actual measurement	F 7.56 B 1.5		
Back & Front Neck width =actual measurement	7.6	7.6	
Shoulder Length=actual length create point >F1			
>relative point far horizontal input the value of the actual length	12.5	12.5	

Side panel draw line from shoulder point just created F1>lines >parallel A mscye depth= F1 > lines>parallel click on the back neck depth point the input value a mscye depth+ease	21+2.5	23.5
Create waistline: Select the tool=F1> Lines > Parallel > then under back-neck depth point input the value for nape to waist measurement.		41
Hipline: Select the tool: F1 > Lines > Parallel		20
Create gus sets line F1> relative point then input the 1/3 armscye depth into the dy box.	21/3	7
Create cuff size F1> straight then square down from the end of the sleeve point 1/2 measurement of the wrist then press enter. Then complete the sleeve.	16/2=8+4	12

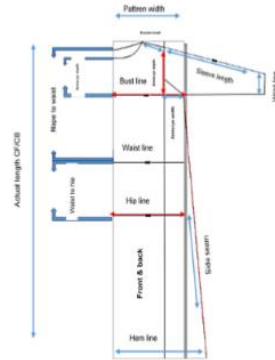


Figure 10 the Sawwan pattern that has been adopted to enhance the traditional Sawwan garment and the area that has been improved

Method adopted for Sawwan garment

- ❖ The measurements used to draft the Sawwan pattern have been taken using the Alva 12 dress form as an example.
- ❖ The ease allowances used in this method are the average amount applied in a modern method; e.g. Aldric and Profili.

The illustration below demonstrates the proposed Sawwan method and defines the area that creates added ease. The red lines show the area of ease which is the bust, hip and armscye circumference. Meanwhile, the blue lines show the key instruction for the draft such as the actual length front and back, the hemline, side seam and wrist line.

CONCLUSION

This investigation into the traditional Sawwan garment has revealed that it is part of the identity of the Bani Malik people and it narrates a myth inherited by generations. It is a source of pride for these people because of the values and implications it carries. Therefore, reviving heritage must be one of the objectives of developed societies. (Almalki, 2017) pointed out that studying the traditional costumes of nations helps to preserve them and spread them throughout the world by mixing their design with modern creative ideas and innovations that are compatible with the current world of fashion. The lifestyles of modern Saudis are far-removed from those of their parents and grandparents and, consequently, many women prefer readymade clothing instead of traditional handmade garments. This is a notable change in regions such as Bani Malik where clothes have traditionally been handed down from one generation to the next (Almalki, 2017). There is no formal documentation of clothes being inherited but it is widely acknowledged that this practice was commonplace (Almalki, 2017). Forney and Rabolt

(1997) state that the introduction of innovative technology often triggers a cultural response because modernization brings change. This paper is striving to achieve a new technique to enhance the Sawwan garment approach and ensure their design can be merged with modern offerings. However, this study has demonstrated the power of the contemporary and luxury lifestyles of Saudi women today and how modern style is finding a way to replace traditional garments.

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