

# Programme Quality, Students' Satisfaction and Their Word-of-Mouth: Is There any Relationship?

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**Abstract:** The purpose of this study was to investigate the relationships amongst programme quality, students' satisfaction and their word of mouth of senior secondary students in central province, Sri Lanka. This study was used a structured questionnaire which was distributed amongst 410 secondary school students studied Biosystems Technology in Central province of Sri Lanka and selected using stratified random sampling method. The inferential and descriptive statistics were used to analyze the data obtained. The results indicated that out of six dimensions of program quality, four were the significant predictors of students' satisfaction and also students' satisfaction was a significant predictor of students' word of mouth behavior. It has revealed that only the programme quality in subject content in major has direct, positive and significant impact on students' word of mouth. Furthermore, the analysis of indirect impact confirmed that programme quality in teachers' characteristics and also in school facilities and learning resources have an indirect, positive and significant impact on students' word of mouth via students' satisfaction. Therefore, empirical findings of this study provide a vital contribution to the body of knowledge whilst it provides useful insights for the policy makers and relevant personnel in general education sector.

**Keywords:** Quality of programme, students' satisfaction, word of mouth, dimensions, senior secondary students, biosystems technology programme.

**Citation:** Katukurunda, K.G.W.K., Mohd Shukri Ab. Yajid., Ali Khatibi and Ferdous Azam, S.M. 2018. Programme Quality, Students' Satisfaction and Their Word-of-Mouth: Is There any Relationship?. International Journal of Recent Innovations in Academic Research, 2(8): 246-265.

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## 1. Introduction

In competitive environment, Sri Lanka is moving fast towards its development strategies, where the country needs a competent workforce. However, the unemployment amongst the art graduates are critical hindrance. It is happening due to the higher number of students' enrolment into the art stream at the Sri Lankan Senior Secondary Stage (Advanced Level) of education (International Labour Organization (ILO), 2013). Therefore, Sedera (2010) emphasized that comprehensive education reforms in secondary stage would be more significant. In the year 2013, the government has made great effort to mitigate this oversupply of art graduate into the country's' workforce by implementing Biosystems Technology under new curriculum stream at the senior secondary stage (MOE, 2013; MOE, 2014) where by the relevant policy makers were hoped to minimize the students' enrolment

into the art stream up to 25 per cent. Thus, higher number of students' enrolment into Biosystems Technology is more important. Such that, though Ministry of Education and National Institute of Education have been conducted a number of awareness and popularizing programmes to the relevant stakeholders in order to uplifting the students' enrolment, unexpectedly number of students' enrolment has dropped in the year 2015 (MOE, 2015; NIE 2015). In previous studies. it was reported that there could be various factors that effect on making such an environment trends (Letcer and Neves, 2012; Sinclaire, 2014, Danjuma *et al.*, 2014). Thus, there were many studies found the factors that were considered as important by the students in such enrolment trends and to ascertain the relationship between programme quality and students' enrolment trend. In the sense, previous studies, emphasized that programme quality is a key factor which influence students', decision making (Danjuma *et al.*, 2014; Sinclarire, 2014). Furthermore, Dunog (2015) and sinclaire (2014) emphasized that students' satisfaction is a key determinant of the quality of programme. On the other words, students' satisfaction can use to assess the programme quality (Sinclaire, 2014) But, Biosystems Technology is new discipline to Sri Lanka and consequently scant or limited studies have been conducted to investigative the students' satisfaction with Biosystems Technology programme.

Therefore, this study was aim to investigate the relationships amongst the programme quality, students' satisfaction and word of mouth where a doubt has appeared with above enrolment trend; Is there any relationship amongst the programme quality, students' satisfaction and word of mouth?

In fact, this paper presented the background of study under the section of introduction. Secondly, it has paid attention on reviews of past studies and methodology adapted. Thirdly, this paper has focused on data analysis, discussion and conclusion to be made. Furthermore, it ends up with the implications that useful for the relevant personnel in order ensure the quality of programme since satisfied students more likely to express their word of mouth in positive way to the closer friends and relatives (Leonnard, 2017).

## 2. Literature Review

### 2.1 Word of Mouth

What does mean by word of mouth? In consumer marketing, word of mouth is the statement which delivered either in personally or non-personally by anyone to customer (Dora, 2016). Thus, word of mouth is a behavioral intensions expressed by someone who were satisfied or dissatisfied. In the sense, if any one satisfied with the product or service, consequently intention to spread positive word of mouth whilst dissatisfied customer spread negative word of mouth to relatives and friends (Leonnard, 2017).

On the other words, customers having less perceived experiences, intent to spread negative word of mouth. In fact, increasing word of mouth in positive way, could provide effective influence on the service or product (Dora, 2017). In the sense of word of mouth, its impact on customer decision making has being investigated in marketing context for last three decades since it was identified as a key factor that influence purchasing behavior. Indeed, Katz and Lazarsfield (1995) identified that word of mouth is seven times effective that advertising in newspapers and magazines. But, in education setting, studies focused on power of word of mouth are limited though studies have been focused on course or college choices. Thus, word of mouth power cannot be neglected when student make decision to select elective courses (Sever, 2009). Review of literature evident that influence of word of mouth on customer decision making has been investigated for many years. But, studies related to the general

education especially in the secondary stage are very limited, not only that, even in other countries of the world.

Comparatively, in education setting, the consequences of students' satisfaction do not line with other industries in most countries since it's non-profitably nature. Furthermore, comprehensive reviews of literature emphasized that loyalty, complaint behavior; repetitive purchasing behavior and word of mouth are the consequences of students' satisfaction. In education setting, word of mouth is an effective medium of recommending existing programme to friends whilst it is a force for encouraging students to apply a particular programme. Thus, word of mouth towards programme quality is very important phenomena where students' enrolment into programme is considered. Similarly, Naik *et al.*, (2010) reported that behavioral intention and word of mouth are not two concepts. Indeed, word of mouth is a dimension of behavioral intention. However, Sever, (2009) pointed out that word of mouth influences the students' choices in college courses.

Jillian *et al.*, (2005) highlighted that negative word of mouth spread by the dissatisfied customer than the satisfied customer. In contrast, dissatisfied customer tends to more word of mouth expression that compare to the customers who were satisfied. Furthermore, customer satisfaction has identified as key antecedent of word of mouth (Neumann, 2015). In the sense, it has noticed that customer satisfaction is a key driver of word of mouth. There are two types of word of mouth namely traditional word of mouth and electronic word of mouth (e-word of mouth). However, influence of e-word of mouth was less than the traditional word of mouth which is more effective in making enrolment decision into programme.

## 2.2. Quality of Programme

What is the quality? It is hard to define. In education setting, the past studies emphasized that quality can be categorized into two aspects; academic quality and service quality where some studies elaborated that academic quality as the curriculum quality (Hossain *et al.*, 2018) whilst curriculum offered to the students denoted as academic programme (Farahmandian *et al.*, 2013). Numerous studies have made effort to define quality in students' perspectives in terms of students' perceived experiences. Perceived quality usually depends on the actual academic programme, for an example it conceptualizes as programme's content, teaching quality, facilities available at educational institutions. Hence, the quality can be conceptualized based on perceived quality (Sumaedi, 2011). The academic institutions such as college, universities are considered that the students' satisfaction is a key criterion in measuring the quality of educational courses, curriculum or programmes (Kuo *et al.*, 2013). On the other words, quality of the programme is a significant contributor to satisfaction with their study programme (Espinoza *et al.*, 2018).

Perceived quality of programme is therefore considered as students' authentic evaluation towards the programme which based on students' perceived experiences in their school career (Athiyaman, 1997). Satisfaction literature emphasized that programme quality is a key antecedent of students' satisfaction and students' word of mouth where student enrolment in to programme is considered (Serenko, 2010). Thus, many studies have been elaborated that programme quality as students' subjective evaluation of a programme (Zakaria *et al.*, 2016) since its abstract in nature. Zakaria *et al.*, (2016) described that programme quality has influenced by different dimensions whilst Zakaria & others highlighted that perceived programme quality is an evaluation of programme as perceived by the students and influenced by several dimensions. Grace *et al.*, (2015) focused programme quality and conceptualized in five dimensions. Similarly, Tessema *et al.*, (2012) were considered 11

dimensions of quality of curriculum. Peng and Samah (2006) focused on the quality of education where eight dimensions were identified as determinant of programme quality. Kanon and Baker (2006) conducted a study to explore the academic programme offered. The results revealed that academic programmes have significant impact on the satisfaction as perceived by the students.

In short, according to above reviews, Programme quality can explain as a multidimensional construct. In this study, programme quality was conceptualized as students' perceived experiences with the quality of Biosystems Technology programme.

### 2.3. Students' Satisfaction

In the academic setting, students' satisfaction is reflected by different factors as its multidimensional nature (Weerasinghe and Fernando, 2017). Thus, students' satisfaction has been conceptualized in different ways. In fact, some studies conceptualized it as satisfaction with curriculum (Tessema *et al.*, 2012), satisfaction with undergraduate programme (Letcher and Neves, 2010; Bauer, 2015; Ramos *et al.*, 2015), satisfaction with service quality in higher education (Hasan *et al.*, 2008), satisfaction with demographic characteristics (Tessema *et al.*, 2012), satisfaction with college courses or quality of course (Sinclair, 2010; Thapliyal, 2014), satisfaction with online courses (Davis, 2014) and satisfaction with campus climate (Duong, 2016) etc. Thus, the term of students' satisfaction has been conceptualized in different dimensions as a diversified phenomenon. Sinclair, (2014) has been pointed out that students' satisfaction is coupled with academic performance, learning and recruitment of future students though students' satisfaction defined by Tessema *et al.*, (2012) as "the extent to which students are satisfied with number of college related-issues such as quality of instruction, course availability, and class size" (p.35). But, Elliot and Healy, (2001) argued that students' satisfaction as short-term attitudes earning from experiences in education provided, meaning that satisfaction can be changed according to their experiences earned in the academic environment. On the other hand, students' satisfaction elaborated by Letcher and Neves, (2010) as the "favorability of a students' subjective evaluations of the various outcomes and experiences associated with education" (p. 3).

In sum, numerous studies have found in the satisfaction literatures as it relates to the students' satisfaction with various academic oriented issues. Many of them emphasized that more satisfied students are likely to continue their studies and consequently completed their programme of studies in success (DeShields *et al.*, 2015). Some studies indicated that satisfied students have rated their perceived experience to the satisfaction as negative way. However, satisfied students are likely to committed positively about their studies, courses and institutions and to continue their studies through daily attending classes.

Studies have conducted to assess students' satisfaction for many reasons. Some studies focus on the effectiveness or responsiveness of college or universities' curriculum or programmes. Several studies emphasize on the student retention, persistence or attrition. Some are measured students' satisfaction regarding services given by the academic institutions such as colleges, universities or faculties (Tessema *et al.*, 2012). But, limited studies have found in the satisfaction literatures as it relates to the programme quality, students' satisfaction and their word of mouth with respect to Biosystems Technology. The colleges, universities and other academic institutions (e.g. secondary schools) are concerned that the students' satisfaction is one of the core criterion in measuring the quality of educational courses, curriculum or programmes in the changing world where concerned the needs of society and demands of employees (Kuo *et al.*, 2013). However, many researchers have been given less

attention on the secondary education with reference to the students' satisfaction though little number of studies has found in the satisfaction literatures in general education in terms of school education.

#### **2.4. Perceived quality of programme, students' satisfaction and their word-of-mouth (WOM)**

In reviews of past studies, it has clearly confirmed that there are many kinds of relationships exist amongst these constructs of interest.

##### **2.4.1. Perceived programme quality and students' satisfaction**

In the sense of programme quality and students' satisfaction, James and Casidy (2018) focused on the impact of assessment on students' satisfaction and their word-of-mouth. The sample was 120 business studies undergraduates. The results drawn from the statistical analysis revealed that assessment and evaluation were positively significant with the students' satisfaction. Thus, assessment influence the students' satisfaction in positive way. Therefore, it concluded that the fair assessment encourages the students' satisfaction with business programme.

Zakaria *et al.*, (2018) have examined the impact of service quality on the students' satisfaction at a state university in Malaysia where responsiveness, assurance and empathy dimensions of service quality focused on the teachers' characteristics and their behaviour. The results confirmed that service quality and students' satisfaction in physical facilities were positively and significantly correlated with the students' satisfaction while the results of regression analysis confirmed that assurance ("knowledge and courtesy of the teaching staff and their ability to inspire trust and confidence", p.491) and empathy ("caring individualized attention the teaching staff provides to the students, p.491) have positively significant influence on the students' satisfaction. Thus, it has confirmed that service quality in assurance, and empathy were the significant predictors of students' satisfaction. Similarly, Sooriyabandara and Premkumar (2017) did a study on factors affecting students' satisfaction of private higher educational institutions. The questionnaire was distributed among the business management undergraduate students of private higher education institutes in Sri Lanka. The findings revealed that there is no any relationship between the facilities, quality of teaching and skill match though other two independent variables indicated as significant and positive impact on students' satisfaction. In fact, the results indicated that insignificant factors such as facilities, quality of teaching, and skill match were not the predictors of students' satisfaction.

Examining critical factors affecting on Sri Lankan higher education was conducted by Weerasinghe and Fernando, (2017) where 5,320 undergraduate students were included in the sample. The results drawn from regression analysis emphasized that university image, facilities, academic programme offered were positively, significantly related with the students' satisfaction. But, quality of the academic staff (teachers' characteristics and behaviour) was insignificant with the students' satisfaction.

In similar study, Zakaria *et al.*, (2016) explored the factors affecting on students' satisfaction with programme offered by a private university where the classroom environment, lecturer (or instructor), college facilities and services, methods of grading (independent variables) were the predictor variable. The results of regression analysis indicated that all the variables except lecturer, all other independent variables have impact on students' satisfaction. Indeed, it was indicated that one of the most important predictor of students' satisfaction was methods

of grading. However, lecturer (or instructor) was not a significant predictor of students' satisfaction. Thus, fair methods of grading encourage the students to select the academic programme. Long *et al.*, (2014) has explored the relationship between lecturers' competencies and students' satisfaction in a Malaysian private college. One is there is a relationship between lecturers' competencies and students' satisfaction. The sample consisted of 260 students, who drawn from stratified random sampling method. The results of regression analysis confirmed that there is a positive and significant relationship between lecturer competencies in subject knowledge, clarity of presentation, interaction with students, teaching creativity and lecture notes and students' satisfaction where lecturer's subject knowledge was the most significant predictor of students' satisfaction. Conversely, Hill *et al.*, (2003) highlighted that key factor of teaching quality was lecture delivering and interaction with students in the classroom.

Seng and Ling (2013) investigated the impact of education service quality on business school students' satisfaction as perceived by Malaysian higher education students. The service quality was here conceptualized with five dimensions as academic courses, students' engagement, instructors and learning resources and assessment. The results revealed that academic courses, instructors, students' engagement and learning resources were significant predictors of students' satisfaction. Similarly, Tessema *et al.*, (2012) did a study to examine the factors affecting college students' satisfaction with major curriculum which was a longitudinal study at Midsized Public University, U.S.A. The sample size was 6,602 students and electronic survey was conducted during 2001-2009 period as a longitudinal study where 11 antecedents of students' satisfaction namely quality of instruction, major course content, required course availability for major, variety of courses, academic advising, preparation for carrier or graduate schools, capstone experiences, and class size of major courses, courses availability of elective in major, grading in major courses. were positively correlated with satisfaction with major curriculum offered.

Grace *et al.*, (2012) conducted an empirical study to investigate the relationship between the perceived programme quality and students' satisfaction where the course experience questionnaire (CEQ) was used to obtain students' perceived experiences. The respondents were selected by using convening sampling method. Perceived quality of programme conceptualized with five dimensions which included good teaching standards of programme, appropriate assessment and appropriate workload. The results indicated that perceived programme quality in good teaching and standards have a direct impact on generic skills efficacy and students' satisfaction with bachelor degree in business while appropriate assessment and workload do not have direct influence on both of the outcome variables. In fact, it was confirmed that perceived programme quality in appropriate assessment system was not a significant predictor of students' satisfaction.

In another study, Malik *et al.*, (2010) undertook a specific study on higher educational institutes of Pakistan where it has focused that the impact of services quality dimensions on students' satisfaction. The results from structural equation modeling have revealed that service quality dimensions have a positive, significant impact on students' satisfaction. Indeed, the tangible facilities like libraries, laboratories, lecture room, other infrastructures needed for successful learning and teaching and class layout and class setup (classroom environment) and decoration of furniture's were the most influential predictors of students' satisfaction with the service provided. The results also indicated that students' satisfaction was influenced by service quality in different dimensions in terms of the quality of teaching and learning environment of educational institutions. The quality of teaching conceptualized

here the teachers who are knowledgeable, experts in subject matters, "liberality" and "understanding with course with friendly attitude of teaching" (P.7).

Sinclair (2010) explored the students' satisfaction with college courses. 560 undergraduate students were asked to rate their attitudes related to different course characteristics such as College facilities, classroom, characteristics, course content, and faculty characteristics (instructor characteristics and behaviour) methods of instruction, methods of grading and learning technology. The results indicated that faculty characteristics, interaction characteristics (i.e. methods of instruction, methods of grading) were the most significant predictors of satisfaction with college courses.

#### **2.4.2. Students' satisfaction and their word-of-mouth (WOM)**

In education setting, word of mouth is a key consequence of students' satisfaction with programme. In the sense, numerous studies have been identified that the students' satisfaction was directly impact on the students' word of mouth (Soderlund, 1998; Alves and Raposos, 2007; Luis, *et al.*, 2008; Serenko, 2010; Ryu, *et al.*, 2011; Teerawut, 2011).

In fact, Austin and Pervaiz, (2017) investigated the impact of students' satisfaction on students' word-of-mouth, since past studies reported that students who satisfied more tend to spread positive word-of-mouth and lead to attracting many students to educational institutions. The sample was the college students of Pakistan and 2,309 students were participated. Indeed, students' satisfaction was considered as predictor variable which conceptualized as satisfaction with college administration, discipline and values, courses and instruction, college facilities etc., which was a multidimensional construct. The findings revealed that college facilities and faculty were not significant with students' loyalty and word-of-mouth though other satisfaction factors were positively and significantly related with students' loyalty and students' word of mouth where the courses and instruction was the most influential factor on students' loyalty and word-of-mouth. On the other words, higher the quality of courses and instruction, students more tend to spread word-of-mouth in positive way to closer friends.

Leonard, (2017) has made effort to investigate the impact of satisfaction and reputation on word-of-mouth, because with increasing number of higher education institutions, universities need to confirm the students' satisfaction to attract many students to their institutions. The sample included 350 undergraduate students and drawn from stratified random sampling method. The results revealed that students' satisfaction has high significant impact on students' word-of-mouth whilst comparatively reputation has a low impact on students' word-of-mouth. Thus, this study confirmed that with higher the satisfaction, higher the word-of-mouth in positive way and then attract many students to the educational institutions. Conversely, Manson *et al.*, (2014) explored the impact of service quality on students' satisfaction and its consequences in terms of loyalty and word-of-mouth where service quality was the antecedents of students' satisfaction. Furthermore, this study also analyzed the mediating effect on students' satisfaction between service quality and consequences of satisfaction. The results revealed that the physical facilities have strongly influenced on students' satisfaction while the word-of-mouth has impacted by the students' satisfaction.

Luis *et al.*, (2013) investigated the influence of website usability on customer satisfaction and customer loyalty and positive word-of-mouth in e-banking context. The findings revealed that customer satisfaction had a positive impact on loyalty and positive word-of-mouth whilst website usability was an indirect antecedent of loyalty, WOM. Thus, customer satisfaction

was performed here as an intervening variable between website usability and customer loyalty and WOM and further indicated that a strong impact of website usability on customer satisfaction.

Li, (2010) conducted a study to investigate the impact of perceived service quality on word-of-mouth towards private universities in Taiwan. Of which, it was found that students' satisfaction has no direct impact on WOM, though service quality was influenced on students' satisfaction. However, the findings indicated that satisfied students were created WOM. In fact, this finding is not consistent with the conclusion made by Serenko (2010). It also implies that students' satisfaction must go across the loyalty to influence on WOM. Similarly, Serenko (2010) conducted an empirical study to ascertain the antecedents and also consequences of students' satisfaction with music programme in Canadian University where programme quality, perceived value and prior expectations were the antecedents of students' satisfaction while perceived loyalty, word-of-mouth, students' complaints, tuition fee change to tolerance were the consequences of students' satisfaction. The results revealed that students' satisfaction increased the positive word-of-mouth towards university music programme.

#### **2.4.3. Programme Quality and Students' Word of Mouth**

Despite there has been a number of studies examined that how students' satisfaction influenced by programme quality and also its effects on students' word of mouth, very limited studies have been described the direct effect of student word of mouth upon programme quality. James and Cassidy (2018) explored the impact of assessment on the students' satisfaction and on word-of-mouth towards the programme of study. The findings indicated that a positive, significant relationship has established between the assessment and students' satisfaction with business programme. Thus, this finding provide an insight to the relevant authorities how does assessment of a programme influence the students' word-of-mouth behaviour. In similar study, Mansori *et al.*, (2014) examined the impact of service quality on satisfaction and its consequences in private universities, colleges in Malaysia.

The results confirmed that the physical facilities (tangibility) was significant predictor of students' satisfaction whilst the tangibility has significant and direct impact on students' loyalty (students' intention to continue the studies) and spreading word-of-mouth to their closer friends. It was also found that service quality in tangibility has the significant indirect impact on both students' loyalty, and word-of-mouth, where satisfaction has played as mediator between service quality in tangibility and loyalty, and word-of-mouth. The study conducted by Palmer, (2011) identified that the subject content in major was directly influenced on the students' word of mouth. Sever, (2009) found that subjects' availability for electives, methods of assessment and evaluation have directly effect on students' word of mouth whilst teachers' characteristics was not direct significant on students' satisfaction. However, skill of teacher has a negative, significant impact on students' word of mouth (Teerawut, 2011). The school facilities and learning resources has a direct significant impact on students' word of mouth (Mansori, *et al.*, 2014) though Li, (2013) found that school facilities and learning resources has no direct significant impact on students' word of mouth.

#### **2.4.4. The Mediating Effect of Students' Satisfaction on Programme Quality and Students' Word of Mouth**

In reviews of previous studies, limited studies have been found that the association between perceived quality and students' word of mouth was mediated by students' satisfaction (Alves and Raposos, 2007; Teerawut, 2011; James and Casidy, 2018). Furthermore, Soderlund



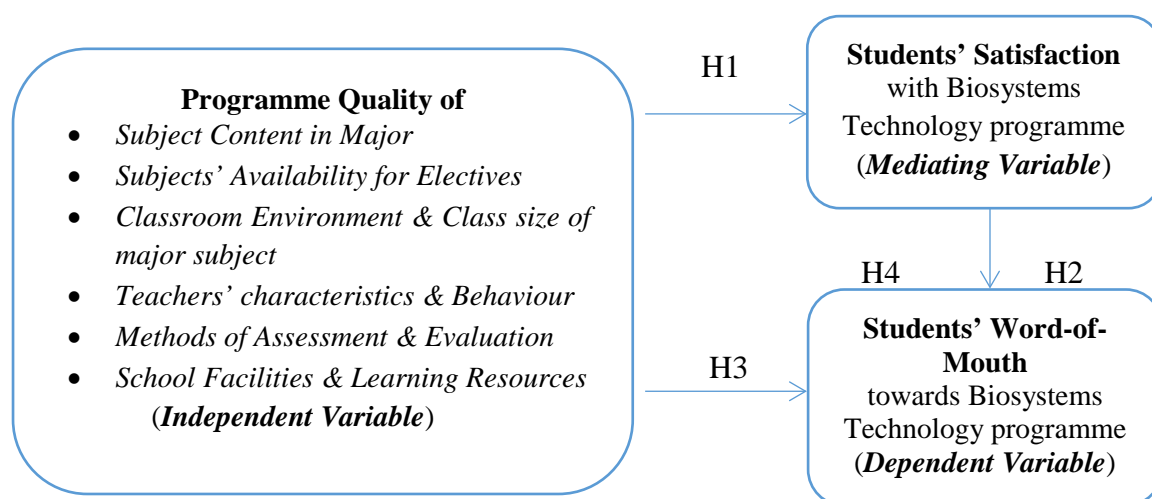
(1998) emphasized that the association between programme quality and students’ word of mouth was related to the satisfaction.

In fact, James and Casidy (2018) examined the indirect impact of assessment on students’ word-of-mouth via students’ satisfaction which was a mediator. The results revealed that there was an indirect relationship between assessment and students’ word-of-mouth. In fact, assessment is a significant predictor of students’ word-of-mouth behaviour where students’ satisfaction is a central phenomenon. Mestrovic, (2017) explored the relationship amongst the service quality, students’ satisfaction and word-of-mouth where it is identified the indirect effect of students’ satisfaction on service quality in teaching staff, equipment, teaching syllabus, and environment etc, and the word-of-mouth. The results reported that perceived service quality has an indirect, positive and significant influence on the students’ behavioural intentions (WOM) via students’ satisfaction. The association between physical facilities and word of mouth was fully mediated by student satisfaction (Jiewanto, 2012; Mansori, 2014).

Similarly, the study carried out by Teerawut (2011) found that students’ satisfaction mediated the relationship between knowledge of teacher in terms of pedagogy content knowledge and subject content knowledge and students’ word of mouth.

### 2.5. Conceptual Framework

The conceptual framework of this study is depicted in Figure 1.1, which presented the relationships amongst the programme quality, students’ satisfaction and students’ word of mouth towards programme of study, based on the previous studies and discussion made with the experts in both contexts of education and Biosystems Technology.



**Figure 2.5.1. Conceptual framework for the relationship amongst independent variable (programme quality), dependent variable (students’ word of mouth) and mediating variable (students’ satisfaction).**

In fact, based on the extensive reviews of previous studies, four main hypotheses were developed in order to investigate the relationships amongst the different variables where there were four main hypotheses and 16 sub hypotheses as below.

**H1: The programme quality (P.Q) has a positive and significant impact on the students’ satisfaction with Biosystems Technology programme (SSBST).**

H1a: P.Q. in subject content in major (SCM) has a positive and significant impact on the SSBST.

H1b: P.Q. in subjects' availability for electives (SAEM) has a positive and significant impact on SSBST.

H1c: P.Q. in classroom environment and class size (CECS) has a positive and significant impact on SSBST.

H1d: P.Q. in teachers' characteristics & behavior (TCB) has a positive and significant impact on SSBST.

H1e: P.Q. in methods of assessment & evaluation (MAE) has a positive and significant impact on SSBST.

H1f: P.Q. in school facilities & learning resources (SFLR) has a positive and significant impact on SSBST.

**H2: The students' satisfaction with Biosystems Technology programme has a positive and significant impact on students' word-of-mouth (SWM).**

**H3: The programme quality has a direct, positive and significant impact on the students' word of mouth.**

H3<sub>a</sub>: P.Q. in SCM has a direct, positive and significant impact on SWM.

H3<sub>b</sub>: P.Q. in SAEM has a direct, positive and significant impact on SWM.

H3<sub>c</sub>: P.Q. in CECS has a direct, positive and significant impact on SWM.

H3<sub>d</sub>: P.Q. in TCB has a direct, negative and significant impact on SWM.

H3<sub>e</sub>: P.Q. in MAE has a direct, positive and significant impact on SWM.

H3<sub>f</sub>: P.Q. in SFLR has a direct, positive and significant impact on SWM.

**H4: The students' satisfaction with Biosystems Technology (SSBST) mediates the relationship between programme quality (P.Q.) and students' word-of-mouth (SWM).**

H4a: SSBST mediates the relationship between P.Q. in SFLR and SWM.

H4b: SSBST mediates the relationship between P.Q. in TCB and SWM.

### 3.0. Research Methodology

The research design adapted for this study was a quantitative survey which was employed to investigate the relationships amongst the programme quality dimensions, students' satisfaction and students' word of mouth towards Biosystems Technology programme. The instrument (a structured questionnaire) used for this study was based on the extensive review of the past studies and informal discussion made with relevant stakeholders. This questionnaire consisted of four parts: students' demographic information, programme quality students, signification, and students' word of mouth where these constructs were measured using 5-point Likert scale which ranged from strongly agreed (1) to strongly disagreed (5).

The study population for this study was the senior secondary students studied Bio-systems Technology in central province of Sri Lanka, in year 2013 and 2014. The total sample size of this study was 410 students where it was decided by considering response rate in 70 per cent and drawn from the study population by using stratified random sampling method. Therefore, questionnaire was distributed to 410 students whereby 325 questionnaires were returned and indicated 74 per cent useable response rate. On the other words, the sample was accepted, because minimum sample size for this study was 313 as recommended by Sekaran and Bougie, (2010). Since the items in the questionnaire were adopted and adapted, a pilot test was performed in order to ensure the validity and reliability of the questionnaire where 50 students were selected and advised to read carefully each item and rate their perceived experiences to the statement given in the instrument. Beside to that, the content validity was evaluated by the eight experts in both fields of education and Biosystems Technology. In both parties, it has been requested to comment on statements which were not clearly

understood where few wordings used in the instrument has been modified to validate the instrument. Subsequently, reliability test was performed by using Cronbach's alpha test and established the internal consistency reliability as alpha values of each constructs were higher than 0.7 (Zikumard *et al.*, 2010).

#### 4.0 Data analysis and Results

In this study, the data collected was analyzed by using SPSS version 21.0 where the inferential and also descriptive statistics were applied to ascertain the relationships amongst the constructs of interest.

#### 4.1 Descriptive Statistics

In Table 4.1, it has clearly indicated that the mean values of each dimensions and constructs varied from the lowest 3.3339 to the highest 3.9980. However, Kline, (2005) suggested that univariate normality can be accepted if the skewness value of each variable should not exceed three whilst kurtosis value should not exceed ten. Thus, the skewness and kurtosis values were within the recommend range (Chinna *et al.*, 2012).

**Table 4.1. Descriptive Statistics**

Construct(s)	Mean	Std. Deviation	Skewness	Kurtosis
SCM	3.7742	.50633	-1.046	1.143
SAEM	3.8729	.58398	-.636	.879
CECS	3.6560	.69259	-.857	1.042
TCB	3.8869	.51502	-.905	1.192
MAF	3.6801	.58606	-1.074	1.012
SFLA	3.3339	.59526	-.406	-.296
SSBST	3.9980	.42445	-.415	1.088
SWM	3.8451	.45432	.063	1.108

Source: Survey Data, 2016/2017

#### 4.2 Regression Analysis

In regression analysis, four main hypotheses (H<sub>1</sub>, H<sub>2</sub>, H<sub>3</sub> and H<sub>4</sub>) were tested in order to investigate; Is there any relationship amongst the constructs of interest? Firstly, the regression analysis was performed to ascertain the impact of programme quality dimensions on students' satisfaction (H<sub>1</sub>; H<sub>1a</sub>–H<sub>1f</sub>). The results of multiple regression analysis are depicted in Table 4.2 which clearly indicated that how do dimensions of programme quality impact on students' satisfaction.

**Table 4.2. Results of multiple regression analysis on impact of programme quality on students' satisfaction (N=325)**

Model		Unstd. Coefficient		Std. Coefficient	t	Sig.	Collinearity	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.683	.202		8.366	.000		
	SCM	.211	.040	.252	4.720	.000	.743	1.346
	SAEM	.209	.036	.287	5.777	.000	.855	1.170
	CECS	.075	.034	.122	2.223	.027	.704	1.420
	TCB	.011	.044	.014	.255	.797	.739	1.353
	MAE	.036	.045	.049	.802	.423	.557	1.798
	SFLR	.078	.039	.110	1.993	.047	.696	1.437
2	(Constant)	1.714	.186		9.213	.000		

	SCM	.223	.043	.266	5.224	.000	.813	1.231
	SAEM	.216	.035	.297	6.121	.000	.895	1.117
	CECS	.093	.036	.130	2.568	.011	.824	1.213
	SFLR	.082	.032	.133	2.521	.012	.756	1.323

a. Dependent variable: SSBST;  
(Source: Survey Data, 2016/2017)

Table 4.2 indicated out of six dimensions of programme quality, P.Q. in SCM, SAEM, CECS and SFLR were significant predictors of SSBST since p-values less than 0.05. However, the p-values for TCB, MAE are more than 0.05, indicating as insignificant predictors of SSBST. In fact, students' satisfaction depends on P.Q. in SCM, SAEM, CECS and SFLR. In the other words, independent variables; TCB and MAE ( $p > 0.05$ ) cannot be used to predict SSBST.

In Table 4.2, the highest VIF value is less than 5, indicating that there is no problem of multicollinearity (Sekaran and Bougie, 2010). The R square value is 0.328, which means 33% of the variation in SSBST is explained by P.Q. about SCM, SAEM, CECS and SFLR. The Durbin-Watson statistics of variables is not far from 2, which indicates that there is no problem of autocorrelation (Chinna, 2012).

Secondly, regression analysis was performed to determine the impact of students' satisfaction on students' word of mouth towards Biosystems Technology (H2). The results presented in Table 4.3 which is clearly indicated that students' satisfaction was a significant predictor of students' word of mouth since p-value less than 0.05. On the other words, students' satisfaction has positive, and significant impact on students' word of mouth.

The R square ( $R^2 = 27.2\%$ ) indicates that students' satisfaction explain 27.2% of variance in determining students' word of mouth towards Biosystems Technology programme. On the other words,  $R^2$  reported that 27.2% of the variation on students' word of mouth was explained by the variation of students' satisfaction. The Durbin-Watson statistics of 1.693 is not too far from 2, indicating that there is no possibility of autocorrelation. There is no problem of multicollinearity, since the VIF value observed in Table 4.3 is below 5. In brief, this finding was consistent with Soderlurd, 1998; Alves and Rapaso, 2007; Luis *et al.*, 2008; Serenko, 2010; Ryu *et al.*, 2011; Teerawut, 2011.

**Table 4.3. The results of regression analysis for SWM upon SSBST**

Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
Constant	2.546	.181		14.099	.000		
SSBST	.369	.045	.415	8.204	.000	1.000	1.000

Dependent Variable: SWM  
(Source: Survey Data, 2016/2017)

Thirdly, regression analysis was performed further to examine the impact of programme quality dimensions on students' word of mouth behavior (H3). The results of coefficients analysis were depicted in Table 4.4.

**Table 4.4. The results of regression analysis for students’ word of mouth (SWM) upon program quality**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
Constant	2.999	.208		14.382	.000		
SCM	.188	.046	.253	4.069	.000	.743	1.346
SAEM	.055	.037	.085	1.746	.141	.855	1.170
CECS	-.010	.041	-.019	-.295	.768	.704	1.420
TCB	.012	.046	.016	.253	.800	.739	1.353
MAE	-.025	.046	-.038	-.535	.593	.557	1.795
SFLR	.055	.041	.086	1.347	.179	.696	1.437

Dependent Variable: SWM  
(Source; Survey Data, 2016/2017)

Table 4.4 revealed that programme quality in SCM was the only significant predictor of students' word of mouth behavior since the  $p$ -value less than 0.05. But, other dimensions of programme quality such as SAEM, CECS, TCB, MAE, and SFLR were not significant predictors of students' word of mouth because  $p$ -value were more than 0.05. On the other words, only the program quality in SCM was positively, significantly influence in changing students' word of mouth behavior whilst other dimensions of programme quality cannot use for explaining students’ word of mouth.

Indeed, programme quality in SCM can be used to model the students' word of mouth towards Biosystems Technology programme, though programme quality in SAEM, CECS, TCB, MAE and SFLR cannot use to predict students' word of mouth behavior since those dimensions of programme quality were insignificant ( $P > 0.05$ ). Further, the results (Table 4.4) emphasized that programme quality in SAEM, CECS, TCB, MAE and SFLR do not have an importance on changing the word of mouth behavior towards Biosystems Technology programme. It means that programme quality dimensions except SCM must go through the satisfaction first and then to create (indirect effect) word of mouth (Li, 2012). In sense, this finding was in line with Palmer, 2011. In Table 4.4, the R square value is .250, which means 25% of the variation in SWM is explained by P.Q. about SCM. In the sense of  $R^2$ , Cohen (1998) reported that  $R^2$  values greater than 0.26 ( $\geq 0.26$ ) is as substantial, 0.13 ( $\geq 0.13$ ) as moderate and 0.02 ( $\geq 0.02$ ) as weak. The Durbin-Watson statistics is not far from 2 (1.824), which indicates that there is no autocorrelation issue (Chinna and Yuen, 2016).

In Table 4.5, it is clearly presented that how did students’ satisfaction mediate the association between programme quality dimensions and students’ word of mouth where once regression analysis run, it could be fulfilled the three conditions suggested by Baron & Kenny and subsequently run Sobel’s test. The results empirically revealed that students’ satisfaction mediates the relationship between programme quality in TCB and students’ word of mouth. Therefore, outcome of mediating analysis confirmed that H4(a) has established. The same analysis was performed for the hypothesis H4(b) in terms of students’ satisfaction mediates programme quality in SFLR and students’ word of mouth. The results confirmed that this hypothesis has also established. Thus, students’ satisfaction was emphasized that its mediation effect as such. These findings were consistent with Nilk *et al.*, 2011; Terrawut, 2011; Jiewanto, 2012 and Mansori, 2014.

**Table 4.5. The results of mediated analysis**

Effect of pro. quality in;	Computation of indirect effect				Z	p-value
	on students' satisfaction (SSBST)*		on students' word of mouth** (when presence of SSBST)			
	B	Std. Error	B	Std. Error		
school facilities and learning resources (SFLR)	.219	.038	.365	.047	4.6280	.000
teachers' characteristics and behavior (TCB)	.215	.044	.366	.047	4.1390	.000

\*, \*\* - dependent variable(s) (Source; Survey data, 2016/2017)

**5.0 Discussion and Conclusion**

This study has made effort to determine the relationships between programme quality and students' satisfaction and their impact on the students' word of mouth towards Biosystems Technology programme. Beside to that, this study has paid attention to ascertain; Is students' satisfaction mediating the relationship between programme quality and word-of-mouth?

In fact, the findings of (H1) confirmed that out of six dimensions, programme quality in SCM, SAEM, CECS and SFLR were the significant predictor of students' satisfaction with Biosystems Technology ( $\beta=0.252, 0.287, 0.122 \text{ \& } 0.110, P<0.01, P<0.05$ ). Indeed, with increasing the quality in SCM, SAEM, CECS and SFLR, the students' satisfaction would be increased. Further, the students studied Biosystems Technology have perceived above dimensions as more important quality parameters where students' enrolment into the programme is considered, similarly, the findings confirmed that programme quality in methods of assessment and evaluation and also teachers' characteristics and behavior were not statistically significant with the students' satisfaction. Further, it has given the important point for the relevant authorities that these two dimensions were not the significant predictors of students' satisfaction.

On the other words, with increasing the programme quality in teachers' characteristics and behavior and also methods of assessment and evaluation, the students' satisfaction not positively and significantly increased. Thus, this finding are consistent with the past studies of Peng and Samah, 2006; Sinclaire, 2010; Tessema *et al.*, 2012; Zakaria *et al.*, 2016). However, this finding contradict with the previous studies of Grace *et al.*, 2012 and Sinclaire, 2010 though consistent with Zakaria *et al.*, 2016 and Grace *et al.*, 2012. The finding of (H2) statistically confirmed that students' satisfaction with Biosystems Technology programme is positively, significantly related with the students' word of mouth behavior. The significant and positive impact explain that uplifting students' satisfaction with programme, increasing students word of mouth in positive way because satisfied students more likely tend to spread positive word of mouth (Leonnard, 2017). On the other words, higher the students' satisfaction, higher the students' word of mouth towards Biosystems Technology programme. In fact, the relevant & authorities should aware that students' satisfaction with Biosystems Technology can be used to predict students' word of mouth towards the programme of study. In the sense of beta coefficient (Table 4.3) suggests that ( $\beta=.415$ ), with increasing students'

satisfaction, the students' intention to spread positive word of mouth significantly increased. In fact, this finding was in line with the past studies of Soderlurd, 1998; Alves and Rapaso, 2007; Luis *et al.*, 2008; Serenko, 2010; Ryu *et al.*, 2011; Teerawut, 2011).

Besides to that, the finding of (H3) clearly emphasized that only subject content in major (SCM) dimension of programme quality was the significant predictor of students' word of mouth. On the other words, other dimensions of programme quality except SCM were not significant predictors of students' word of mouth. Furthermore, students who studied Biosystems Technology have confirmed that SEAM, CECS, TCB, MAE and SFLR were not much important quality aspects where students' positive word of mouth towards programme of study is considered. In the sense of such insignificance, it indicates that relevant authorities do not need pay much attention about aforesaid quality dimensions when ensuring the programme quality as expected by the students. Moreover, the results of H4 indicated that students' satisfaction plays a full intervening role between P.Q. in TCB abs SWM. Similarly, it was found that the relationship between P.Q. in SFLR and SWM fully mediated by students' satisfaction. In brief, these findings were in line with Naik *et al.*, 2010; Jiewanto, 2011; Teerawut, 2011; Mansori, 2014.

### 5.1 Conclusion

In short, this study made attempt to investigate the relationships amongst the programme quality, students' satisfaction, students' word of mouth behavior where it has focused to find the answer for; Is there any relationship amongst the programme quality, students' satisfaction and students' word of mouth towards Biosystems Technology programme as perceived by the students at senior secondary stage (Advanced Level) of education in Sri Lanka?

In fact, the findings clearly confirmed that the how were the dimensions of programme quality related with the students' satisfaction. In brief, four dimensions (SCM, SEAM, CECS & SFL) of programme quality except TCB and MAE were significant predictors in changing students' satisfaction in positive way whilst students' satisfaction was found to be a significant and positive predictor of students' of mouth. But, only P.Q. in SCM has direct, significant impact on students' word of mouth towards Biosystems Technology programme. In fact, it has found that other dimensions of P.Q. cannot directly use for changing students' word of mouth. It means that such dimensions of programme quality must go through indirect path (e.g. via students' satisfaction) in order to intent to spread positive word of mouth. In this case, it has evident that P.Q. in TCB and SFLR were positively influence the students' word of mouth through students' satisfaction. In sum, the findings of this study provide an opportunity for the policy makers and relevant other personnel in order to eliminate the quality issues of programmes offered where the higher number of students' enrolment is considered.

### 5.2 Theoretical and practical implications of the study

In reality, scant or limited literature was the literature gap of this study. In fact, this study provides better contribution into the body of knowledge as establishing a validated measurement instrument and also contributing that there are significant relationships exist amongst the constructs of interest. Moreover, it was unable to find any studies with all these constructs together as one model. Hence, the conceptual model which statistically established in this study provide a better platform for the researchers who wish to do a research in different area and context except the contribution made to knowledge bank. Though a number of strategies have been applied for popularizing the Biosystems Technology programme,

students' enrolment was not at satisfactory level which was the main issue behind this study. In fact, the findings of this study encourage the policy makers, curriculum developer and relevant other personnel to re-visit, re-think and re-decide what should do? where quality of programme is considered.

### 5.3 Limitations and Future studies

In the sense of limitations, this study has several limitations which make a better environment for further studies. Firstly, as this study consisted of 325 students from central province in Sri Lanka, the findings could not be generalized to all the secondary students studied Biosystems Technology, not only that even to other provinces of the country. Therefore, this study should be extended to other provinces with larger sample. In fact, future studies may include longitudinal study for same issue since this study was limited to a cross sectional study.

Otherwise, a qualitative study suggested to ascertain the relationship amongst the constructs of interests since some relationships might not be captured in a quantitative study. Furthermore, the scholars would stimulate to modify the conceptual framework by adding relevant moderating factors which could uplift the association amongst the constructs of interest.

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