

Training Modes of Traffic Engineering Professionals under the Perspective of Student Satisfaction with Educational Service Quality

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Abstract

With reference to existing research results home and abroad, as well as empirical results in other industries, the connotation and specific observing scopes of variables are defined, such as the students' expected educational service quality, students' perception, perceived value and student satisfaction. The Model of student satisfaction with educational service quality is designed by using Structure Equation Modeling (SEM). Followed by taking traffic engineering students from six universities in Taiwan and eight universities in mainland China as study samples, relationship between student satisfaction of educational service quality in traffic engineering and its influence factors, differences between training modes in Taiwan and mainland in traffic engineering is demonstrated and analyzed. Finally, suggestion on reform directions of traffic engineering professionals in mainland are proposed, from aspects of basic theoretical curriculum to training specifications etc.

Key words: STRUCTURAL EQUATION MODEL, TRAFFIC ENGINEERING, EDUCATIONAL SERVICE QUALITY, STUDENT SATISFACTION, TALENT TRAINING MODE

1. Introduction

College education service quality refers to the use of teaching resources in universities to provide portfolio of products, including the

intrinsic characteristics of tangible products and intangible services meeting the demands of education subject requirements or potential, it mainly depends on the buyer's perception to the

service level of university education in the service contact on "real moment". Among them, the tangible products cover environmental elements, which provide services supporting facilities and equipment, as well as the service object to buy used items; Intangible service covers students achieve dominant elements such as human capital value-added, and the improvement of college academic atmosphere, the quantitative recessive element such as social environment. As the main direct consumption of college education service combination product, college students' value judgment on the result of the higher education service process and goal realization degree has become an important link to the process of management innovation. Thus, in this paper, by using the method of structural equation modeling (SEM), student satisfaction model for the education quality in colleges and universities is designed. Taking traffic engineering students from six universities in Taiwan and eight universities in mainland as study sample, the differences between traffic engineering professionals training modes in Taiwan and mainland are analyzed, to provide a theoretical foundation for traffic engineering professional talent training mode reformation in mainland.

2. Research hypothesis and modeling for student satisfaction on education quality

2.1. Initial model and research hypothesis setting

Student satisfaction on service quality of higher education refers to the students' subjective judgment of education quality in colleges and universities. It depends on the students' expectations of service quality education and the

actual perception of difference degree [1]. In this paper, with reference to American customer satisfaction index (ACSI) model [2], an improving designed student satisfaction model for educational quality is used to analysis the relationship between the education service quality of student satisfaction and its influence factors. In this model, education service expected quality, perceived quality, perceived value are latent variables, student satisfaction, students complain, students loyalty are result latent variables, the study hypothesis are put forward as the following:

H1: Students' education service expectation quality positively affects the students' satisfaction degree.

H2: Students' education service perception quality positively affects the students' satisfaction degree.

H3: Students' education service perception quality positively affects the students' perception value.

H4: Students' education service expectation quality positively affects the students' perception value.

H5: Students' perception quality positively affects the students' satisfaction degree.

H6: Students' perception value take the mediate role between students' education service expectation quality and students' satisfaction degree.

H7: Students' perception value take the mediate role between students' education service perception quality and students' satisfaction degree.

The specific design of the initial model M₀ is shown in figure 1.

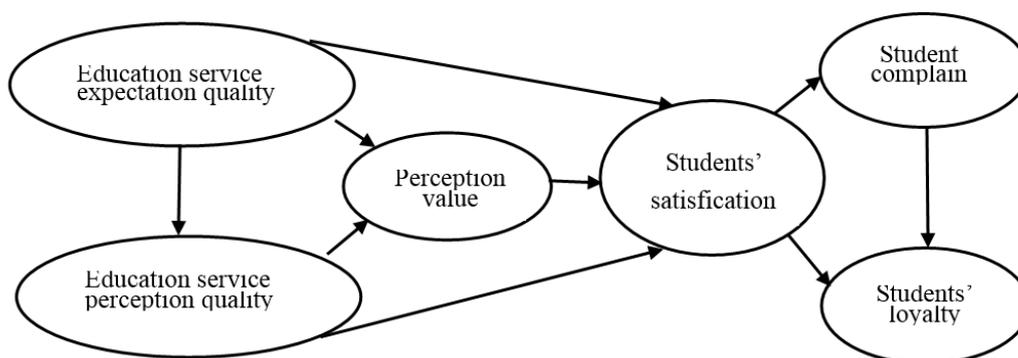


Figure 1. Initial Model M₀ of students' satisfaction degree for college education service

2.2. Specific scope of latent variables in the model and data collection

Specific scope of student education service expectation and perception quality and data collection

Students education service expectation quality refers to education service expectations

level before receive the education service. Related to the education service expectation quality, education perception quality refers to the college students' actual feelings after they received the education service. In this paper, by referring to standard table of SERVQUAL [3] and maturity table developed by He Li [4], higher education

Engineer pedagogics

service quality evaluation scale table is designed according to the five levels of logical structure, such as guarantee, responsiveness, reliability, empathy, and tangibility. The table contains 16 observable variables, to evaluate the education service quality expectation and perception level of students from Taiwan and mainland. Details are shown in table 1, 1 to 2 columns.

(1) Confirm observation variable weight by the only reference comparison judgment method (G2-method)

In this paper, according to the principle of combining management experts and academic experts, observation variable weight is obtained by a survey of 10 rich management experienced experts in colleges and universities for. Firstly, expert S_i picks out the most unimportant variable

he thought, which present by X_{jm} , from the observation variable set $\{X_j\}$. Remark the obtained variable set $\{X_{j1}, X_{j2}, \dots, X_{jk}, \dots, X_{jm}\}$. Secondly, according the assignment reference table r_{km} [5], as shown in table 2, give the rational judgment for the important degree ratio between variable X_{jk} and X_{jm} , which represented like this: $r_{km} = A_k (k = m-1, \dots, 3, 2, 1; A_k > 0; A_m = 1)$. Finally, confirm the variable weight coefficient W_{jk} , which represented as $(k = 1, 2, \dots, m)$. After arithmetic average the rational assignment given by experts S_i , the component weights vector W and observation variable weight vector ω can be achieved. Details are shown in column 1 and 3 to 6 in table2.

Table 1. College education quality evaluation components analysis based on the perspective of students

Components (weight)	Observational variable	Weight of observational variable			
		S_1	S_i	S_{10}	Final weights
Guarantee (0.218)	During studying, professional direction different obviously, and students can obtain the rich professional knowledge and skills combine with their interests	0.254	...	0.199	0.042
	Teachers have strong sense of responsibility, diversification and individuation teaching way	0.212	...	0.238	0.044
	Reasonable arrangement of teaching school activities, including providing enrichment and practical courses, learning materials, practice base, social practice and so on	0.212	...	0.199	0.044
	Teachers have sufficient knowledge and ability to solve student's confusion	0.146	...	0.165	0.040
	School library information is complete, the digital resource is rich, well-equipped teaching facilities	0.176	...	0.199	0.048
Responsiveness (0.216)	School can understand students' learning needs	0.197	...	0.260	0.052
	School has a service or willingness to help students	0.283	...	0.220	0.052
	School try to achieve the fundamental interests of the students	0.237	...	0.260	0.054
	School can timely pay attention to students' thought, and respond quickly to the reasonable requirements of students	0.283	...	0.260	0.057
Reliability (0.204)	School can give priority to students, and take humanized management	0.236	...	0.250	0.049
	The teaching management system is perfect, and fairly implemented, can provide complete information of teaching	0.197	...	0.250	0.053
	School has perfect teaching quality supervision system, and can collect the feedback from teachers and students	0.283	...	0.250	0.048

	Life is safe and reliable during studying here	0.283	...	0.250	0.054
Empathy (0.197)	The teachers often communicate with students, harmonious relationship with students	0.545	...	0.5	0.104
	Schools can provide students with necessary study consulting services	0.455	...	0.5	0.094
Tangibility (0.165)	School has a beautiful campus, and has convenient logistics service facilities (accommodation, medical, canteen, etc.)	1	...	1	0.165

Table 2. r_{km} assignment reference table

r_k	Definition
1.0	In relative to the target Y, index X_{jk} and X_{jm} are equally important
1.2	In relative to the target Y, index X_{jk} is slightly more important than index X_{jm}
1.4	In relative to the target Y, index X_{jk} is obviously more important than index X_{jm}
1.6	In relative to the target Y, index X_{jk} is much more important than index X_{jm}
1.8	In relative to the target Y, index X_{jk} is extremely more important than index X_{jm}

(2) FAHP for students' education service quality expectation and perception

Survey of the 100 traffic engineering students track samples from fourteen universities, they are National Cheng Kung University, Daojiang University, Feng Chia University, Kainan University, National Taiwan University, Chung Hua University from Taiwan and Southeast University, Beijing University of Technology, Tongji University, Chang'an University, Wuhan University of Technology, Wuhan University of Science and Technology, South China University of Technology, Minjiang University from mainland. In this survey, 1400 questionnaire are sent out and 1231 effective questionnaire are retrieved. The questionnaire content include two parts, education service quality expectation and perception assessment. Education service quality expectation is set up according to the observable variables set $x_j = (x_1, x_2, \dots, x_{16})$ in table 1. Quality expectation assessment is set up according to component variables set $y_j = (y_1, y_2, \dots, y_5)$ in table 1. Combining with the liker4 verbal rating scales, quantity receive the subjective assessment of students.

In consideration of the observation variables effects on students' education service quality expectation and perception evaluation, as well as reserve the whole information of single factor evaluation, in this paper, the weighted average operator is used to fuzzy comprehensive evaluation step by step upstairs, that is $M(\bullet, \oplus)$

operator. “ \bullet ” is common real number multiplication, $\alpha \oplus \beta = \min(1, \alpha + \beta)$, $\oplus \sum_{i=1}^m$ is summation for m numbers under \oplus operation, that is $b_j = \min\left[1, \sum_{i=1}^m a_i r_{ij}\right]$. Finally, by combining the component weight vector W and observation variable weight vector ω , the fuzzy comprehensive evaluation value V_m and v_m , aimed at target layer and component layer, is given by students from Taiwan and mainland. The fuzzy comprehensive evaluation value for component layer covered by the service quality expectation, service quality perception is defined respectively as $x_i (i = 1, 2, 3, 4, 5)$, $x_j (j = 6, \dots, 10)$. Detailed computational process is shown in formula (1).

$$V_m = W \oplus \omega \oplus G_m = \begin{bmatrix} w_1 \\ w_2 \\ \dots \\ w_5 \end{bmatrix}^T \oplus \begin{bmatrix} \omega_1 \\ \omega_2 \\ \dots \\ \omega_5 \end{bmatrix}^T \oplus \begin{bmatrix} g_1 \\ g_2 \\ \dots \\ g_n \\ \dots \\ g_{28} \end{bmatrix} \quad (1)$$

(B) Perceived value and the specific categories of latent variables and data collection

In reference to foreign existing research results and other industries empirical results, perceived value and specific categories of the connotation and observation of the latent variables in initial model are proposed. And similarly measured by liker4 verbal rating scales method. As shown in table 3.

Engineer pedagogics

Table 3 . Perceived value and the connotation of latent variables and observation variables in model

Latent variable	Connotation	Observation variables
Perceived value	Anderson, E. W. [6] think that, for customs, value can be measured by disparity between the expectation of service quality and actual perception	X11 : Compared with other colleges, how much you think that your school of transportation engineering professional education services improve your comprehensive quality X12 : The comprehensive evaluation value gap between expected quality and perception quality
Students' satisfaction degree	Oliver,R.L. [7] think that, the customs' satisfaction level is directly affected by expectation and the degree that customs have been satisfied.	X13 : What degree that you satisfied with your school of transportation engineering professional education services X14 : Compared you're your expectation, How much do you satisfied with your school education service
Students' loyalty	Huang J. P. [8] think that, as the combination of the customer awareness and behavior, on the basis of satisfaction,customer's long-term purchase commitment for a certain brand or enterprise, can be measured by custom's recommend intention and repeat purchase intention.	X15 : Will recommend to friends or enter the traffic engineering profession X16 : When encounter problems related to the education services, can feedback to college with understanding, and offer for the solution.
Students' complain	Anderson, E. W. [9] think that, customer satisfaction will reduce customer complaints. And customs express their complaints by formal complaints, informal complaints, or influence others custom's choice.	X17 : The frequency you complain for your university education service X18 : What about the handling results of students' complaint

3. Differences analysis on empirical results of double model intermediary effect

3.1 Reliability analysis of double model

Confirmatory factor analysis showed that, the R2 of the observable variables are greater than 0.5, the reliability of the single observable variables is high. Cronbach's Alpha coefficient test results show that, the two questionnaires "students complain" of Cronbach's Alpha coefficient are 0.352 and 0.245, other subscales of Cronbach's Alpha coefficients are greater than 0.8, and the total table of Cronbach's Alpha coefficient is 0.905. The scale's reliability is high overall, so the "students complain" latent variables are deleted in initial model M0 path map, to achieve modified model M1 and M2.

3.2. Evaluation and Modification of the model

In this paper, AMOS7.0 modeling tools are used to evaluate and modify the model M1 and M2. Significance test results of parameters are shown in table4, the two latent variables "education services expected quality" and "education service quality perception" in model M1, M2 for the standardization of "student satisfaction" latent variable path coefficients are 0.005, -0.039,-0.012, -0.005, it's parameters significant test statistics C.R. values respectively are 0.056, -0.511, -0.006, -0.007, the corresponding P value is greater than 0.05, then judgment this path coefficient under the confidence level of 95% shows no significant differences with zero, accept the assumption that the original path coefficient is zero, so this two paths need to be deleted to further simplified model M1and M2, and get the modified model M1* and M2*, as shown in figure 2.

Table 4. Parameter significance test results for simplified and modified model

rch hvdof	Standardized path coefficient estimation	C.R.	P	Results
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	M ₁	M ₁ [*]	M ₂	M ₂ [*]	M ₁	M ₁ [*]	M ₂	M ₂ [*]	M ₁	M ₁ [*]	M ₂	M ₂ [*]	
	Initial	Modified											
H ₁	.005	-	.012	-	.056	-	-0.06	-	.942	-	.944	-	False
H ₂	-.039	-	-.005	-	-.511	-	-0.07	-	.565	-	.925	-	False
H ₃	.303	.309	.172	.167	3.138	3.256	1.514	1.523	***	***	***	**	True
H ₄	.256	.240	.982	.975	2.443	2.424	7.322	7.254	***	***	***	**	True
H ₅	.910	.905	.754	.753	6.352	7.002	10.232	12.35	***	***	***	**	True
H ₆	.233	.217	.740	.734	-	-	-	-	***	***	***	**	True
H ₇	.270	.280	.130	.126	-	-	-	-	***	***	***	**	True

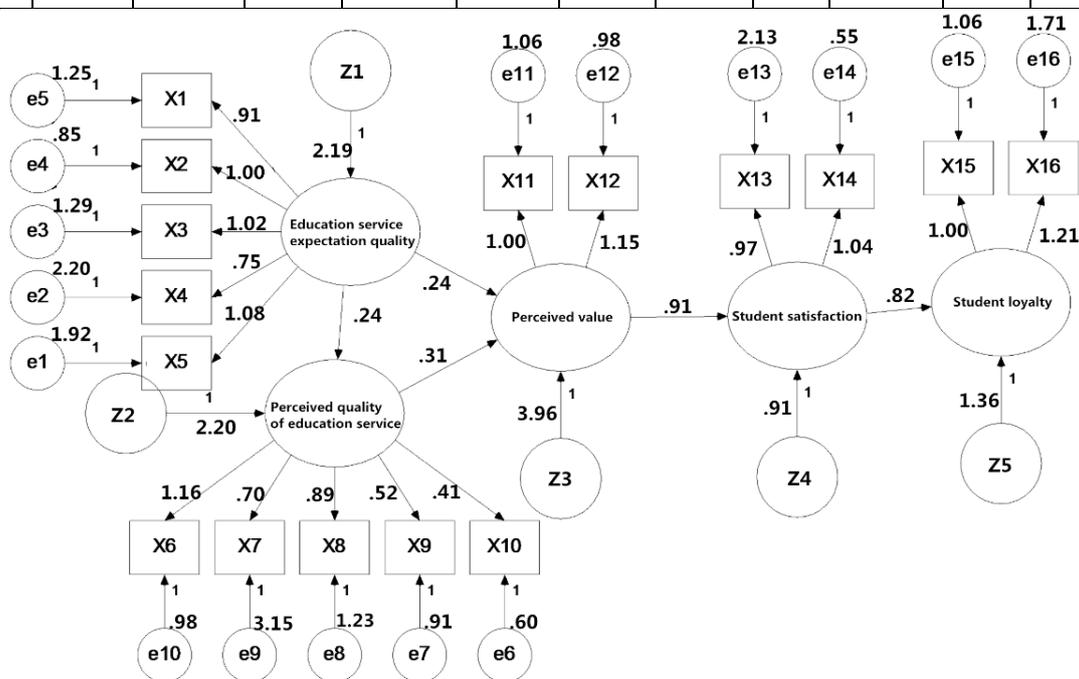


Figure 2. Parameters evaluation and test result for superior model M₁^{*}(colleges in mainland)

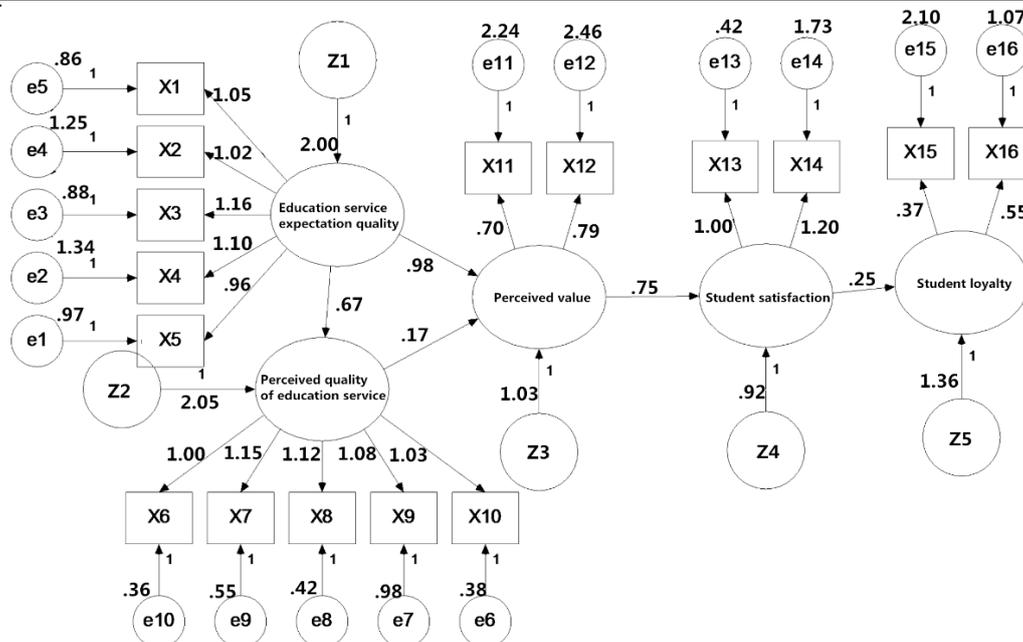


Figure 3. Parameters evaluation and test result for superior model M_2^* (colleges in Taiwan)

Table 5. Fitting index table for modified model M_1^* , M_2^*

The goodness of fit index and evaluation standard Model	CMIN/DF (χ^2/df) (The smaller the better)		RMSEA (<0.08)		NNFI(TLI) (>0.9)		CFI (>0.9)	
	M_1^*	M_2^*	M_1^*	M_2^*	M_1^*	M_2^*	M_1^*	M_2^*
Default model	2.385	1.235	0.073	0.051	0.948	0.951	0.975	0.972
Saturated model	-	-	-	-	-	-	1.000	1.000
Independence model	10.127	6.247	0.214	0.198	0.000	0.000	0.000	0.000

The overall fitting degree evaluate for modified model M_1^* and M_2^* . Absolute fitting index, including χ^2 and RMSEA, relative fitting index, including non-standard fitting index NNFI (TLI), comparative fit index (CFI) is usually used to evaluate the overall fitting degree of a model. As shown in table 5, fitting index is in acceptable range, fitting degree is good, and the modified model M_1^* , M_2^* is superior models.

3.3. Differences analysis on the empirical result of indirect effect

Seen from the variables standardized path coefficient of superior model M_1^* , M_2^* , in Taiwan and mainland, student's satisfaction for traffic engineering specialized education service quality relationship between influencing factors and strength of mutual effect. In which, the indirect effect refers to causal variables indirectly influence the results through affecting one or more intermediary variables. When there is only one mediating variable, the size of the indirect

effect equals to the product of two path coefficient. The superior model shows that, it is very different between the indirect effects of the five components of traffic engineering student's satisfaction for education service perception quality in mainland. Assurance, responsiveness, reliability, empathy and tangibles by the perceived value of the indirect effect of student satisfaction are 0.327, 0.197, 0.251, 0.147 and 0.116. This shows that, among the various quality perception components of affecting students' satisfaction degree, the indirect effect of guarantee is strongest, and the tangibility is the weakest. And for colleges in Taiwan, the indirect effects by the perceived value of the indirect effect of student satisfaction are 0.128, 0.147, 0.143, 0.138, 0.131, representation of each factor is more balanced. Therefore, for the managers of colleges in mainland, the positive reform of teaching quality, if deepen the reform of the curriculum, practice teaching activity, teaching resources level etc. ,

the indirect effect of promoting the student satisfaction on education service is the largest, and the effect is inconspicuous when only improve the hardware level of logistics service facilities.

From the point of observation variables, discrete coefficient is used to measure the degree of discrete components student assessment in this paper. The calculating formula is $CV_j = \sigma_j / \bar{Y}_j$, where σ_j is the standard deviation of component indexes X_j , \bar{Y}_j represent the average value of X_j , the larger CV_j , the bigger the difference degree of evaluation variables. Survey results indicate that the mainland universities traffic engineering students observation variables mean satisfaction evaluation direct at "guarantee" is lower compared with other components and colleges in Taiwan, reflects the difference in transportation discipline teaching quality of student satisfaction between Taiwan and mainland in a certain extent, there is obvious distinction in field of discipline orientation and discipline research. At the same time, compare students from different colleges in view of the components satisfaction evaluation average value of discrete coefficient, the value in mainland is lower than Taiwan, reflect that in personnel training mode of transport subject, each university in Taiwan has its own characteristics, but the difference of training mode in mainland universities is not obvious. The differences of geographical environment, economic development disparity and discipline development history are the main reason for the gap between Taiwan and mainland.

Narrow territory, advanced manufacturing industry and foreign trade services, well-constructed transport infrastructure, rapidly development of ocean shipping and air transport, all these factors in Taiwan contribute to the flexibility and diversity-development of traffic engineering professional talent training. Compared with Taiwan Island, traffic engineering in mainland has a relatively short history. In mainland China, urban congestion problem increasingly prominent, professionals on traffic management and control, intelligent transportation professionals are desiderated, these factors caused the obvious differences on traffic engineering discipline orientation and discipline research. In Taiwan Island, traffic engineering major is characterized as management and service discipline, and the professionals training direction focus on transportation and logistics management, professional fields related to ocean shipping, air transport and road transport. However, in mainland China, the traffic engineering major is

characterized as engineering discipline, the professionals training is aimed at solving engineering problems in road infrastructure construction and urban traffic control. In Taiwan, professional talent cultivation system of majors similar to traffic engineering is oriented to several aspects such as air transport, ocean transportation, rail transport and road transport. But in mainland, it is mainly oriented to road traffic engineering.

The difference of the subject orientation and research field causes the distinction on traffic engineering curriculum system in Taiwan and mainland. There is no majors named as "traffic engineering", but have the relevant majors such as "transportation system management" and "transportation technology and management". Contrast the professional course systems of majors similar to traffic engineering at universities in Taiwan, it can be found that the professional direction is different apparently. Among them, take road transportation as main research direction is National Cheng Kung University, Daojiang University, Feng Chia University, Kainan University, National Taiwan University and Chung Hua University. Training direction of traffic department in National Cheng Kung University is urban traffic management and control, transportation planning and management, the basic theory curriculums account for a large proportion. Training direction of traffic department in Daojiang University is transportation and logistics services, is featured by characteristics of the service discipline, these is no theoretical foundation curriculums, all curriculums are related to professional skills. Transportation technology and management department in Feng Chia University shows the professional characteristics of road traffic safety, in addition to the basic theory curriculums, professional curriculums is aimed at traffic safety analysis. The research field in transportation technology and management department in Kainan University directed to all aspects of road transportation system. Department of civil engineering in National Taiwan university is characterized as road engineering, mainly cultivated professionals on road planning and design. Department of transportation technology and logistics management in Chung Hua University take the intelligent transportation system and logistics management as the main domain, students can choose their flexible training direction of interest by choosing different professional elective course.

Many universities in mainland China set up traffic engineering major, and most of them are oriented to road transportation domain. The

Engineer pedagogics

curriculums pay much attention to the basic theoretical system. Mathematical and computer curriculums are arranged in an important position. Professional basic theory curriculums contain traffic engineering, traffic flow theory, operational research in every university, so it can be infer that the three courses are widely recognized as basic theoretical course for traffic engineering major. The professional curriculum is wide coverage, including traffic planning, traffic management and control, road engineering, intelligent transportation and other fields. Curriculum design is main way to cultivate the traffic engineering students' manipulative ability in mainland. With the coming era of big data, and the popularization of Internet of things and Intelligent Transportation System, university enrollment scale in mainland increase rapidly. Problems such as shortage of high-level teacher, structural differences of discipline and regional, low level of curriculum sharing between departments and schools, hollowing out of teaching practical and application characteristic, inconsistency of teaching contents and students interested, despise software construction and students' participate tendency, have been increasingly emerging. These problems limit the upgrade of teaching quality in mainland in some degree, and the teaching quality is difficult to comply with the demand of social changes, need further reform.

3.4. Empirical result generality analyses of intermediate effect

From the perspective of the correct path of the model, the path that students' expectations quality and perceived quality directly affect the student satisfaction is not clear in model M2 and M2*, it works by students' perceived value of student satisfaction. Perceived value plays the intermediary role between education service life expected quality and student satisfaction. Intermediary effect of superior model M2 is $0.24*0.91+0.24*0.31*0.91=0.286$, intermediary effect of superior model M2* is $0.98*0.75+0.67*0.17*0.75=0.820$. In consequence, raising the perception value of reflect students perceived quality and the expected quality gap, is an important way to improve the student satisfaction and influence students' behavioral intention.

4. Conclusions

In this paper, main conclusions are as follows: (1) for colleges in Taiwan, the indirect effects by the perceived value of the indirect effect of student satisfaction are more balanced relative to the mainland universities. Therefore, for the managers of colleges in mainland, the positive reform of teaching quality, if deepen the reform of

the curriculum, practice teaching activity, teaching resources level etc. , the indirect effect of promoting the student satisfaction on education service is the largest. (2)The difference in transportation discipline teaching quality of student satisfaction between Taiwan and mainland is obvious. (3)In personnel training mode of transport subject, each university in Taiwan has its own characteristics, but the difference of training mode in mainland universities is not obvious. The differences of geographical environment, economic development disparity and discipline development history are the main reason for the gap between Taiwan and mainland. (4)Perceived value plays the intermediary role between education service life expected quality and student satisfaction. For mainland and Taiwan, Raising the perception value of reflect students perceived quality and the expected quality gap, is an important way to improve the student satisfaction and influence students' behavioral intention.

Based on the above conclusion, the decision of reform orientation on mainland traffic engineering professional talent training mode should be setted from these two aspects:

4.1. Actively promote the reform of the teaching quality; comply with the demand of social changes

(A) *Differential treatment in education and refine the development direction*

Mainland universities can adopt the training mode of thick foundation and divided direction; make full use the advantage theory curriculum resources. On the basis of increasing basic theory curriculum in the field of new traffic engineering, such as the communication technology and computer technology, control technology, wireless sensor network involved in intelligent transportation field. Along with the specialized direction, i.e. add different direction of elective courses, students according to their aptitude for different professional direction, make students form in a certain technology expertise. Improve students' professional knowledge's depth; at the same time achieve the purpose of enhancing employment competitive advantage and training traffic engineering applied professionals.

(B) *The practice teaching, strengthen students' practical ability*

Mainland universities should vigorously develop the characteristics of vocational education and technical training, local technical curriculum system and teaching content. Increase the proportion of applied knowledge courses and practice teaching, to cultivate both record of formal schooling education basic quality and professional technology application ability of

applied professionals, such as in computer software programming teaching. With programming examples in teaching, assess student learning outcomes in the form of program design and show.

(C)Integrate resources and realize the complementary of internal and external advantages

Mainland universities should strengthen the practice teaching as the breakthrough point, to improve the teachers and the funds investment of practicing education curriculum. In the case of resource gaps cannot be solved quickly, integration and optimization of curriculum resources, teaching facilities, sharing of laboratory equipment is an ideal path.

Strengthen the share of teachers and teaching facilities. Through scientific research content positively transform to the teaching content, scientific research achievements timely transform to teaching achievement, the penetration of research methods and teaching methods, the bidirectional extension of teaching and scientific research problems, promote the development of scientific research team and teaching team. For the teachers' overall quantity and the quality of teachers, could actively introduce the government, the enterprise staff as a part-time teacher, supplementary teacher quantity; at the same time solve the problem of shortage of teachers' practical experience. In the matter of the sharing of teaching facilities, in addition to resources sharing between departments within the scope of the colleges, the use of industry facilities should be strengthened, more productive, depth of cooperation should be done. For colleges and universities, should make full use of network and regional advantages; realize the traffic engineering's advantages direction curriculum resources sharing.

(D)Cohesion features, close to the talent market demand

For setting up traffic engineering colleges and universities, it is important to actively contact industry organization and local government, social intermediary. Update related information of the social demand for traffic engineering; gradually improve the management information system of college graduates supply and social demands. And timely reflect the social demand forecast to the personnel training mode, make the construction of disciplines is in line with local market and industry demand, further enhance the market competitiveness of the training, gradually improve the social public recognition.

4.2 Establish the quality of education service in colleges and universities; improve the students' professional education service quality value perception

Mainland universities should set up "student satisfaction" as the guidance of education service quality [10]. Gradually improve benign circulation mechanism of students highly involved in the education service quality evaluation; build colleges and universities with high levels of social recognition and participated. First of all, mainland universities should be widely launch a recruit students employment related functional departments and professional teachers and students. With the aid of all kinds of new media to carry out various forms of positive image propaganda activities, in order to promote students good expected effect on the general education service of the transportation engineering professional before the examination. At the same time, the accurate positioning their own development objectives, fully understand the various types of professional education of college students on the basis of analyzing the information demand, combined with its actual development level, make sure to provide education service content, and focus on intangible service elements design field. Second, the abstract intangible elements into demonstration of environment and items of tangible; to gradually improve students experience of the real education service quality perception level. Again, on the basis of full service product design, combined with the educational service quality specifications, such as professional education idea transformation, business process optimization, etc., to ensure the smooth operation of the delivery systems hardware and software design process. And in education service delivery process, for students open the "voice" of communication channels, knows that it is the result of the service and the service delivery process; efforts to reduce services provide service gap between the promise and reality. Finally, it is important to analysis of the gap between students' actual perception of service performance and the desired level of service. Ensure the actual perception but not more deviating from the expected, at the same time; shrink gap the actual perception and expectation or need, namely the perceived value to improve the education service in colleges and universities student satisfaction.

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Engineer pedagogics

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References

1. Parasuraman, A., Zeithaml, V. A., Berry, L. L. (1985) A Conceptual Model of Service Quality and Its Implications for Future Research. *Journal of Marketing*, 49(4), p.p.41-50.
2. Bruhn, M., Grund, M. A. (2000) Theory, Development and Implementation of National Customer Satisfaction Indices: the Swiss Index of Customer Satisfaction. *Total Quality Management*, (7), p.p.1017-1028.
3. Zeithaml, V. A., Parasuraman, A., Berry, L. L. (1998) Delivering Quality Service: Balancing Customer Perceptions and Expectations. *Journal of Marketing*, 62(2), 123-125.
4. He Li (2012) Measurement of the Higher Education Service Quality: an Exploratory Study of SERVQUAL Scale. *Journal of Xi'an Jiaotong University (Social Sciences)*, 32(6), p.p.121-125.
5. Guo Yajun (2012) Comprehensive Evaluation Theory, Method and Extensions. Science Press: Beijing.
6. Anderson, E. W., Fornell, C. (2000) Foundations of the American Customer Satisfaction Index. *Total Quality Management*, 11(7), p.p.869-882.
7. Oliver, R.L. (1980) A Cognitive Model of the Antecedents and Consequences of Satisfaction Decisions. *Journal of Marketing Research*, 17(4), p.p.460-469.
8. Huang Jianping, Li Jinming (2003) Introduction to Customer's Satisfaction and Customer's Loyalty. *Journal of Beijing Technology and Business University (Social Science)*, 18(4), p.p.35-39.
9. Anderson, E. W., Fornell, C. (1994) Customer Satisfaction, Market Share and Profitability: Findings from Sweden. *Journal of Marketing*, 58(3), p.p.53-66.
10. Michael, R. K., Sower, V. E., Motwani, J. (1994) A Comprehensive Model for Implementing Total Quality Management in Higher Education. *Benchmarking: An International Journal*, 4(2), p.p. 104-120.

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