

Empirical evaluation of a forecasting model for successful facilitation on telematic learning programmes

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ABSTRACT

The Potchefstroom University for Christian Higher Education embarked on the telematic learning systems route in 1995, introducing an instructional model whereby students would benefit from having access to learning facilitators with both academic and field-related expertise in addition to educational technology applications. Facilitation is regarded to be an important component of the learning model, and hence, a forecasting model with the purpose to predict success in facilitation was developed during 2000. This article deals with the empirical evaluation of the forecasting model to ensure that managerial predictions are validated before it is implemented in practice. The forecasting model identified 8 key attributes for facilitation success based on performance measures from the 1999 Facilitator Customer Service Survey. During 2000 the annual Facilitator Customer Satisfaction Survey was employed to validate the findings of the forecasting model. A total of 1910 questionnaires were distributed in a mail survey to MBA telematic learning students of the PU for CHE. A total of 249 returned questionnaires suitably completed, were returned that resulted in a response rate of 13%. The objectives of the article are to:

- determine the validity of the forecasting model; and to
- test the model for practical managerial implementation.

The value of the research is practically significant. The empirical evaluation accredited the forecasting model partially whilst also highlighting its weaknesses. In addition, the evaluation also directed research into new horizons in the forecasting of facilitation success. The research concluded that:

- the forecasting model is successful concerning

the CSI value and a high positive linear correlation exists $r = 0,964$);

- the model could not be employed to forecast academic success as a function of facilitation;
- the questionnaire of 30 criteria (CSI measurement) could be reduced to only those identified by the forecasting model due to the high correlation between these two variable sets;
- the definition of success in facilitation is too conservative and should be extended towards other human behavioural characteristics; and
- academic success by facilitators not necessarily implies a high level of customer satisfaction.

The initial purpose of the research to enable the managerial approach to move from a retrospective to pro-active approach whereby corrective measures should be taken *before* not *during* courses or *after* the course, is partially successful because of its limited ability to predict facilitator success. Although already beneficial to the university as agent of quality education, the research should continue in a new direction, namely that of human behaviour to incorporate other influences than just the performance measurements of facilitators as academic expansion of the lecturer. Ultimately, the students deserve the best education possible to contribute to the maximisation of the country's human capital.

INTRODUCTION

The concept of distance learning has been a strategic issue for educators for decades and is currently growing in stature in the educational environment. Distance learning and technologies are expanding at an exponential rate because of the mere fact that the world of education and training are changing so rapidly. The number of non-traditional and off-campus students interested in post-secondary education continues to rise. As in most developing

countries vast inequalities in education exist in South Africa. The general features of training and education in South Africa could be summarised as follows (NEPI 1993):

- the great need for economic development to improve the quality of life of every person;
- increasing pressure on all resources especially financial resources for education;
- a high growth rate in the population with an increasing dependency ratio;
- a great need for improved infrastructure;
- great distances;
- lack of sufficient transport;
- lack of communication facilities;
- little access to libraries and information services in general;
- limited access to support among learners, educators and educational providers;

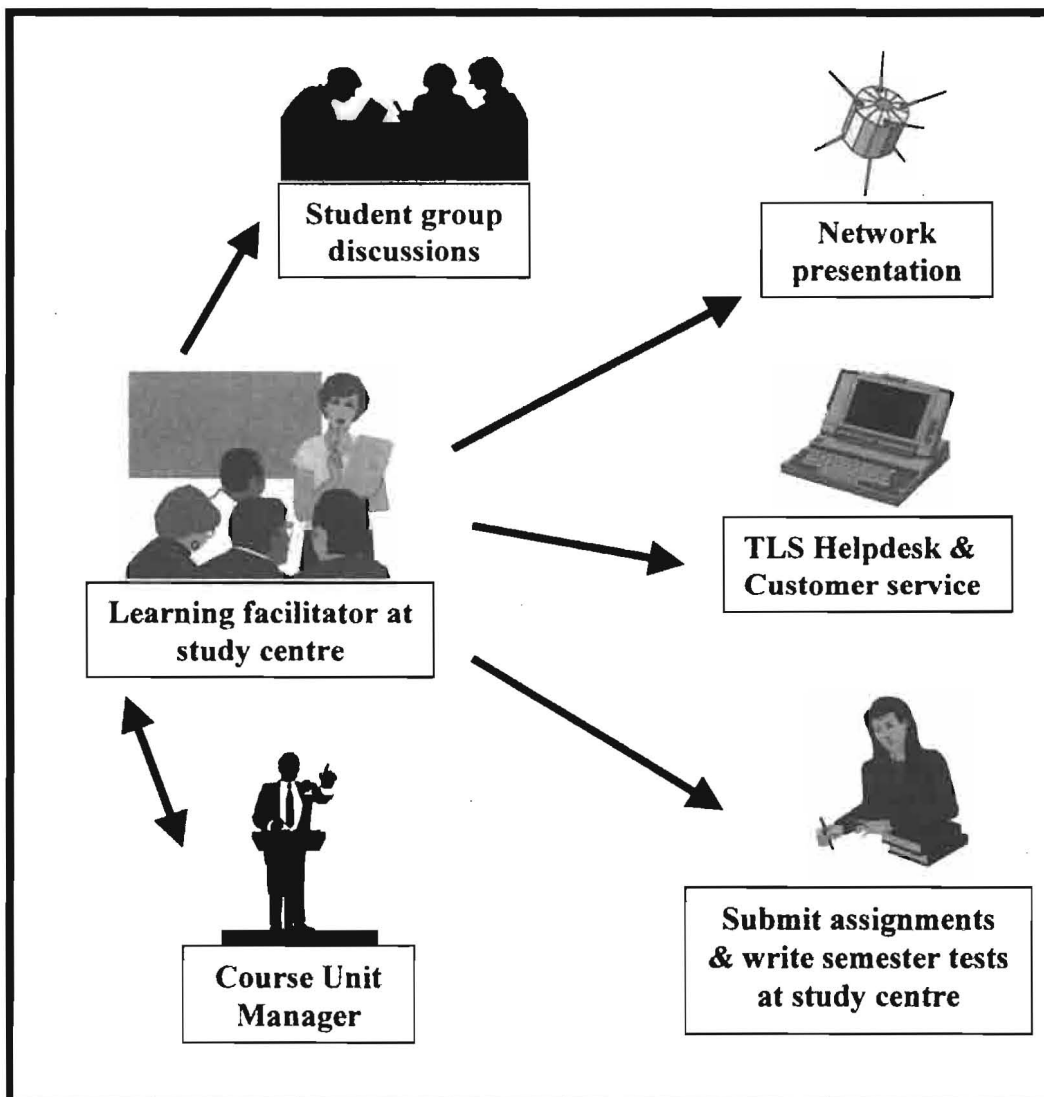
- "lack of a supportive environment for pedagogical and professional development";
- too little encouragement to invest in the transformation of the education process; and
- limited ability to enter into the learning environment. About 1,5 million adults had no education, 4,6 million have had education below seven years at school.

The current learning environment requires that the traditional way of teaching or education has become obsolete and has to undergo a dramatic change to a new dispensation of open learning in South Africa.

A great deal of resources is being spent on the facilitation network of the Potchefstroom University to ensure and preserve the renowned high quality learning of the university and its students. Therefore we should strive towards a type of "best code of practice" regarding the network of learning facilitators.

Figure 1

The Telematic Learning Model



FACILITATION

A facilitator, as defined by Zhaba (1998:1), is a person not necessarily an expert on the specific issue, but rather an expert in the process of communication, working with people, group dynamics, workshop design and implementation of teaching material. In summary: "a person that makes things work" in the educational environment. Imel (1997:2) further defines facilitation as the fostering, assisting and sharing of responsibility with learners, guiding the learning process through exercises, activities, discussions and group dynamics.

The PU for CHE employs a telematic learning model whereby learning facilitators play an important role in the delivery of quality education (See figure 1). Under guidance of the lecturer (from hereto referred to as the Course Unit Manager) facilitators perform a variety of educational functions, namely to:

- facilitate group discussions at remote study centres;
- guide students through the work;
- give practical inputs in accordance to academic material;
- evaluate and grade assignments (moderated by the Course Unit Manager); and
- supply limited administrative backup.

The core of successful facilitation, however, resides with the group discussions. At study centres students get the opportunity to participate in group sessions under the guidance of the course facilitator. The main function of the facilitator is to guide the students to solutions, to give specific applications of theory, and to act as the representative of the University. The University supplies specific academic guidance for these facilitators.

The duration of the group discussion sessions is an hour and a half per session and has a dual benefit:

- The facilitator is an expert in his/her applied field. The students benefit by the practical application of the theory that enables the students to apply the theory in their own work environment.
- The occupations of the students range over the whole spectrum of the society, eg from professional people like doctors, lawyers and parsons to the public and private sector. It is to be expected that with the different backgrounds students will perform to their experience accordingly (Bisschoff, Bisschoff & Van Wyk 1998). Evidently a student with experience in a production company will have an advantage in production management, while a student in the government sector, occupying an administrative position will be able to apply public administration principles more readily. The real benefit, according to Olivier (1998:40) for the

students lies in the exposure to such a variety of experiences and applications. Unlike students studying in isolation, the student in the group discussion session gets multiple influences from situations he is not familiar with (Bates 1999:208–211).

Although the facilitator is an extension of the Course Unit Manager, he need not be a teacher himself (Sherry 1996:12). His responsibilities are to motivate the remote site students and to keep up their enthusiasm towards distance learning. Other responsibilities include: the smooth running of the system and its equipment, helping students with interaction, handing out-collecting-grading papers, guiding collaborative groups and assisting the Course Unit Manager in the evaluation of the learning outcomes of students (Rowntree in Bisschoff, Bisschoff & Lotriet 2000:4).

RESEARCH OBJECTIVES, METHODOLOGY AND RESULTS

The objectives of the research on the validation of the forecasting model are to:

- determine the level of validity of the forecasting model; and to
- test the model for practical managerial implementation.

Since the research is a continuation of the research by Bisschoff, Bisschoff and Lotriet (2000:205–210) where a forecasting model was developed to predict the success of facilitators, the construction of the model itself is not discussed here. Readers interested in the detail of the model construction are referred to the article published in the *Journal of Education*, Volume 20, Number 3. Research methodology therefore refers only to the continuum research and thus the actual empirical evaluation of the proposed model.

The research population consisted of all MBA telematic learning students in 2000 at the PU for CHE who belongs to a study centre where the facilitation model of instruction is being followed. No sample was drawn and all the MBA students enrolled during the 2000 academic year received the questionnaire. A total of 1 910 questionnaires were distributed in a mail survey, resulting in a total of 249 returned questionnaires suitably completed. A response rate of 13% realised. The data pertaining to the post graduate degree programme, the Master in Business Administration, were used to perform the empirical evaluation of the forecasting model.

The refined 2000 questionnaire consisted of 30 criteria (reduced from 42 in 1999) that measured

the effectiveness of facilitators on the telematic learning programmes. The facilitators' performance was measured on a five-point Likert judgmental scale ranging from 1 (very poor/never) to 5 (very good/always). The data was employed to perform the empirical evaluation of a multiple regression model that resulted from the research that was conducted on the 1999 data. The research methodology is shown in figure 2.

In addition, a stratified random sample (stratified according to the different courses and academic years) identified 25 of the 84 facilitators in the MBA programme was drawn to evaluate the forecasting model. The sample thus consists of only post-graduate respondents in all three the year groups, representing respondents from all the MBA course units (Daniel & Terrell 1995:872).

The objective in the original forecasting model construction was to identify the vital attributes that facilitators in the telematic learning model should have and to determine the relative importance of each attribute that contributes to success of telematic learning facilitators. Table 1 shows the y-axis intercept (B_0), the 8 criteria and their respective coefficients of X (B_{1-8}) (signifying the slope of each criterion and its assessed contribution (Berenson & Levine 1999:869). The original model is shown in table 1.

Table 1
Intercept, criteria and values

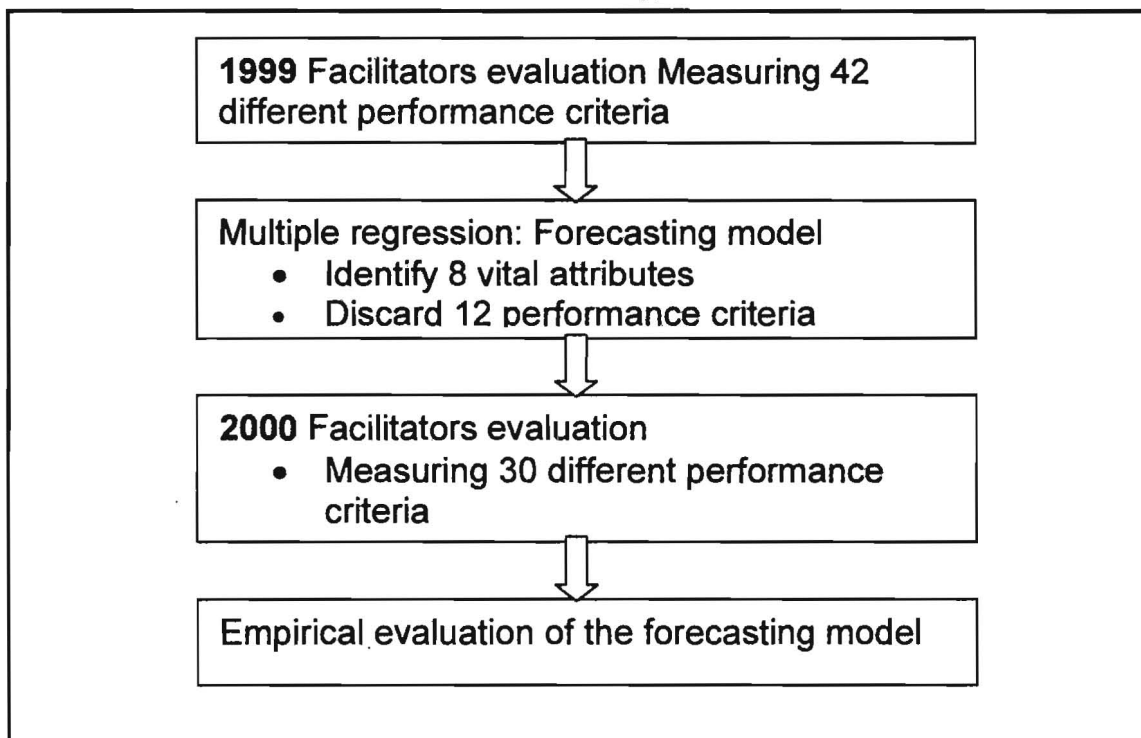
Criteria	B-value
X ₁ Guide students constructively	-8829
X ₂ Supportive more than what is expected by University	-0.04869
X ₃ Uses a variation in discussion techniques	-0.04250
X ₄ Positive attitude	-0.07201
X ₅ Attendance register kept	0.03928
X ₆ Raise points missed by groups during discussions	-0.04372
X ₇ Maintains discipline	0.04372
X ₈ Monitor progress of group discussions	-0.04279
Intercept Y-axis (B_0) = 2,19268 ($R^2 = 0.657$ and $p < 0.02$)	

Source: Bisschoff, Bisschoff and Lotriet (2000:207).

The forecasting model was thus formulated as:

$$Y = 2.19268 + [X_1(-0.08829) + X_2(0.04869) + X_3(-0.04250) + X_4(-0.07201) + X_5(0.03928) + X_6(-0.04091) + X_7(0.04372) + X_8(-0.042791)]$$

Figure 2
Research Methodology



It is important to note that the regression formula is inversely formulated. A negative value thus entails that it contributes positively to success. The more successful a facilitator is, the lower the value of y (*Predictor Values*, from hereto referred to as the PV) would be, while the unsuccessful facilitator would return a higher numerical value. For example, taking the PV for facilitators 1 and 2 in table 2 (F1 and F2), the model therefore shows that 1.077 (F1) $>$ -0.324 (F2), hence facilitator 2 is regarded to be a better performer in the facilitation scenario.

Table 2 in addition shows the *Customer Service Index* (CSI) scores. These scores represent the students' perceptions of the performance of their facilitators. While the multiple regression model makes use of only 8 (identified during 1999 as the vital attributes) criteria to predict success, the CSI employs all 30 criteria to derive at the scores shown in the table.

The last column in table 2 represents the *Performance Index* (PI), a standardised measure to enable meaningful comparison between facilitators. Standardisation is needed to eliminate possible discrepancies (such as the intellectual- or language ability, cultural diversity and commitment) between the different groups of students served by facilitators (Gregory 1996:35; Luck, Wales, Rubin & Taylor 1982:341–344). The PI is therefore a comparative measure that could be employed to judge facilitators fairly against one another.

The PI is calculated by dividing the average mark obtained by all students at a specific study centre in a specific subject (thus the mark all students obtained at that study centre whilst being facilitated by a specific facilitator), by the assessment of these students' average performance (namely the marks obtained by all of them in all the subjects they are studying via the telematic learning model – thus served by different facilitators). A PI value that exceeds 1, implies that the marks obtained by students in the subject facilitated by the specific facilitator, exceeds the average mark of the group of students in all their subjects. Therefore, it stands to reason that a value below 1 implies a lower than average performance, a value of 1 implies an average performance and that where values exceed 1, a better than average performance was obtained. The PI measurement is employed to determine the success of facilitators in terms of the marks that students obtained. Table 2 is sorted in descending order of importance, implying that the most successful facilitator (according to the forecasting model) is shown in the first row.

The statistical software *Statistical Analysis System* (SAS) was employed as analytical tool.

Table 2
Relationships between variables

Facilitator	Predictor value	CSI score	Performance index
F2	-0.32426	0.95	1.003
F22	-0.26707	0.988	1.002
F20	-0.18588	0.937	1.118
F23	-0.15923	0.967	1.116
F15	-0.03536	0.900	0.762
F18	0.05207	0.903	0.938
F12	0.11735	0.953	0.955
F16	0.17116	0.843	0.993
F17	0.21351	0.807	1.071
F13	0.25313	0.853	0.962
F19	0.27439	0.907	0.866
F5	0.32441	0.700	1.004
F25	0.37185	0.833	1.022
F14	0.42429	0.833	0.904
F21	0.44317	0.753	1.084
F24	0.54371	0.880	1.025
F4	0.98734	0.567	0.965
F9	1.03921	0.520	0.941
F11	1.03921	0.520	0.991
F1	1.07749	0.565	0.960
F7	1.14408	0.564	0.904
F3	1.22984	0.510	1.009
F8	1.46562	0.406	0.868
F10	1.46562	0.407	0.934
F6	1.59776	0.387	0.986

From table 2 it is evident that as the PV increases, in all instances the CSI decreases. Therefore a meaningful inverse relationship exists between the PV and the CSI values. This relationship is inverted because the forecasting model is inversely formulated, thus meaning that actually, a strong positive relationship exists between the PV and the CSI. This relationship is shown in figure 3. There seems to be no meaningful relationship between the PI and any one of the two other variables in table 2. The correlation coefficients shown in table 3, substantiate this reasoning.

Table 3 shows the calculated *Pearson Correlation Coefficients* (Wegner 1995:312) between the variables PV, CSI and PI.

Figure 3
Pearson correlation coefficients: PV and CSI

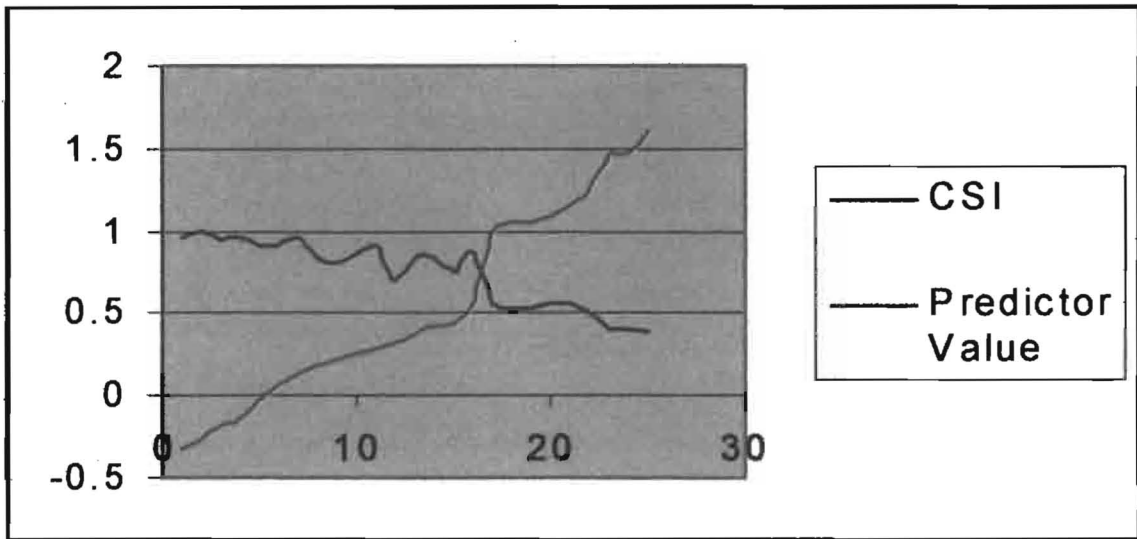


Table 3
Pearson correlation coefficients

Variable combination set	Correlation coefficient
PV and CSI	-0.964
PV and PI	0.208
CSI and PI	-0.254

From table 3 and figure 3 it is further evident that the strong relationship between the PV and the CSI ($r = -0.964$) is an inverse linear relationship (McDaniel & Gates 1999:596). The fact that the PV is reflected inversely by the forecasting model, implies therefore that a positive linear correlation of 0.946 exists between these two variables (Wisniewski 1997:321-323). The calculated correlation coefficients between the PV and the PI ($R = 0.208$) and the CSI and PI ($R = -0.254$) indicate that no meaningful correlation exists between these variables (Burns & Grove 1997:465).

CONCLUSIONS AND IMPLICATIONS

As shown in figure 2, the research set out to develop a model to forecast facilitation success. The second stage of the research (specifically addressed in this article) is to validate the forecasting model for use in appointment of successful facilitators in the telematic learning model. The results realise in the following conclusions:

- a strong positive relationship exists between the CSI and the PV of the model;
- no meaningful relationship exists between the CSI and the PI; and

- no meaningful relationship exists between the PV and the PI.

These conclusions result in the following implications:

- The forecasting model is a good predictive tool to employ in the measurement of customer satisfaction with a specific facilitator ($R^2 = 0.657$). It is therefore possible to employ the model in appointment of new facilitators to determine the level of satisfaction that students should have with their facilitator beforehand. The importance of this implication is that the university would be able to appoint new facilitators who adhere to customer satisfaction standards, and thereby eliminating the aspect of subjecting students for the duration of the appointment to a "customer incompatible" facilitator. The benefit of the model is thus twofold, namely to spare students the agony of an incompatible student/facilitator scenario, and as a result, a reduction in complaint behaviour to be managed by the university.
- The inability of the forecasting model to measure facilitation success also provides a new lead for future research. Firstly, the measurement of success in terms of a standardised index of the marks obtained, could be a pitfall. Although the theory to do so seems sound, the *definition of success* itself in terms of marks obtained could be a too conservative approach. Aspects such as fellowship, study-group dynamics, employer-peer guidance and socio-economic support systems could influence the perceptions of success obtained through studies under guidance of a specific facilitator. In this regard Landy and Trumbo (1980:17-19) points out that value judgementalism of students and the facilitator could also play a

role in the terminology used to describe performance (success), while Stevenson refers to the problematics of perceiving successful performance in measurable terms. Stevenson (1987:17–19) further describes successful performance as a much more complex operand in behaviour/reward contingency than at first meets the eye. Success could thus also be part of the behavioural or social rewards reaped from the facilitation scenario than the clinical measure of marks obtained (measured in an index number). Secondly, the forecasting model could be naïve in the sense that it ignores some human behavioural aspects. In Coetsee (1996:117) the concept of *Loci of Control* is referred to as the human trait to “*ascribe responsibility to, or blame for what is happening to you*” either to yourself or outside factors. An internal *Loci of Control* refers to a person who accepts responsibility for his situation and the belief that the majority of the situational factors could be either controlled or at least be managed (Gregory 1996:504). As a result, additional qualitative research in the form of unstructured interviews was undertaken to explore the specific topic (amongst MBA final year students and facilitators) as one possible reason for the forecasting model’s partial failure. According to De Witt and others (2001), the obtaining of a good mark in academic studies remains the responsibility of the student, and not that of the facilitator. If a facilitator does not perform well, students have reverted to alternative means to obtain the knowledge required. Actual examples of such action were to increase the study-group meetings for the specific course, visiting the lecturer (course unit manager) at the university for a one- or even two-day study session while one group even hired an external course specialist for a number of teaching sessions to obtain the needed knowledge. Such actions clearly indicate that these students (bearing in mind that they are MBA students) took control of their own academic destiny, thereby supporting Coetsee (1996:117–119) in his view of internal loci of control. It therefore seems that the forecasting model should shift its focus towards human behaviour in addition to the performance criteria currently employed.

- Due to the high correlation ($R = 0,964$) between the PV and the CSI, the CSI measuring instrument could be reduced to the criteria employed by the forecasting model. This should result in a better response rate due the reduction in time to complete the questionnaire.
- A final implication evident from the results is that a facilitator may be regarded as incompatible to students (low CSI and PV scores), but he/she

maintains a good academic index (PI). In table 2, Facilitator 3 (F3) represents such a scenario. Although a minority group in the analysis, these facilitators manage to do well academically, but at a cost of customer satisfaction. The abovementioned qualitative research revealed that one such a facilitator (F3), simply refuses to continue with facilitation and withdraw his support totally if students attend his facilitation classes unprepared. He merely reschedules the meeting for another (preferably inconvenient!) time in order to reach the outcomes set by the Course Unit Manager. Therefore, although the academic results are above average (by employing an outcomes-based approach to facilitation as suggested by Olivier (1998:4)), the compromise on customer service is reflected in the low CSI and PV values.

SUMMARY

The value of the research is significant. The empirical evaluation accredited the forecasting model partially whilst also highlighting its inept weaknesses. In addition, the evaluation also directed research into new horizons in the forecasting of facilitation success. The research concluded that:

- the forecasting model is successful concerning the CSI value and a high positive correlation exists ($R = 0,964$);
- the model could not be employed to forecast academic success of as a function of facilitation;
- the questionnaire of 30 criteria (CSI measurement) could be reduced to only those identified by the forecasting model due to the abovementioned high correlation between these two variable sets;
- the definition of success in facilitation is too conservative and should be extended towards other human behavioural characteristics; and
- academic success by facilitators not necessarily implies a high level of customer satisfaction.

The initial purpose of the research to enable the managerial approach to move from a retrospective to pro-active approach whereby corrective measures should be taken before or during courses and not after the course, is partially successful. Although already beneficial to the university as agent of quality education, the research should continue in a new direction, namely that of human behaviour to incorporate other influences than just the performance measurements of facilitators as academic expansion of the lecturer. Ultimately, the students deserve the best education possible to contribute to the maximisation of the country’s human capital.

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