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Effects of Supervised Reflective Practices on Teaching Quality and Student Satisfaction in Aviation Education Context

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Abstract

The higher education sector is under tremendous pressure in this era of automation and online learning. Consequently, major innovations in teaching and learning practices are required for the survival of universities. This paper explores the possibilities and benefits of supervised reflective learning for an academic to improve teaching quality and student satisfaction. In view of identifying a suitable leadership style for the supervision, this study discusses few theoretical concepts of leadership styles in higher education context while analysing the effects of leadership guidance on reflective learning of an academic and its outcomes. To this end, focused interviews of academic leaders, series of reflective exercises and a student survey were done choosing aerospace engineering discipline at a university. The results indicate that the reflective exercises under leadership supervision enhance teaching and learning quality of an academic, and they can also assist in improving student satisfaction.

Keywords

Academic, Aviation, Education, Engagement, Leadership, Reflection, Student, Teaching, University

1. Introduction

One of the difficult issues in higher education sector is the contrast between teaching and research goals. Nevertheless, some researchers argue that teachers do not exist only for students, instead both have their reasons in pursuit of knowledge (Barnett, 1992; McCaughey, 1992). As a result, both research and

teaching go side by side. Recent trend indicates that academics focus more on research than teaching duties (Hattie & Marsh, 1996). This undermines teaching delivery and affects the quality of teaching and student satisfaction in addition to growing aloofness of industries about higher education. Horta et al. (2012) found that many studies have investigated how research affected teaching, but other way round investigations are rare. However, Zhang and Shin (2015) believe that teaching experience of an academic can also contribute to his or her research work, because research-teaching nexus does exist. Few studies do argue that a positive relationship exists between teaching and research that improves teaching quality (Turk & Ledić, 2016). Likewise, opposite views are also present. Furthermore, most universities' academic reward structures do not support teaching excellence. Intensifying the problem, universities are experiencing survival pressures due to ever advancing educational automation tools and self-propelled online learning by potential students. Hence, certain comprehensive innovations in teaching and learning processes need to be discovered as one of the possible solutions to deal with the pressure. Thus, this study probes a possibility of implementing an innovative idea of leadership-supervised reflective learning for an academic to improve teaching quality and student satisfaction. Intervention and support of academic leadership become important in these situations. Outcomes of this also depend on leadership traits, such as effective planning, presenting a clear and strategic vision and building consensus in addition to styles of leaderships. Primary objective of this paper therefore is to examine the effects of the supervision on teaching effectiveness of an academic and on student satisfaction because of the reflective practices.

Keeping students in the centre, a student satisfaction survey was carried out in two stages on five different student cohorts at a university in China to monitor the effects of the reflective practices on students. Undergraduate students of aerospace engineering field were chosen, and an aerodynamics module was selected for this study to observe student engagement and satisfaction. Besides, various peer observations of the reflective exercises were carried out to ensure the quality of the practices. Likewise, a series of focused discussions with relevant academic leaders was also done to gauge the influence of leadership input. The survey questionnaire named as student evaluation of module (SEM) was designed to cover questions related to module organisation, subject matter content and teaching delivery process. The SEM was appraised to assess the influence of resultant reflections on teaching quality to validate the effects of influence of reflective practices on student satisfaction and engagement. Feedback from the first stage survey indicated that the student satisfaction for the module was low and the student participation was dropping consistently within consecutive three years. Students did not feel that the module content was challenging and well organized. This indicates that certain key elements of teaching quality and subject content need improvement. Consequently, module was redesigned, and the module assessment components were changed from examination-heavy to laboratory assessments and coursework. The observation from the reflective exer-

cises and the academic leadership input also instigated this. The second stage survey made of two components was carried out on two different cohorts to check the effectiveness of the changes. Both cohorts demonstrate a progressive improvement in student satisfaction outcome.

Recognising the importance of leadership intervention in reflective learning, this study identifies a suitable academic leadership style to ensure an effective supervision for the reflective practices. After examining various types of academic leadership, styles this study finds that transformational leadership can provide an efficient supervision in this situation, because it works on motivation of employees. Opposingly, a top-down approach may lead to the staff being intimidated. Likewise, the distributed leadership style may also work, because it leads to a faster development of staff and the organisation. A key challenge this study has observed is a transition from instructional leadership to transformational leadership, but an instructional leadership can be more effective in achieving desired goals in certain industries. Finally, this study finds that the leadership supervision of reflective learning practices helps in improving teaching quality and student satisfaction in addition to other generic benefits that it brings to an academic in developing his or her academic career.

2. Theoretical Concept for Supervised Reflective Practices

Higher education sector is under pressure currently due to changing industry expectations for graduate attributes and rapid technological advances that bring strain on academic practitioners. Primary attribute is the industry readiness of university graduates. Academic institutions subsequently need to align their capabilities to the expectations and respond to the industry demands. Consequently, innovations in teaching and learning practices have becomes critical to the survival of the institutions. It has been well established that benefits of reflective practices to an academic are not only to improve their teaching quality, but also to enhance student engagement in learning activities. Peer observations and reflective learning has been in place in academia for long, but no significant innovation has been done on this since years. Similarly, the benefit of subject-matter related research-based teaching to overall teaching quality and student learning is also debatable, because there are reasoned arguments supporting many possible permutations relating the quality of teaching to research. That mean the relationship is both positive and negative at the same time. In addition, Marsh (1979, 1984) claims that there is an insignificant relationship between the two. That makes more innovation and continuing improvement in current teaching and learning practices necessary.

Reflective practice is an active process of attending to one's own experience of teaching. At the same time, it is an effective professional development process for achieving behavioural change. According to Osterman & Kottkamp (1993), reflective practice often confused with reflection, is neither a solitary nor a relaxed meditative process. To the contrary, it is a challenging, demanding, and

often trying process, which is most successful as a collaborative effort. Likewise, Bo (2013) argues that leaders at a university should assist academics in setting reasonable goals to promote their autonomous motivation and self-efficacy that may improve their work performance. Without this, even a transformational type of leadership can be ineffective and produce negative effects to the organizational commitment and job satisfaction of an academic, the researcher believes.

Therefore, this innovative project investigates the possible effects of supervised reflective practices of an academic on student engagement and on teaching practices of the academic as well. In other words, the study scrutinises the influence of leadership input on the reflective exercises carried out by an academics to improve content and delivery of teaching at a university. Enough research available in public domain about peer supported reflective practices, but there are not enough data present on supervised reflective practices in the literature. Therefore, this project attempts to integrate student feedback and leadership input in reflective exercises to find out their influences on an academic and students in terms of teaching quality and engagement, respectively.

Likewise, the study endeavours to identify a suitable leadership style in this context. For example, among various types of leadership styles, identifying the best that provide most effective input in the reflective tasks is a challenging question in certain cultures. Ample information available about the differences between successful and effective leaders in corporate world, the distinction between the two in higher education is still blurred (Luthans, 2011). Therefore, choosing a leadership style in academia for this kind of supervision is not straight forward, because leadership role in higher education too has been evolving and becoming more inclusive and empowering that requires active collaboration and participation (Hazari, 2020). For example, according to Luthans (2011), successful leaders need not be the effective leaders and vice versa. The key difference between successful and effective leaders would be the ability to inspire and mentor team members to achieve desired goals. Though the term is used interchangeably in academia, the effective leaders tend to understand the roles and personalities of their colleagues along with the function of specific jobs in large organisations like universities (Kouzes & Posner, 2006). According to Goldring & Greenfield (2002), leadership in academia is complicated by the dynamic social, economic and policy contexts under which universities operate. Therefore, successful leadership in higher education requires a leader that acknowledges the dynamics and unique factors of their campus environment. Research literature also suggests that successful-effective academic leaders should not only have a knack of assessing student needs but should also be able to conduct evaluations of programmes and services and provide decisive responses within consensuses and legalistic framework (Smith & Hughey, 2006). The researchers also highlight that successful academic leader must have skills to control resources effectively while achieving the institution's goals.

Most departments of a typical university operate independent of their central administration, thereby academics become more loyal to the research funding agencies than their institutions (Smith & Hughey, 2006). As a result, successful education practices would require the leader to motivate staff to help improve the institution rather than focusing on ensuring success of the external funding agency. Thus, it is important for a successful leader to emphasize the importance of the role of an academic as both a researcher and a teacher (Smylie, Conley, & Marks, 2002). Previous studies also confirm that effective leaders need to adopt a more authoritative style of leadership when working with administration, but act as a facilitator when dealing with academics (Smith & Hughey, 2006).

For example, instructional leadership concept uses a central figure as the educational leader. The leader provides vision and direction for the institution while being accountable for teaching and learning quality. Consequently, the leader may render inefficient, because ever increasing administrative tasks cause distraction for teaching and learning. Researchers have found that the success of instructional leadership is subject to effective interpersonal skills being demonstrated by the leader (Le Fevre & Robinson, 2015). Opposingly, the distributed leadership model focuses on diffusing the center of leadership and distributing it to several members of their team. This model leads to an empowerment of individual academics, promotes synergy amongst individuals and improves sense of responsibility (Townsend, 2019). Studies have confirmed the effectiveness of transformation leadership in higher education, because it focuses more on motivation of their workforce without the need for micromanagement (Al-Husseini & Elbeltagi, 2016; Bo, 2013; Bakar & Mahmood, 2014). Generally, it ponders behavioural attributes, such as idealised influence, inspirational motivation, intellectual stimulation, and individualised consideration (Gozukara, 2016). The idealised influence aims to enhance role modelling and trust building while inspirational motivation defines a clear vision to meet targets of their institution, but intellectual motivation challenges the creativity of the employees and bring about a positive change in their thought process. Likewise, individualised consideration ensures that the talent and skills of every academic are recognised and developed. This goes along with the distributed leadership theory whereby the responsibilities are distributed amongst their team. The distributed leadership therefore provides opportunities to take responsibilities within the organisation allowing early career academics to grow in their role and become decisive in their conduct. Culture also plays an important role in maintaining effective leadership in academia. During the reflective practice, it was observed that leadership values are also influenced by social and ethnic cultures. A successful leadership model in one country may not work in another. For example, significant differences exist between leadership priorities in Western societies and former Soviet Union including East Asian countries. Ardichvili and Kuchinke (2002) argue that East Asian institutions require a more authoritative leadership especially when dealing with administration, but leadership in western countries has a low power distance inequality (PDI). That means the degree of inequality be-

tween leaders and employees and leadership tends are more individualistic (IND). The leadership style in the west is more laissez-faire, but it has poor long-term organisation (LTO) and it lacks a strong structure for uncertainty avoidance (UA). Thus, to be an effective leader, one needs to be aware of cultural and the socio-economic factors and tailor their leadership style according to these factors. The focused interviews as a part of this study while carrying out reflective exercises ascertained that distributed leadership and delegation of authority also proved productive in the university environment.

This project was also guided by contingency theory of management suggested by Fred Edward Fiedler in 1964 (Virkus, 2009). Fiedler examined leaders in different circumstances but predominantly in militaristic terms and their form is founded on their study outcomes. This model asserts that there is no better form of management; instead a manager's efficiency is founded on the circumstance (MindTools, 2021). Having a contingency plan means having an established structure for what transpires when things go wrong, who works where and how to come out of a dire situation safely and successfully. It is having a self-assurance that the eventuality or mitigation plans that are established will work for any situation and that their resources are always profited from. Since there is no defined process of how to handle situations as one, each organization ought to identify their leadership style, identify their solutions and then determine the practical idiomatic expressions to employ in that situation (MindTools, 2021).

According to Mrusek (2017), the contingency theory assumes institution's performance as a role of reciprocities intercompany inner and outer constructs which can be categorized as environmental, resource, and management practices. The researcher however concludes that the contingency theory is a suitable setting specially to survey the effectiveness of a joint leadership. Piyu (2019) on the other hand states that contingency theory regards the affiliation between organization and outside environment to permeate the lapses of system theory. This theory is widely applied in areas like resource, finance, leadership and in organizational management facets. The theory leads to believe that a suitable leadership style needs to be identified depending on problems and situations.

Consequently, this project has identified that inputs from an instructional leader worked for curriculum development, but establishing laboratories require a great deal of collaborative and persuasion skills owing to differing opinions amongst co-workers that improved the desired outcomes. Effective leaders are good listeners and are proactive in making changes (Watt, 2009). Therefore, based on student feedback, the module update was suggested and discussed with the supervising leadership. Additionally, application of transformational leadership theory had enabled building trust and provided a clear vision for achieving teaching and learning goals. The management literature on higher education clearly shows that the behaviours of an academic leader have significant effects on faculty and university development (Çetin & Kınık, 2015). There is an ongoing debate however regarding the most appropriate leadership style in academic

environment, and it is not surprising that the dominant theory in the literature is transformational leadership theory (Gozukara, 2016).

3. Methodology and Data Analysis

Aerospace and aviation is a safety critical and a technologically advanced industry that possess high operational risks and technical decisions must be taken diligently and correctly at every occasion. As a Therefore, students of this field must possess appropriated communication skills, teamwork abilities, quick and accurate decision-making capabilities, and stringent subject-matter knowledge. Consequently, the education in this major should develop and convert evidenced based knowledge into practical applications for students accurately. Hence, this study on the innovative reflective practices of supervised reflection learning has been carried out at a newly established aerospace academic unit in in a Chinese university. Subsequently, to examine the effectiveness of these study objectives, student cohorts from aerospace field has been chosen. More specifically, an aerodynamics module coded as AERO1002 was selected for the project. The module requires students to participate in team tasks, and a series of laboratory sessions in addition to traditional lecture-based teaching. Science and engineering students are expected to regularly use theoretical knowledge gained in classrooms to design, build, and develop a product (Kyere, 2017). The module involves analytical reasoning to augment problem-solving skills in addition to generic engineering topics required for professional engineering practices to achieve results. Science technology engineering mathematics (STEM) research over the past two decades has indicated that students should get an opportunity to investigate and ask questions about the world they observe in their daily life to develop interest in STEM subjects. Group problem solving can play a key role in improving the quality of a study module. Wieman and Perkins (2005) propose that successful engagement can be brought about posing a question and encouraging learners to work together and come up with a consensus response. Similarly, another strategy that can drive the engagement and pique interest in a module is peer instruction (Crouch & Mazur, 2001). This is important at Chinese universities, because learners do not academically interact and engage with their peers enough. Consequently, they look at their leaders or supervisors for developing the structure for their learning.

Therefore, to investigate student engagement and collect some critical feedback, participation of students was sought along with reflective practices' activities of this project. Consequently, a two-stage survey using a student satisfaction questionnaire was carried out on undergraduate aerospace engineering students. The questionnaire was an online, voluntary, and anonymous survey asking questions about module content and teaching delivery. Therefore, the SEM scores of five consecutive cohorts of this module have been collected and examined. Collected responses were based on five questions and seven key questions for the first stage survey and the second stage survey, respectively (**Table 1** and **Table**

2).

Consequently, the cohorts were divided into two groups, where the first group included 105 students belong to three cohorts and remaining two cohorts were included in the second group. The second group contained 74 students. Therefore, the total target population was 189 students (Table 3). The first stage survey using the Group 1 students was carried out and the running course content was utilised, but the second stage survey using Group 2 students was done with a modified course content in order to get students' views on the change. An extra question has been added in the questionnaire of the second stage survey to receive subjective feedback from the students (Table 2). Students were chosen as the survey participants, because examining student feedback is detrimental for

Table 1. Question set for the first stage survey.

Number	Nomenclature	Text
1	P1	The module has provided me with opportunities to explore ideas or concepts in depth
2	P2	The module has challenged me to deliver my best work
3	P3	The module has been well organised and has been running smoothly
4	P4	The resources in Moodle for this module have helped me to complete my work
5	P5	The criteria used in marking my work have been made clear to me

Table 2. Question set for the second stage survey.

Number	Nomenclature	Text
1	Q1	The module was engaging and interesting
2	Q2	The learning objectives of the module were clear
3	Q3	The module materials and activities helped me to learn
4	Q4	The module was well managed and ran smoothly
5	Q5	The workload on this module was appropriate
6	Q5a	Do you feel there was too much, or too little work involved?
7	Q6	Please comment on the above and provide any other feedback on the module

Table 3. Target population.

Category/Strata	Target Population
Group 1—Three cohorts. First stage survey	105
Group 2—Two cohorts. Second stage survey	74
Total number	189

an academic in improving his/her own teaching and learning skills. It is also demonstrated by student engagement in classroom learning activities.

The research did not implore information on demographic characteristics of the respondent and the questionnaires did not collect information on respondents' gender, age, nationality, or ethnic background. Necessary consent and ethics prior approvals were taken from participants and relevant authorities for data collection. Likewise, the participation in the survey was voluntary and anonymous. The calculated sample size of the study was 128 out of the 189 total target population. A sample size identifies the number of subjects that need to be included within a sample, because formulating a true size is important for achieving an acceptable outcome (Qualtrics, 2020). Therefore, primary purpose of a sample size is to get results on all elements of a study. The Yamane formula-1967 as shown in Equation (1) can be used for calculating a sample size (Israel, 2003).

$$n = \frac{N}{1 + N(e)^2} \tag{1}$$

where, n = sample size; N= population size; e = margin of error

$$n = \frac{189}{1 + 189(0.05)^2}$$

$$n \simeq 128$$

Assuming a confidence level of 95%, a marginal error of ± 5% is acceptable, However, due to the small size of the cohorts, the surveys were done on the full strength of the cohorts instead of using the sample size. Likewise, the stratified sampling technique that divides the target population into two strata was used and the questionnaire was delivered online (**Table 3**). The structured questionnaires contained primarily closed questions using a Likert scale of 1 to 5, where 1 = Strongly Disagreed, 2 = Disagreed, 3 = Neutral, 4 = Agreed, and 5 = Strongly Agreed. The qualitative comments requested as part of the survey complemented the data, but there were not enough comments made by the respondents though. Guidance information about the survey were provided to the participants.

Questionnaire return rate was high for the first stage survey, but the rate was generally poor for the second stage survey (**Table 4**). First stage survey group of 105 respondent reported enthusiastically with a 100% response rate. On the other hand, participation of the first and second cohorts of the second stage was not promising with the return rate of 46.5% and 51.6%, respectively. Similarly, the question Q6 also did not receive enough responses. This indicates that students were not strongly engaging or demonstrating their interest in providing the feedback, even after the incorporating the planned course content changes.

Figure 1 shows a dropping trend of student satisfaction for the module across the three cohorts and finally fell below the university average. The satisfaction for the cohort 1 and cohort 2 were above the university average albeit dropping with each successive cohort. Aggregate score of the questions by these cohorts

Table 4. Questionnaire return rate.

Questionnaire Return Rate responses		Frequency	Percentage
Group 1—Three cohorts. First stage survey	Number of questionnaires returned	105	100%
	Number of questionnaires retained	0	0%
	Number of questionnaires administered	105	100%
Group 2—First cohort. Second stage survey	Number of questionnaires returned	20	46.5%
	Number of questionnaires retained	23	53.4
	Number of questionnaires administered	43	100%
Group 2—Second cohort. Second stage survey	Number of questionnaires returned	16	51.6%
	Number of questionnaires retained	15	48.3
	Number of questionnaires administered	31	100%
Total number of questionnaires administered		189 (105 + 43 + 31)	100%

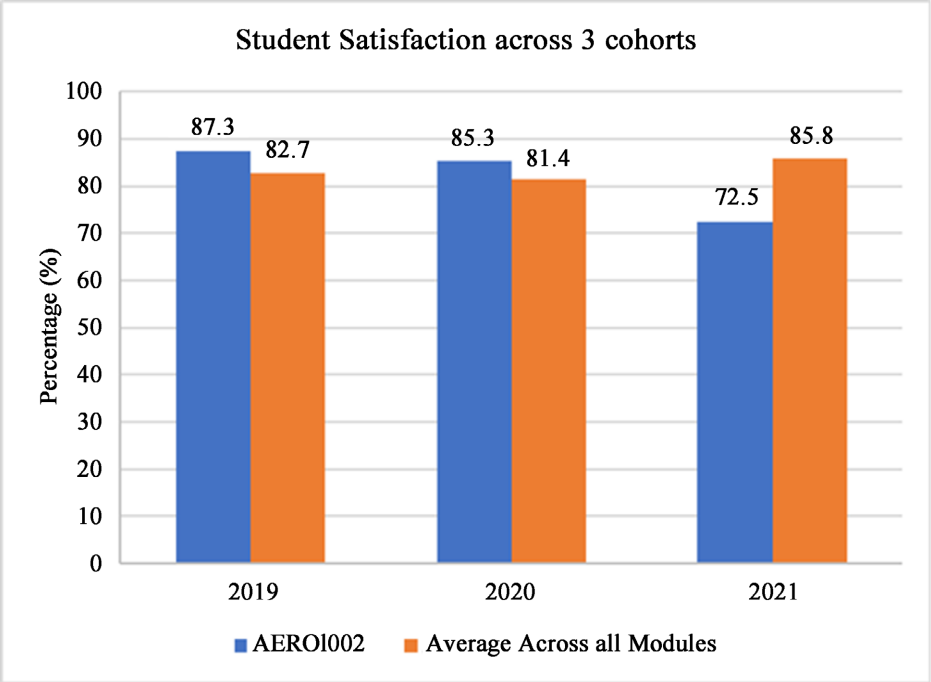

Figure 1. Student satisfaction of module AERO1002 as compared with the university average.

Table 5. Average scores for group 1 first stage survey.

P1	P2	P3	P4	P5	Aggregate Score	Aggregate Percentage
3.83	4.00	4.00	3.83	3.83	19.49	73.5%

73.5%. This is not promising (Table 5). This demonstrates that by the end of cohort 3, there was dissatisfaction amongst the students with the module organisation, content, and delivery. Consequently, the assessment of the module was modified in accordance with student feedback and leadership inputs making it more challenging and inclusive by providing students a range of assessment

formats. It has also been suggested to adjust the assessment weightage more equitable rather than making it examination heavy.

Consistent dropping trend of student satisfaction provides a strong ground to make improvements in the module content and delivery method. Some key elements for a review can be the module content to provide more opportunities to the students to study subject-concept in depth, structure of the module to engage and challenge students and more inclusive module design. Underpinning the feedback, a series of multimodal discussions with the leadership and peers were carried out and inputs from the leadership were sought. As a result, few ideas, such as more practical based hands-on content were introduced to enable students to correlate theoretical concepts with real-life examples. It was believed that a larger practical component would not only make the module more engaging, but also a coursework associated with the practical sessions would ensure that the students were sufficiently challenged. According to Kachani et al. (2020), some teaching strategies that can be used to make the course more inclusive include offering a range of assessments that provide students with multiple means of action and expression.

The leadership input also indicated the examination-heaviness of assessment, related to the module. Therefore, the assessment was divided into various components including a lab task analysis worth 20%, a collated coursework based on the lab task worth 30%, a group project and in-class presentation worth 15%, and a final written examination worth 35% marks. By reducing the final examination to 35% and by ensuring that the students are offered a more diverse range of assessment format, the module becomes inclusive for all types of learners, and it is suitably engaging for the entire cohort. The second stage survey therefore was conducted after implemented module content and assessment weightage changes for the latter two cohorts belong to group 2. Evaluation of responses of this stage was more comprehensive examining the answers to each individual question of the questionnaire (**Table 6** and **Table 8**). Aggregate score of the questions by the first cohort of group 2 is 75.5%. This shows an improvement in the student satisfaction (**Table 7**).

To assess further, the individual questions are visualized using bar charts. According to **Figures 2-6**, for question Q1, 50% respondents strongly agreed, 15% agreed, 25% were neutral, 5% disagreed while 5% strongly disagreed about the module engaging statement. Similarly, for question Q2, 45% respondents strongly agreed, 30% agreed, 15% were neutral, 5% disagreed while 5% strongly disagreed about learning objectives of the module. For the question Q3, 50% respondents strongly agreed, 20% agreed, 20% were neutral, 5% disagreed while 5% strongly disagreed about the module material. Likewise, for the question Q4, 45% respondents strongly agreed, 25% agreed, 15% neutral, 10% disagreed and 5% strongly disagreed about the module management. Finally, for the question Q5, 45% respondents strongly agreed, 25% agreed, 25% neutral, none disagreed and 5% were strongly disagreed about the module study workload. The total score demonstrates a reasonably acceptable student satisfaction rate where more than

Table 6. Breakdown of responses of group 2 first cohort of the second stage survey

Q1	Q2	Q3	Q4	Q5	Q5a	Q6
1	1	1	1	1	Too much	Too many essays in this module
2	2	2	2	3		
3	3	3	2	3		I can't use the flight simulator because I am not in China, yet I am still required to have the flight simulator exam. It is not fair for me
3	3	3	3	3		
3	4	4	4	4		
3	3	3	3	3		
3	4	4	4	4		
4	4	5	4	4		
4	4	4	4	4		
4	4	4	4	4		
5	5	5	5	5		
5	5	5	5	5		
5	4	3	3	3		The off-campus student could not really participate during simulation labs and project weeks
5	5	5	5	5		
5	5	5	5	5		No
5	5	5	5	5		
5	5	5	5	5		No
5	5	5	5	5		
5	5	5	5	5		
5	5	5	5	5		

Table 7. Average scores for group 2 first cohort of the second stage survey.

Q1	Q2	Q3	Q4	Q5	Aggregate Score	Aggregate Percentage
4.00	4.05	4.05	3.95	4.05	20.10	75.5%

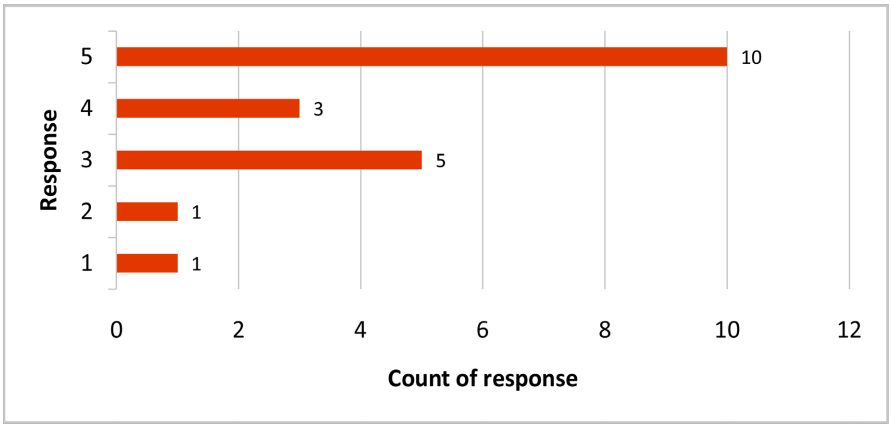

Figure 2. Response to Q1—group 2 first cohort of the second stage survey.

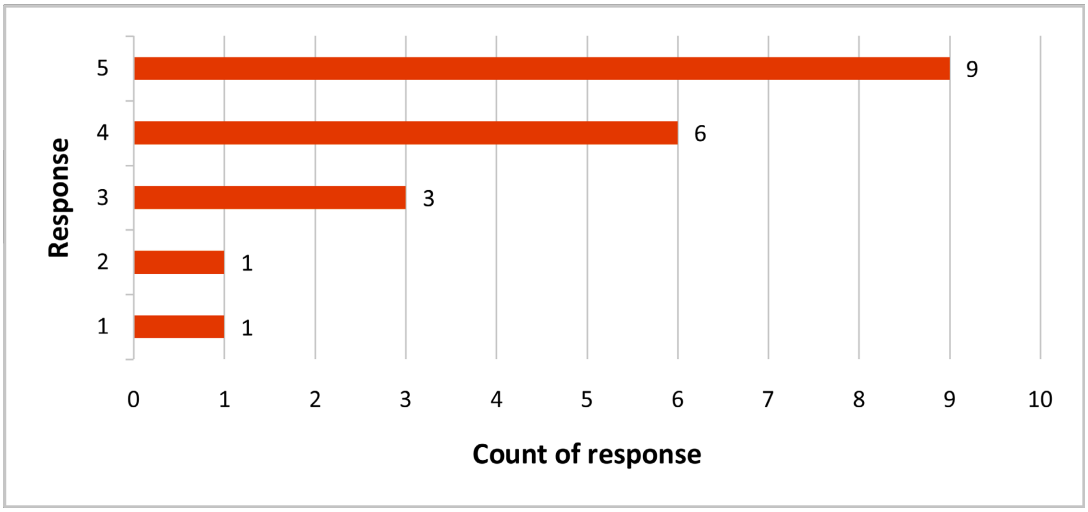

Figure 3. Response to Q2—group 2 first cohort of the second stage survey.

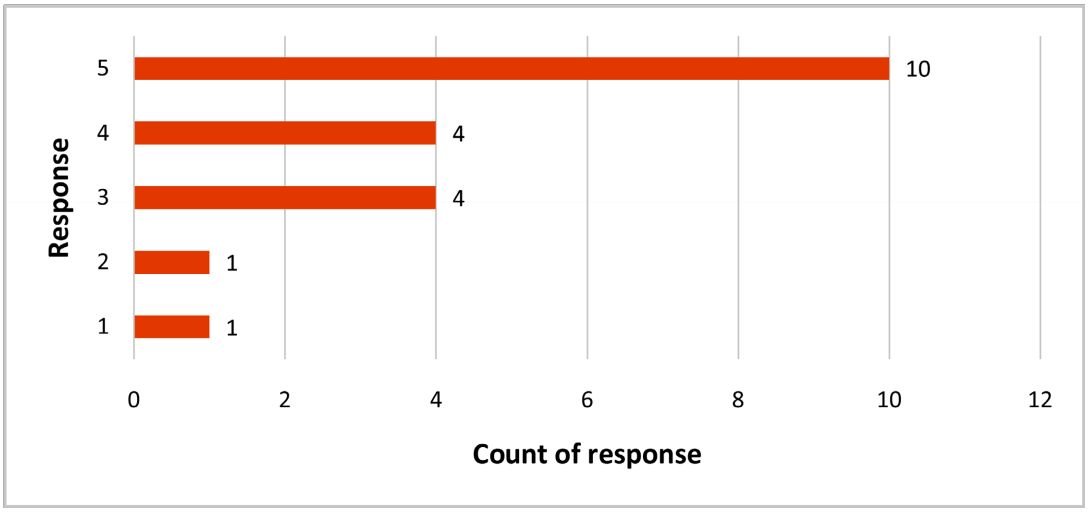

Figure 4. Response to Q3—group 2 first cohort of the second stage survey.

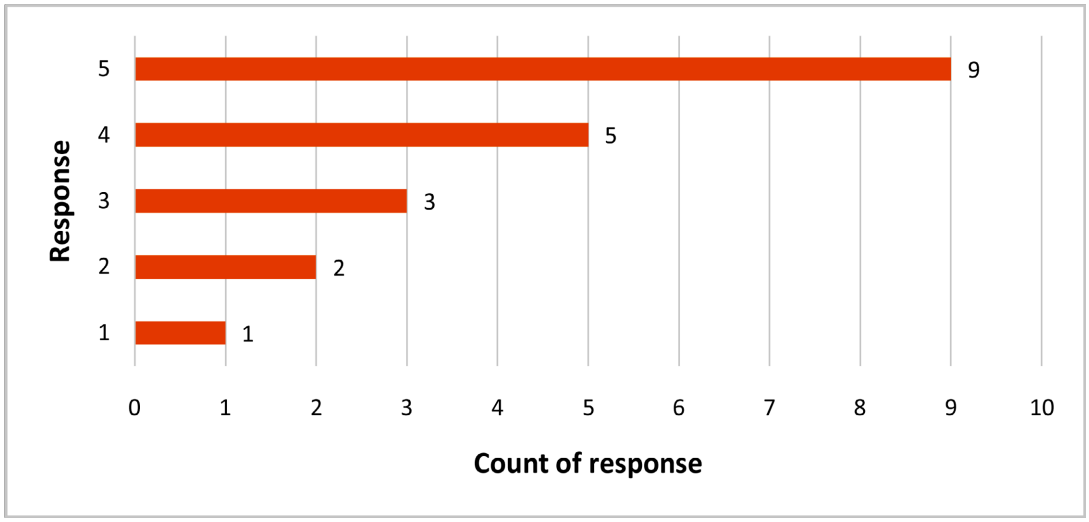

Figure 5. Response to Q4—group 2 first cohort of the second stage survey.

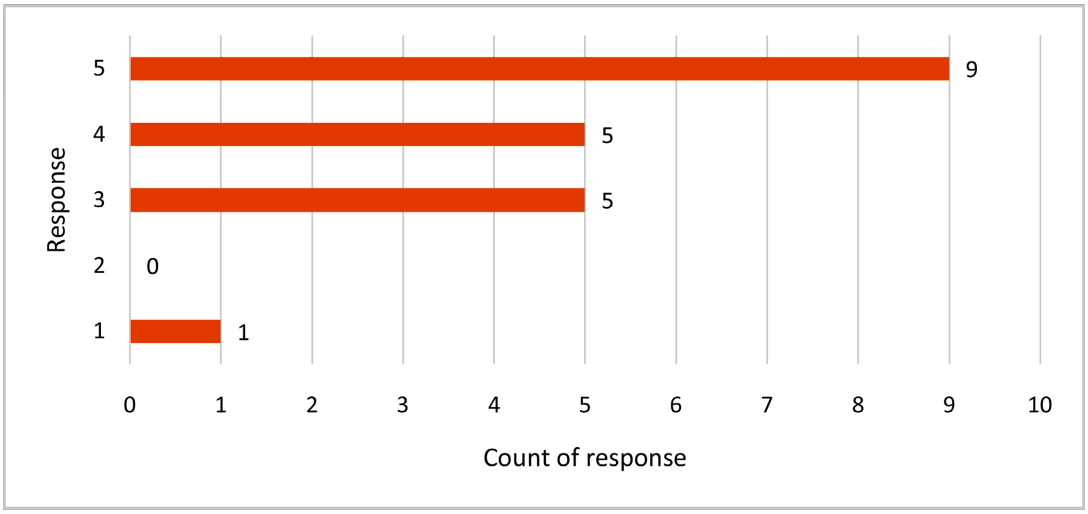

Figure 6. Response to Q5—group 2 first cohort of the second stage survey.

Table 8. Breakdown of responses of group 2 second cohort of the second stage survey.

Q1	Q2	Q3	Q4	Q5	Q5a	Q6
2	4	1	2	1	Too much	
3	3	2	2	2	Too much	
3	4	2	3	4		
4	4	4	4	4		
4	4	4	5	5		
4	4	3	4	4		
4	3	3	3	4		
4	4	4	4	4		
4	4	4	4	4		
4	4	4	4	4		
5	5	5	5	5		
5	5	5	5	5		
5	5	5	5	5		
5	5	5	5	5		
5	5	5	5	5		
5	5	5	5	5		Everything is fine

Table 9. Average scores for group 2 second cohort of the second stage survey.

Q1	Q2	Q3	Q4	Q5	Aggregate Score	Aggregate Percentage
4.12	4.25	3.81	4.06	4.12	20.36	76.8%

75% students agreed with the module content and delivery.

The questionnaire return rate of the second stage survey comprising of student group 2 second cohort was 51.61%. Total number of the participants that returned the questionnaire was 16 out of 31 (Table 8). Furthermore, Table 9

shows that the participation was not promising, but an improvement is noticed in the aggregate score for the questions, which is at 76.8%. The improvement indicates a slight increase in the student satisfaction rate.

Further exploration of the individual questions' responses using bar charts confirms the improvement as compared with the previous cohort. Figures 7-11 show that for question Q1, 37.5% respondents strongly agreed, 43.75% agreed, 12.5% were neutral, 6.25% disagreed while none strongly disagreed about the module engaging statement. Similarly, for question Q2, 37.5% respondents strongly agreed, 50% agreed, 12.5% were neutral, 0% disagreed while none strongly disagreed about learning objectives of the module. For the question Q3, 37.5% respondents strongly agreed, 31.25% agreed, 12.5% were neutral, 12.5% disagreed while 0.25% strongly disagreed about the module material. Likewise, for the question Q4, 43.75% respondents strongly agreed, 31.25% agreed, 12.5% neutral, 12.5% disagreed and none strongly disagreed about the module management.

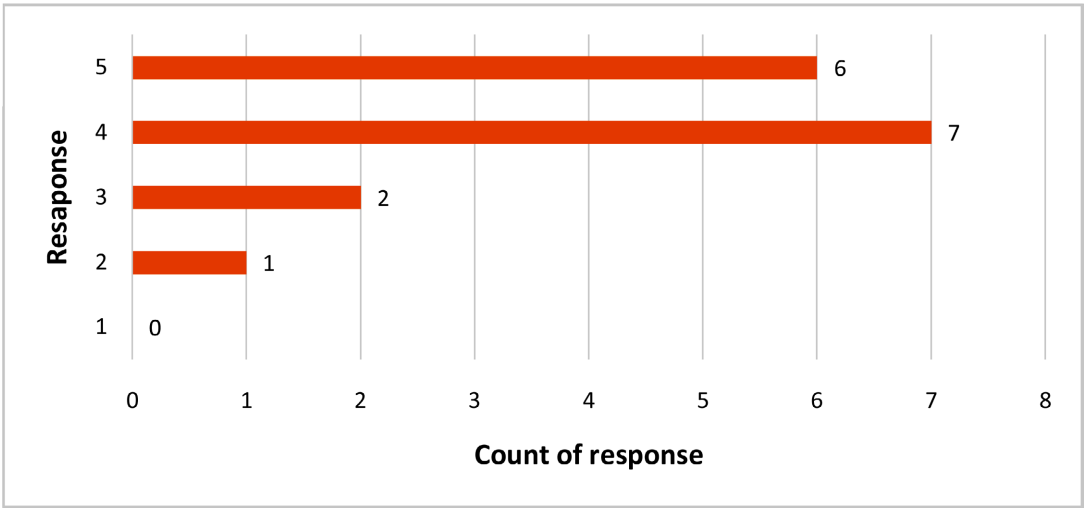

Figure 7. Response to Q1—group 2 second cohort of the second stage survey.

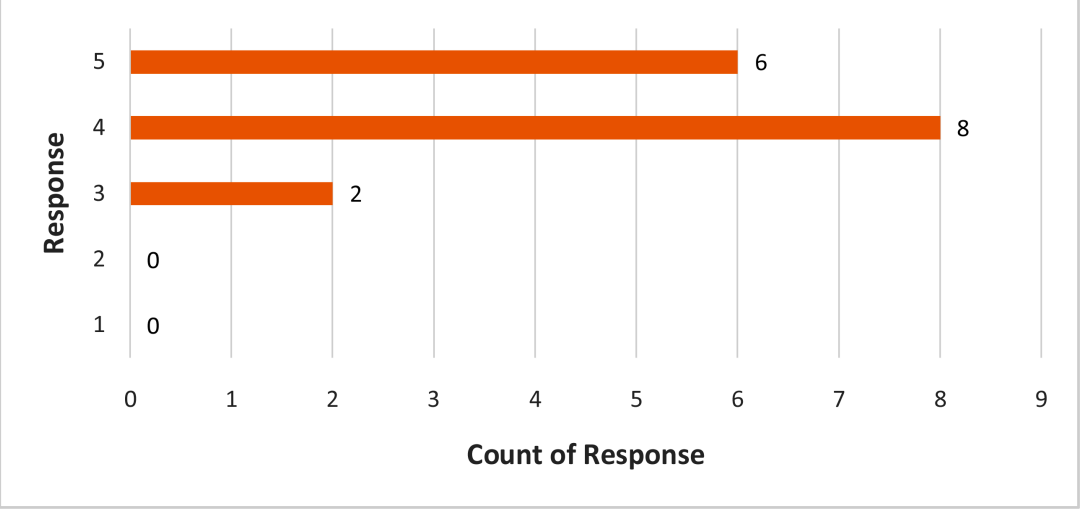

Figure 8. Response to Q2—group 2 second cohort of the second stage survey.

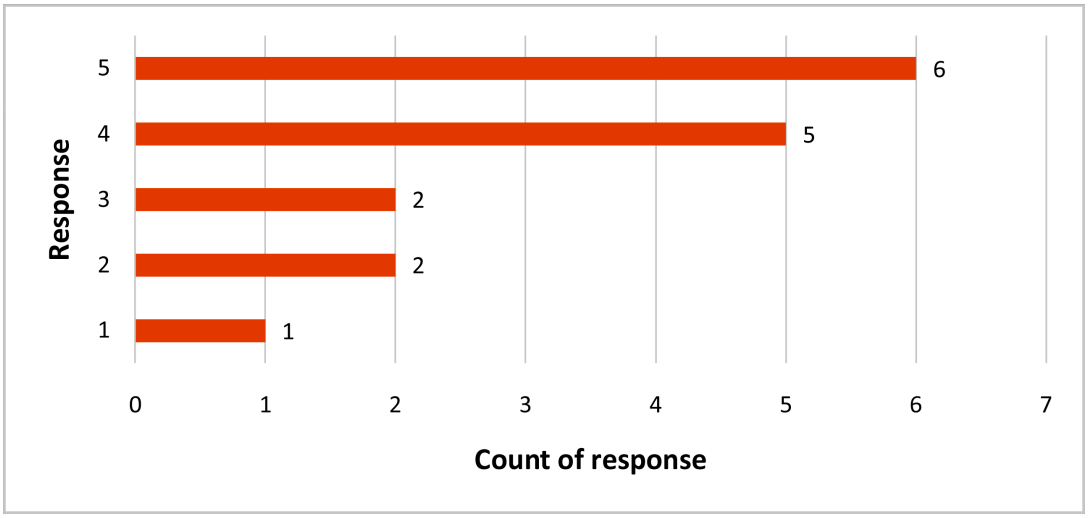

Figure 9. Response to Q3—group 2 second cohort of the second stage survey.

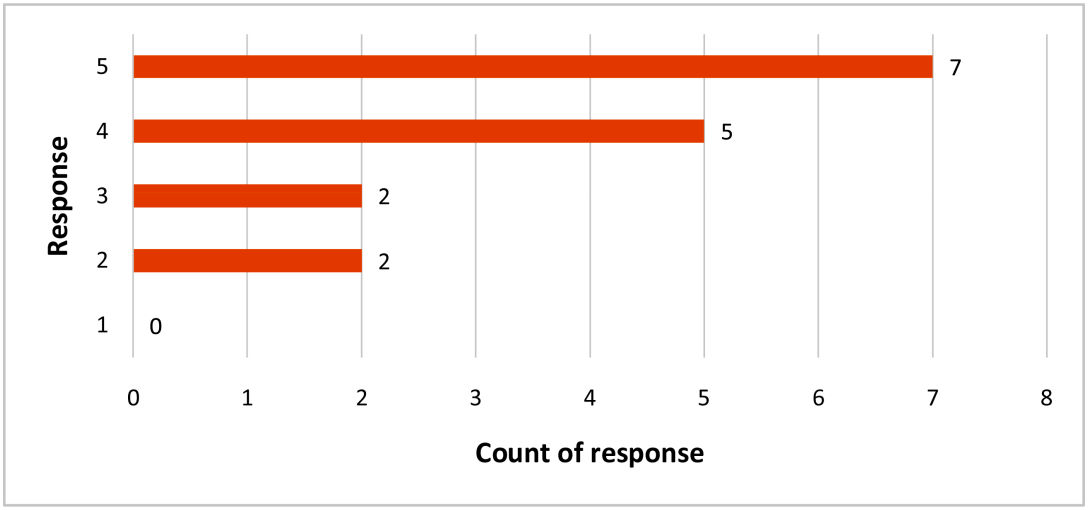

Figure 10. Response to Q4—group 2 second cohort of the second stage survey.

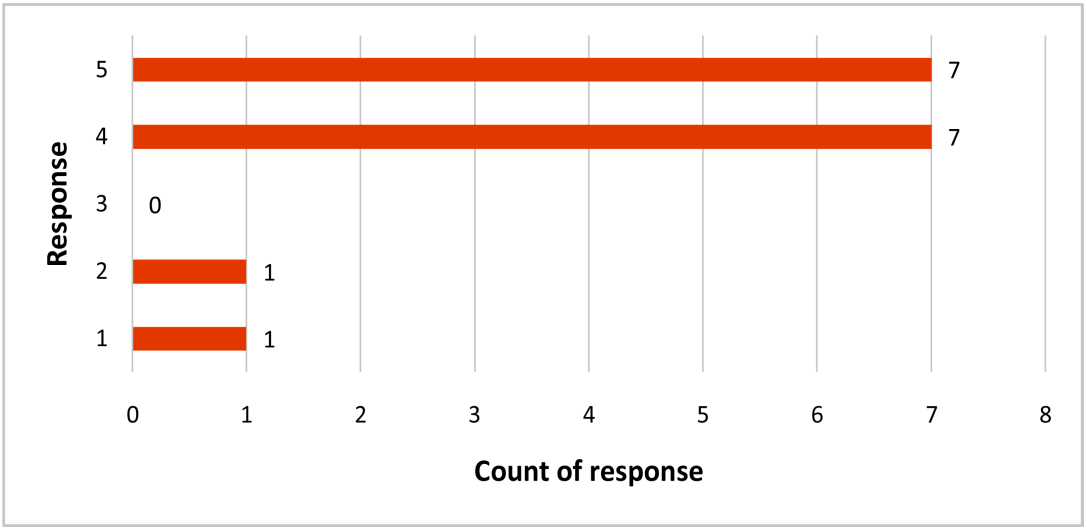

Figure 11. Response to Q5—group 2 second cohort of the second stage survey.

Finally, for the question Q5, 43.75% respondents strongly agreed, 43.75% agreed, 0% neutral, 6.25% disagreed and 6.25% were strongly disagreed about the module study workload. The total score of 76.8% students agreed clearly indicates enhanced student satisfaction and improvement in the module content and delivery.

4. Discussion and Results

Apart from focused interviews and comprehensive discussions with senior academic leaders for establishing teaching and learning goals, leaning through reflective practices, and evaluating student feedback, this project has conducted a descriptive survey designed under a qualitative mixed approach. An aerodynamics module was used as a representative study topic for the survey. The design identifies the problems and seeks solutions. This kind of design shows traits of a population or occurrences being explored offers solution, but it does not provide an exact answer, generally (Bhasin, 2019). The surveys were carried out on five different undergraduate aerospace engineering student cohorts in two stages at a university in China.

Results from the first stage survey show that the students were not strongly engaged or challenged by the module content and teaching delivery. According to the survey only 72.5% students were satisfied with the surveyed teaching module. That translates into low student satisfaction for the module. That means, the students were not satisfied with some or all the elements of the module, such as the module organisation, subject content, and delivery of the module. Thus, as a corrective measure, the assessment weightage of the module was changed based on the student feedback and leadership input. Additionally, many reflective exercises to study the influence of leadership input were carried out and the outcomes were used to improve the content and delivery of the module. A literature review was initially conducted to gather information about key components related to improvement of generic STEM modules and corelations between research and teaching quality.

The second stage survey was done as a follow up exercise after implementing the changes. This stage was more comprehensive to carry out a more profound analysis. So, it was divided into two different cohorts and the results were recorded separately for each cohort. Furthermore, response to individual questions were also analysed to gain deep understanding of the outcomes. The results indicate a progressive improvement in student satisfaction rate with 75% and 76.8% from the first and second cohort are satisfied with the module elements, respectively. This is much higher than the original satisfaction score of 72.5%, originally obtained from the first stage survey. There were not many subjective comments or feedback provided by the students though. Similarly, the survey return rate was also not high as compared to the return rate of the first stage survey. Nevertheless, the improvement in the student satisfaction rate leads to believe that the reflective exercises under the supervision of relevant academic

leadership not only help in enhancing teaching and learning quality of an academic, but they can also be adopted as a tool to engage students in learning activities.

According to Göker and Bozkus (2017), effective leaders reflect on their past experiences and search for relevant, different insights before the decision-making process. Therefore, leadership inputs and interventions play an important role in reflective learning in higher education context. Consequently, the learning through reflection can significantly be influenced by a series of self-assessments and leadership inputs. Investigation of various types of academic leadership styles demonstrates that the implementation of transformational leadership would provide a superior opportunity to develop an academic unit or institution by keeping all academics motivated. On the contrary, a top-down approach may lead to staff being daunted, because it reduces opportunities to implement contemporary academic practices at the unit. Likewise, the distributed leadership is also suitable, because it provides staff an opportunity to contribute to the development of the organisation. However, the compensation management was found to be the principal component that influences performance of employees in an organisation (Ombego & Makori, 2015). For example, Bo (2013) believes that there are many reasons for academics leaving job, but remuneration and trust in their leaders are the foremost factors in China. One of the key challenges is the transition from instructional leadership to transformational leadership though, this study has observed.

Various inputs from the leadership were sought during the reflective practices on planning, strategic vision, building consensus for curriculum changes, development of laboratories, and module teaching delivery methods. These are suggested as successful educational leadership traits in higher education by Bryman (2007). Additionally, the leadership intervention for improving student learning outcomes and employability, guidance on establishing research partnerships, preparing course accreditation documentation and assessment modifications was also considered during this project. Essentially, the development of the research partnership initiative required the use of several different leadership traits, which are beyond the scope of this study. As a part of the supervised reflection, regular discussions with an academic mentor on establishing best practices, project management and conflict management were also done in view of learning interdisciplinary skills. Although whether the skills would add any value in improving teaching quality was not investigated. Nevertheless, the discussions revealed that academic leadership qualities required in East Asia can be different than those exist in other part of the world.

Similarly, the leadership inputs about curriculum development have also yielded interesting insights. For example, students in East Asia are not very vocal about issues with module content or curriculum. However, they do provide useful feedback through the anonymous survey. Therefore, it can be established that the feedback should be considered when a curriculum is being updated to ensure

that students get the best learning experience possible. The reflective exercises also brought the issues of module deficiencies, declining student engagement, and dependence of students on their lecturer for developing the structure of their learning.

5. Conclusion

Higher education sector is under survival pressures currently due to automation and self-learning online students in addition to dynamic industry expectations. This demands a significant innovation and overhaul of current teaching and learning processes. Thus, this study has introduced an innovative suggestion to change the current individualistic style of reflective learning practice to a leadership-supervised reflective learning for an academic to improve teaching quality and student satisfaction. Primary objective of this project therefore was to examine the effects of the supervision on teaching effectiveness of an academic and on student satisfaction because of the proposed style of reflective practices. Therefore, the paper discusses the outcomes of the reflective exercises and how they are influenced by leadership input or interventions in a higher education context.

To examine the effects of the proposed practice on student satisfaction as a result of teaching quality, a student satisfaction survey was done in two stages on five different student cohorts at a university in China. The first stage included three cohorts and remaining two cohorts comprised the second stage. An aerodynamics module of undergraduate aerospace engineering degree was selected for this research. Peer observations were done for quality assurance purpose and focused interviews were conducted to evaluate the influence of academic leadership input. Results from the first stage survey show declining trend of student satisfaction. This was considered as a weakness module delivery quality. The trend instigated the course management leaders to modify the module content and review delivery methods in addition to redesigning the module assessment structure. Accordingly, module was modified. For example, the module assessment components were changed from examination-heavy to laboratory assessments and coursework after receiving input from the supervising academic leadership. Subsequently, the second stage survey was done to test the effect of the changes. As expected, both cohorts indicated an improvement in student satisfaction.

To ensure validity of the supervision, the study has investigated the different leadership styles to identify a suitable one for the task. Based on the analysis presented in this paper, the distributed and transformational and leadership styles would not only allow the opportunity to act upon student feedback in a quick and decisive manner, but also facilitate to design the courses more inclusive. The study has found that transition from instructional leadership to transformational leadership can be a challenge though in certain cultures. Finally, it can be concluded that the leadership-supervised reflective learning practices are

instrumental in adding value to teaching quality and student satisfaction. This also assists an academic in developing his or her academic career like standard peer review assisted reflective learning practices.

Future Research

This research has been carried out at only one university and primarily the practices and data were focused on junior academics. Therefore, it will be interesting to observe if more senior academics are involved and a larger quantity of the data are collected from many universities. This may further validate the observations and results of this study, the authors believe.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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