

Cultivating Student Leadership in the Flipped Classroom

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ABSTRACT

This paper outlines the design and implementation of an educational approach to cultivate student leadership in a flipped classroom by facilitating a positive learning relationship between the learner and the facilitator through shared leadership and flexible assessments. The aim is to enable learners to abandon the notion of the teacher being the ‘sage on the stage’ and adapt to learning accomplished through interaction. Such an environment enables learners to actively contribute towards their success by taking ownership of their learning. The paper describes the findings of a learner-centred educational approach implemented for an IT Mathematics module run in the flipped classroom model. Student performance over five consecutive occurrences of the module was compared – the first three were prior to implementing the said approach; and the last two implemented the student leadership approach. Early qualitative and quantitative results of the student leadership approach indicate improved student performance and student satisfaction. Students have requested that this model be implemented in more modules.

Keywords: Student leadership, Flipped classroom, Student engagement, Shared leadership, Flexible assessments

1. INTRODUCTION

With the diversity in student population, comes the need for tertiary institutes to adapt educational approaches that provide every student, a seamless and relaxed learning experience that promotes authentic learning. The flipped classroom is one of the popular methods adopted by tertiary institutes to involve learners in active learning strategies. The flipped classroom methodology is a type of blended learning, whereby learners are presented course material in advance, so they can be prepared for the classroom sessions. Research indicates that flipped classroom model helps learners learn at their own pace, spend more time in preparatory work, and get more involved during classroom activities (Kong, 2014). The flexibility in learning options should not be restricted only to the learning methods but should also extend to the choices the learner has in the way they are assessed (Wanner & Palmer, 2015). With the shift from the tutor being the *sage on the stage* to *guide on the side*, it is necessary to support learners with the shift in their role from being passive recipients to being interactive learners. This paper presents the design and findings of implementing shared leadership and flexible assessments and how it helped cultivate student leadership in the flipped classroom.

The student leadership approach was implemented for an Information Technology (IT) Mathematics module of the three-year computing degree. A quantitative analysis of student performance was conducted over five consecutive semesters – the first three occurrences, semester 1 2017 (2017_01), semester 2 2017 (2017_02), and semester 1 2018 (2018_01) as a flipped classroom; and the last two occurrences – semester 2 2018 (2018_02) and semester 1 2019 (2019_01) as a flipped classroom with the student leadership approach. Qualitative analysis was performed in 2018_02 and 2019_01.

The rest of the paper is organised as follows: Section 2 gives the background and motivation to boost student participation in the flipped classroom model. Section 3 explain the research design. Section 4 gives details of the design and development of an approach to cultivate student leadership. Section 5 reports on the implementation and verification of the said approach for

an IT Mathematics module. Section 6 analyses the results of the implementation in terms of student participation, student achievement, and student satisfaction. Section 7 concludes by discussing the benefits and shortfalls of this approach and its usability. Recommendations are made for further developments.

2. BACKGROUND AND MOTIVATION

The success of any educational approach is when the students feel excited and safe to engage in their learning activities. It is important to understand what motivates students and how students learn in order to decide which ways of teaching and assessing will be most effective (Biggs, 2011).

The problem: The major concerns that educators have when teaching in the flipped classroom model are – getting *all* learners to do the required preparatory work before of the classroom session; getting *all* learners to actively participate and engage in the classroom activities; and getting *all* learners to achieve as well as they are expected to in their assessments.

Literature review: The flipped classroom model relies on learners doing the pre-session tasks prior to the classroom session. The principle is that learners will have more time to process and reflect on concepts before coming to class to apply their learning. However, many learners perceive it to be difficult to learn new topics on their own without the guidance and encouragement from a knowledgeable person (Vygotsky, 1978). Bledsoe believes that learners often take on multiple jobs, have family challenges, and have other stress factors that keep them from preparing for a class (Bledsoe & Baskin, 2015). Educators must not consider a flipped classroom simply in terms of delivery and the use of technology but should also understand what motivates learners and how the planned activities support learners’ demands (Thai, Waver, & Valcke, 2017). It’s not the instructions and videos on their own, but how they are integrated into an overall approach, that makes the difference (Tucker, 2012).

Learning is more effective when learners encourage and help each other, give each other feedback, challenge each other’s conclusions and reasoning, and take the perspectives of others to explore different points of view. Sadly, the lack of students’ willingness to engage in discussions, putting forward their understanding and offering comments, is a widespread problem (Herrmann, 2013). It is crucial that learners understand why

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they are participating in a collaborative activity instead of working on their own. If they do, then the groups' motivation to work together, solve group-tensions, and deal effectively with non-participating members will be strong (University of Waterloo, n.d.).

Wiggins believes that good learning sources and hard work are necessary but not enough – mastery requires iterative and purposeful performance by students who are given clear performance targets, coaching, good feedback, and many opportunities to make incremental progress towards success (Wiggins, 1998; Simms et al., 2017). To improve learning and to avoid nasty surprises at the end, students need to receive appropriate and focused feedback early and regularly (Angelo & Cross, 2012). Learners are overly fearful of assessments due to the perceived threat of failure. Assessment as learning occurs when learners are their own assessors and can reflect on their learning. Ongoing assessments with useful feedback that help learners to self-reflect and self-adjust will radically transform their learning experience. Assessments should be designed to promote learning and improve performance, not merely to audit it (Wiggins, 1998; Yu et al., 2006).

Educators should enable learners take ownership of their learning and help learners become more aware of their learning process and prepare them better for success.

3. RESEARCH DESIGN

The research design was based on participatory research and classroom action research. The cyclic nature of action, reflecting on the action, and then acting again based on what we have found becomes a cycle of action-reflection (McNiff, 2009). The research design for the approach followed an action research cycle as follows:

Phase 1: The problem was identified – getting all learners to prepare, to participate, and to succeed in the flipped classroom model and have an enriching learning experience.

Phase 2: A brief literature review was conducted for the problem identified.

Phase 3: The requirements of a learning approach to cultivate student leadership were identified, and design tenets were developed.

Phase 4: The design tenets of the new approach were presented to a forum of peers for verification.

Phase 5: The approach was implemented for the first time in semester 2 2018 (2018_02). The results of the implementation were analysed and verified by a second forum of peers.

Phase 6: The approach was implemented for a second time in semester 1 2019 (2019_01) with some minor changes. The results of this implementation were analysed, and comparison was made over the five consecutive occurrences of the module.

Phase 7: Based on the analysis, conclusions were drawn, and recommendations are made for future implementations.

So far two iterations of this approach have been implemented.

4. DESIGN AND DEVELOPMENT OF THE APPROACH

This section describes the requirements that were identified to facilitate a positive learning relationship between the teacher and the learner to boost student participation. This is followed by the design tenets of an approach to cultivate student leadership.

4.1 Requirements

The purpose for creating and adopting an approach to cultivate student leadership is to enable students to actively engage in their learning, especially in the flipped classroom model. Careful planning is essential. Vygotsky proposed that to ensure

that every learner achieves success education providers should focus on three important factors (Vygotsky, 1978):

- The presence of someone with the knowledge and skills beyond that of the learner (the more knowledgeable)
- Social interaction with a skilful tutor that allows the learner to observe and practice their skill
- Scaffolding (supportive activities) provided by the tutor, or more competent peer to support the learner as they are led into their zone of proximal development (ZPD).

The key factors that were considered when establishing a student leadership approach include: student engagement; student assessment; student achievement; and student satisfaction.

4.2 Design of the approach

In order to address the key factors mentioned above, as well as those proposed by Vygotsky (1978), three main concepts were finalised as the design tenets to cultivate student leadership. These are explained in detail below.

4.2.1 Student-centred content

Learner will be excited and wanting to prepare ahead for a class if they recognise the value of the material and have some form of satisfaction with the learning activity (Conti, 2009). Learners must have access to a variety of suitable, relatable, and reliable resources.

- Provide relevant learning content in the form of activities that learners perform on their own to achieve specific outcomes while also learning through this experience – their yearning to learn is the overarching need of the day (Tucker, 2012).
- Generate content for learners in several forms, for example, short video lessons by the tutor, video links to other sites, course material by tutor, links to readings, online discussion forums etc. (Rashid & Asghar, 2016).
- Include plentiful web-based review quizzes and provide individualised feedback based on learner's response at each step. With the use of such on-going self-assessment they can progressively improve their understanding and performance in the application of the content.

Having quality self-directed learning resources will enable learners to have a greater level of direct engagement in their learning and will enable them to participate in a community of learners resulting in increased accomplishment of learning (Rashid & Asghar, 2016). Empower learners to be their own teachers and direct their learning process.

4.2.2 Student-centred sessions

Students need to master critical thinking skills for their success in learning. The flipped classroom could be supported with non-technology related classroom learning – Teachers' interaction with learners during the classroom session can be more personalised and less instructive while students actively involved in the learning (Tucker, 2012).

- Ask how you can help them do better in the course. Small changes create a virtuous cycle. As learners see their ideas being implemented, they will be willing to offer more ideas. Respecting their ideas will encourage learners to bring more of themselves to the class (Washington University, 2009).
- Explore learners' previous experience and learning. Encourage their involvement with one another. Get peers to discuss solutions, and ways to improve the solution if possible (Starkey, 2017).
- Create a nurturing environment for the learners so they can freely ask questions. Don't be hyper-corrective – critique the ideas; don't criticise the person (Washington University, 2009).

- Use learner-centred activities (e.g., small groups) and provide multiple means of student engagement (Bledsoe & Baskin, 2015).
- Learning by teaching is a very effective way to understand the underlying concepts and to retain knowledge. Embolden learners to teach their peers – in pairs, in groups, and/or to the whole class. Peer instructions can be powerful.

Talk with learners about their challenges. Discussing ways to manage them may help learners feel more involved in the course and be more persistent to succeed (Bledsoe & Baskin, 2015). The aim is to increase student ownership, so they feel excited to think for themselves and try out their own ideas. It is important to respect learners' preference of learning styles – not all learners will like the interactive nature of the classroom. Some may even be solitary learners – allow for solitary learners to have their space while encouraging engagement.

4.2.3 Student-centred assessments

Learning should be assessed throughout the semester, so learners can evaluate their learning early and tutors can reflect on their teaching strategies (Stanford University, n.d.). When learners personally monitor their learning, they can reflect on it and can make changes or adjustments in what they understand (Earl, 2012). Give learners choice of the type of assessment (how), the timing of assessment (when) within the set deadlines, and the quantity of assessment (how much) they choose to attempt while ensuring that the assessment integrity is maintained and the learning outcomes for the course are achieved.

- Assess learners and provide feedback on a continuous basis. Oftentimes there is a gap between what was taught and what has been learned. If this is not rectified early on, it may be too late to remedy the situation (Stanford University, n.d.).
- Allow learners to take ownership of their assessments. Let them decide when they feel confident and are ready to be assessed. Learners can work at their own pace to master the topic before being assessed
- Give learners the option on the ways they want to be assessed in order to prove that they have met the required standards.

In the initial runs of the implementation, it may be helpful to guide the learners by giving them a guideline or options on tasks that they can choose to attempt early.

5. IMPLEMENTATION AND VERIFICATION

To cultivate student leadership, shared leadership was implemented in conjunction with flexible assessments for a level-6 IT Mathematics module for two consecutive occurrences – 2018_02 and 2019_01.

As with any new approach being developed and implemented, both the teacher and the learner must be willing to experiment with alternative strategies in the classroom. At the start of the semester, learners were given a clear idea of the structure of the flipped classroom – the expectations of what the learner would be doing; the content that would be available on Moodle; the time they would need to invest before the class; and why it was necessary for them to be prepared for the class. This information was also made available in a document on Moodle.

5.1 Student-centred content

The module consists of ten topics (details in Table 1). Web-based content for the module was provided on Moodle and each topic was presented on a separate page. The format and content for each topic was consistent and comprised of pre-session study, workshop activity, and post-session study.

Pre-session study included a Moodle Lesson and a Web-based *review quiz*. The Moodle Lesson (like a workbook) comprised of simple text-based instructions, short 1–2-minute tutor videos and mini quizzes for almost all pages of the lesson. All the web-based quizzes provided instant feedback giving learners immediate affirmation of their understanding. Upon completion of the Moodle Lesson, learners could attempt the *review quiz* which consolidated the content from the Moodle Lesson. In this way, ample opportunities for immediate feedback were offered, almost in ways typical of traditional classrooms, while students were working on their own. There was no restriction on the number of attempts for these quizzes as they were designed to be formative.

Workshop activity included tasks that complemented the *review quiz* and was paper based. Learners had to attempt these tasks and present it to the class during the classroom session where peers could discuss the topic and the solution.

Post-session study had links to resources on other websites like videos, reading material etc. that learners could access for further guidance to understand the topic.

The ten topics relate to the ten topic-tests. Being able to learn and master the topic and having the choice to attempt the assessment early was one of the main motivations for learners to attempt the pre-session work beforehand.

5.2 Student-centred sessions

It was expected that the learners studied and attempted the web-based quizzes in advance before the classroom session.

- The learning tasks and activities for the session were handed over to learners who prepared and completed them. A safe environment was created where all learners were willing to share and explain their solution.
- Peer instruction was a key component. Learners volunteered to peer-teach parts of the topic that they just mastered to their peers' in class. The "peer teacher" would then proceed to assess their peers understanding by asking question and getting them to solve problems.
- Learners' actions were orchestrated and synchronised so that everyone moved forward on the same timeline.
- Iterative problem-solving would occur, with repetition and variation. This encouraged shared, interactive meaning-making.

This was very compelling as learners saw their peers mastering the topic and it inspired them to actively involve and eventually peer-teach the class. As a tutor, I would validate or clarify the content the *peer tutor* presented to the class.

In the initial few weeks it was observed that some of the learners were reluctant to participate either because they found it daunting or because they just didn't want to. Some of the steps that helped with overcoming this were:

- Not being forceful – Encouraging them to work with a buddy of their choice; allowing them to bring the buddy along for presenting or sharing the work with the class helped ease their reservations.
- Not being critical – By allowing learners to make mistakes in a safe environment, I reinforced to them that it was okay and acceptable to make mistakes.
- Being consistent – Being consistent with the class structure and insisting that pre-session activities be completed helped with learners continuing to work as scheduled – especially for sessions after a statutory holiday or the term break.

It was observed that by the end of week 2, most of the learners were actively participating. Sometimes one or two learners didn't participate in the session because they had other things

going on in their lives or were having a bad day. However, this was not a regular occurrence.

Many learners reflected that by instructing others, it reinforced their own learning and that teaching a topic helped them fully understand the topic. My role as a teacher shifted – I was interacting with learners as a mentor. Time to time, I would validate or clarify the content of the session, now run by the learners.

5.3 Student-centred assessment

Assessments were implemented with partial flexibility. At the start of the semester learners were informed of the assessment structure and the flexibility incorporated. A document detailing the topic-tests, the deadlines for each topic-test, the contribution of each topic-test towards the course, and their options if they missed a test etc. was available to learners on Moodle for their reference. Flexible assessments were implemented as explained below:

- Choice of “How”: The original assessment structure for the course had four supervised tests. Tests are suitable to assess math content.
- Choice of “How much”: Each test was broken down into smaller parts as topic-tests. The “4 test model” was used as a guideline to determine the deadline before which each topic-test had to be attempted. Table 1 below, shows each test broken down as topic-tests, its contribution towards the course, and the deadline.

Table 1: Assessment structure - previous model and the new model

Previous model	New model (as Topic-tests)	Deadline
Test 1 (20%) Logic	1. Propositions (7.5%)	Week 4
	2. Predicates (12.5%)	
Test 2 (30%) Sets and Functions	3. Set Theory (7.5%)	Week 8
	4. Functions (12.5%)	
	5. Matrix (10%)	
Test 3 (20%) Combinatorics	6. Counting (10%)	Week 12
	7. Permutations & Combinations (10%)	
Test 4 (30%) Probability and Statistics	8. Probability (15%)	Week 16
	9. Binomial probability (BP) (6%)	
	10. Cumulative BP & Deviation (9%)	

- Choice of “When”: There was a deadline (details in Table 1) before which learners had to attempt the topic-tests. Learners were expected to attempt all the topic-tests that belonged to a test, on or before the deadline. The original deadline of the tests determined the deadline for the topic-tests.

To maintain the integrity of the assessments the following measures were taken:

- Web-based mock tests were available, which in addition to being a revision tool also helped prevent learners to ask those that had attempted the test early to reveal questions from the test.
- Multiple versions of the topic-tests were created so no two runs had the same questions.

To ensure that learners were not peer-pressured to attempt the assessment early, they were encouraged to score at least 90% in the web-based mock test to attempt the topic-test early.

5.4 Verification

In terms of verification, and as part of our reflective practice at Wintec, the approach was outlined and presented to a forum of peers. Some of the encouraging feedback are as follows:

- *Having a consistent format on Moodle is useful as students will know exactly what content they can expect for each topic.*
- *Your idea of self-created videos, though technologically outdated, is useful to replicate the traditional ‘tutor passing information to student’ model and will add a personal touch.*
- *There appears to be plenty of quizzes for students to attempt on their own. This is a good simulation of a classroom where students answer questions and get affirmation.*
- *It is excellent idea to have the mock test available to students’ and having different versions of the test to use. This way there wouldn’t be the inkling to ask students to pass-on the questions from the test.*
- *Videos are good. Students can pause, review, and restart the video.*

It was acknowledged that while it sounded an easy enough thing to do, this model was heavily reliant on students’ willingness to prepare ahead and participate in class.

Upon completion of the first implementation of this model in 2018_02 the findings and analysis were presented to a forum of peers from another Centre. The feedback received from them was positive. Some of the feedback was as follows:

- *Great. I have taken a lot from this.*
- *Flexibility, encouragement amongst students/peers, self-paced, sharing of different strategies by students. Very interesting.*
- *It allows all students to engage by providing an informal class environment.*
- *The tutor is present to ensure information is accurate and to provide support.*
- *I like the confidence it gives students in the subject.*
- *I love the way that students take ownership which fosters buy-in and real learning.*

These comments were motivating, and it validated that the approach *did* manage to get learners more engaged and involved. Having this affirmation was useful before it was implemented for a second time in 2019_01.

To get a better insight on the learning occurring in the classroom, I requested for a peer observation by our *Literacy and Numeracy Manager*. His observation report was based on the observations made in the classroom; and the informal discussions he had with the learners in my absence. Some of the comments from his observation report are listed below:

- *The interactional strategies used in the session were already well established by the time the observation was made. The rights and responsibilities of individuals in this flipped learning context were well established, especially co-responsibility and optimal engagement.*
- *The willingness of learners to participate in the interaction and their commitment to learning were evident from the session, confirming that high-trust relationships had been established and maintained by the tutor.*
- *An introverted student was accommodated, with the tutor allowing him to work on his own and asking for assistance if and when required.*
- *Sunitha’s approach showed how the principle of socially distributed cognition and support could be implemented, specifically how interaction among various participants could be mobilised to support learning.*

The observer provided hyperlinks to explore existing literature on similar approaches. This was reassuring.

6. ANALYSIS OF RESULTS FROM IMPLEMENTATION

The analysis presented here are from the implementation in 2018_02 and 2019_01. These were analysed for student participation; student achievement; and student satisfaction.

6.1 Student participation

Learners were able to adapt to an interactive learning environment. It was observed that learners actively engaged in the classroom activities and took ownership of their learning and assessments. Some of the obvious benefits of this approach that were observed are:

- Making the course self-paced allowed more time to be spent with students needing extra help. Advanced learners had more freedom to learn independently.
- Engaging learners on a continuous basis enabled them to work throughout the semester. Learners provided informal feedback that this reduced the situation for overload and excessive mental stress as compared to the traditional “single-shot” effort close to assessments’ deadlines.
- It was observed that advanced students directed the struggling students. Learners often commented that by instructing other students, their own learning was reinforced.
- Even the struggling students could experience success. It was observed that success gave them confidence and helped overcome the fear of failure and improved student satisfaction. This was evident from the student results and their feedback.
- By having the choice to attempt the assessment immediately after learning the topic, learners were motivated to work on the pre-session tasks. This was evident from the log for the online activities. They were keen to demonstrate their understanding and it was observed that they willingly participated in the classroom activities.
- By having the choice to choose when they did their assessments, they attempted the test only when they were confident that they understood the topic. This resulted in better performance in the tests and better grades – evident through improved grade distribution and pass rates.

Some aspects that helped ensure student engagement were – not being forceful; not being critical; and being consistent. Some learners were motivated to engage because they had the choice of attempting the assessment early.

As indicated in Table 1, learners had deadlines before which they had to complete their topic-tests. There were 28 learners enrolled on this occurrence of the course. Table 2 below shows the weeks in which the topic-tests for Test 1 had to be attempted and the number of learners that chose to attempt it.

Table 2: Number of students attempting Test 1

Test 1	Week 1	Week 2	Week 3	Week 4
Topic 1	-	7	9	12
Topic 2	-	1	9	18

Learners had the choice to attempt Test 1 (Topic-1 & Topic-2) in week2, week3 or week4. Most of the learners chose to wait till the deadline to attempt the topic-tests. Learners could attempt Test 2 (Topic-3, Topic-4 & Topic-5) between week5 and week8, as shown in Table 3. More learners chose to attempt the topic-tests early and only one of the learner chose

to accumulate and attempt all the three topic-tests on the deadline.

Table 3: Number of students attempting Test 2

Test 2	Week 5	Week 6	Week 7	Week 8
Topic 3	21	5	1	1
Topic 4	8	7	10	3
Topic 5	0	6	12	10

From Table 4 below, we can see that learners could attempt Test 3 (Topic-6 & Topic-7) between week10 and week12. None of them chose to attempt the two topic-tests together on the deadline.

Table 4: Number of students attempting Test 3

Test 3	Week 9	Week 10	Week 11	Week 12
Topic 6	-	14	14	0
Topic 7	-	9	14	5

As shown in Table 5, learners had the choice to attempt Test 4 (Topic-8, Topic-9 & Topic-10) between week13 and week16. All learners chose to attempt at least one of the three topic-tests ahead of the deadline.

Table 5: Number of students attempting Test 4

Test 4	Week 13	Week 14	Week 15	Week 16
Topic 8	20	8	0	0
Topic 9	0	17	10	1
Topic 10	0	0	21	8

Learners were initially reluctant to attempt the topic-tests early. As they became familiar with the idea and/or the benefits of attempting the assessment early, more learners chose to attempt the assessment before the deadline. Very few learners chose to attempt all the topic-tests for a test on the deadline. This model also supports learners that do not want to attempt assessments early and preferred to accumulate the understanding of the whole topic before being assessed.

6.2 Student achievement

The class test results were compared for five consecutive occurrences of the course. In order to have a fair comparison of performance across semesters, the same assessment was used for 2018_01, 2018_02, and 2019_01. In 2017_01, 2017_02 and 2018_01, the tests were run as Test1, Test2, Test3, and Test4. In 2018_02 and 2019_01 flexible assessments was implemented (i.e. run as topic-tests).

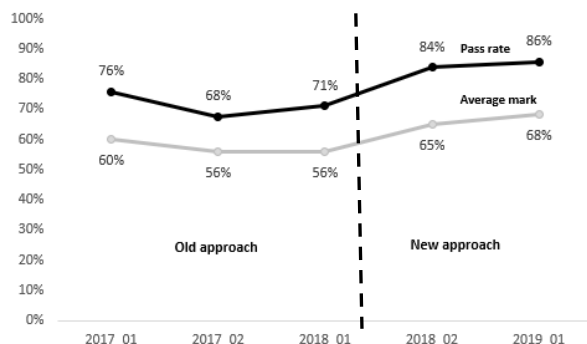


Figure 1: Pass rates and average mark for five consecutive occurrences of the course

Figure 1 above, gives a graphical representation of the pass rates and the average mark for the five consecutive occurrences of the course. We can see that the pass rate improved since the new approach was implemented in 2018_02. Also, we can see an improvement in the class average for the course with the new approach.

To gain a better understanding of student performance, the distribution of student grades for the five occurrences was analysed. Figure 2 below, shows the percentage of students achieving each grade for 2017_01, 2017_02, and 2018_01 (prior to the student leadership approach).

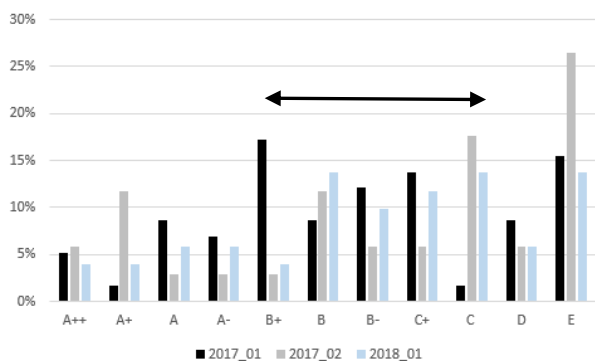


Figure 2: Distribution of grades under the old approach

From Figure 2, we can see that in 2017_01, most of the students were in the C+ to B+ grade range and the average mark was 60. In 2017_02, most of the students were in the C to B grade range with the average mark being 56. In 2018_01, most of the students were in the C to B grade range. The average mark was 56. Across the three semesters, the pass rate was 72% and the average mark was 57%.

Figure 3 below, shows the percentage of students achieving each grade for 2018_02 and 2019_01 (with the student leadership approach).

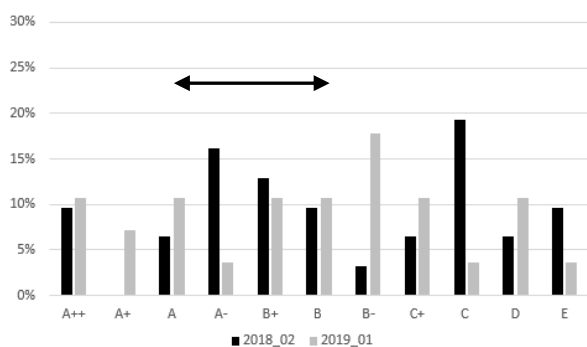


Figure 3: Distribution of grades under the new approach

From Figure 3, we can see that in 2018_02 most of the students were in the B+ to A grade range and the average mark was 65. In 2019_01 again most of the students are in the B to A grade range and the average mark was 68. Across the two semesters, the pass rate was 85% and the average mark was 67%. The performance was visibly better with the new approach.

This shows that by giving students' flexibility with time and responsibility for their learning, they took ownership of their performance. Learners chose to attempt the test when they were confident with the topic and were ready to be assessed – this helped them achieve better grades.

6.3 Student satisfaction

Towards the end of the semester students were asked to reflect on their learning experience. Anonymous feedback about the

approach was collected from students via Moodle surveys. Quantitative feedback was collected for:

- Satisfaction with the approach (course design)
- Confidence level of their ability to work on the course topics (as self-evaluated by students) at the start and at the end of the semester.

Similarly, qualitative feedback was collected using directed questions:

- Why the approach is working (or not working) for you?
- Why is the assessment structure working (or not working) for you?

These questions allowed students to reflect on their learning experiences. Students' satisfaction levels and feedback was valuable to evaluate this approach.

6.3.1 Students' responses to Satisfaction with the course design

Students' response to Satisfaction with the course design as a quantitative answer using a scale from 1 to 4 (1: is not working for me; 2: is working okay for me; 3: is working well for me; 4: is working really well for me) is shown below in Figure 4.

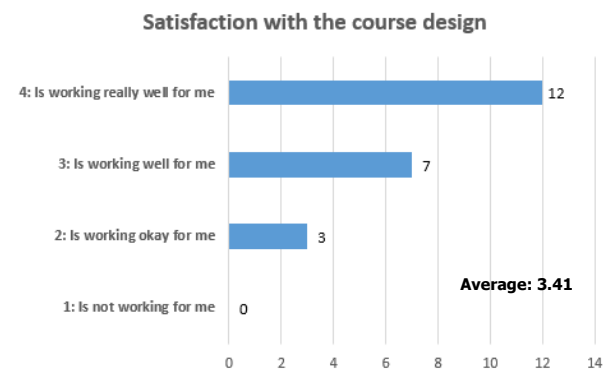


Figure 4: Students' satisfaction with the new course design

22 of the 28 enrolled students responded to the survey at the end of the semester. From Figure 4, we can see that 54.6% of students that responded felt that the course design worked very well for them, 31.8% of students felt that the course design worked well, and 13.6% of students were okay with the course design. All the students that responded felt that this design was working for them and none thought that the course design did not work for them.

Students had positive comments about the active learning strategies implemented. Students' responses to the open-ended questions "Why is the approach working (or not working) for you?" are given below.

- Having short videos was good. Being able to participate in class was useful. Learning was structured well.
- Review quizzes helped check our understanding. We knew if we were on the right track or not.
- The class environment was nice and we were able to collaborate with the class.
- I loved the challenge of coming up with questions for the class to work on.
- It made the class an informal space and more comfortable.
- Made learning joyful, challenging and engaging.
- It is easy to follow and understand this module, even if I miss the lectures it's easy to catch up.
- I really like this class model, it takes the pressure of studying and I feel confident while attempting tests.
- Class collaboration was great. The topics are presented well with many examples and practices to reinforce the learning.

- *The material helps me understand the topic better than my previous institution. I felt like studying before the class because I got to teach it to the class.*
- *We were encouraged to learn from each other rather than look to the tutor for answers. And since my friends relied on me I made sure my thinking was right and I understood the topic better.*
- *It gave us a choice and we could make our own decisions based on our preferences. We knew what we needed to work on.*
- *The classes were wonderfully rewarding, and it improved my performance and my confidence.*
- *I hated studying math before studying from Sunitha after studying from Sunitha I started liking maths.*

It was interesting to note that there was no negative feedback from the learners on the teaching and learning approach used. This can also be observed in Figure 4.

Student responses to the open-ended questions “*Why is the assessment structure working (or not working) for you?*” are given below.

- *I do like being able to learn the content & complete the assessment straight away. It gives me buffer to finish this paper early and allocate more time to other papers.*
- *It was my first time with assessments in flexible timeframe. It allowed to output higher quality work.*
- *It helped me stay focused because I knew that if I learnt the topic well I could attempt the test right away.*
- *The assessments help me understand about each topic.*
- *This made life so much easier. I didn't feel overloaded when I did the test every week.*
- *I like the way Sunitha has organised her flexible assessments. It was handy and easy to prepare for.*
- *Flexible assessments were great. It encouraged us to self-monitor and we could reflect whether or not our study techniques were effective.*
- *Too many assessments.*

There was at least one student that felt that there were too many assessments for this course – possibly because they had the choice to attempt assessments every week. However, as stated earlier, learners did not *have* to attempt topic-tests till the deadline date.

6.3.2 Students' responses to their confidence level

Students' response to their *Confidence level of their ability to work on the topic* as self-evaluated by students from 1 to 10 (1: I don't know anything; 10: I am very confident) at the start of the semester is shown in Figure 5 below and at the end of the semester is shown in Figure 6.

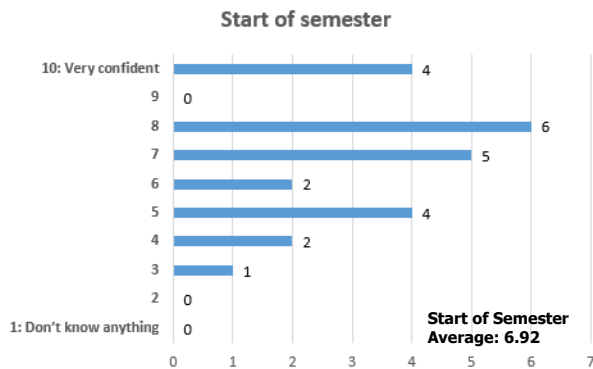


Figure 5: Students' confidence at the start of the semester

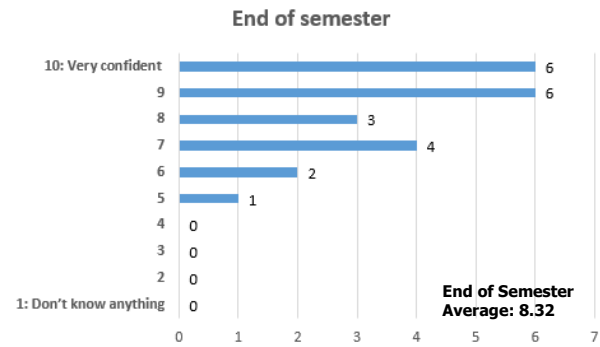


Figure 6: Students' confidence at the end of the semester

24 of the 28 enrolled students responded to the survey at the start of the semester and 22 of the 28 enrolled students responded to the survey at the end of the semester. It was useful to measure students' confidence level at the *start* and at the *end* of the semester. We can see that students genuinely felt that they were more confident with the course topics after experiencing this approach.

6.4 Reflection and Modifications

Upon reflection, it was observed that while the choice to attempt the topic-tests right after learning the topic improved learners focus on the current topic, it created a small pocket of learners that chose to work on the previous topic rather than the current one in the classroom session. When the results of these students were observed, it was not as good as anticipated. For the next occurrence i.e. 2019_02, the assessment structure will be modified so the learner will have a choice to attempt the topic-test either right after the topic session, or on the deadline date, but not in-between.

7. CONCLUSION

This research proposes a shared leadership teaching approach along with flexible assessments to cultivate student leadership. This approach enabled learners to be motivated, actively engaged, and take ownership of their success. The use of this approach led to a lot of rumination as a tutor. On reflection of the teaching techniques, some of the salient impacts identified are mentioned below:

- In terms of student engagement, creating relevant learning content and activities that learners perform on their own, helped them understand the topic and be more willing to work on the tasks. The challenge of interacting with and peer-teaching the class, inspired learners to attempt the required material before the classroom session. The choice of being able to attempt the assessment early motivated them to master the topic.
- In terms of taking ownership of assessments, learners found that they performed better when they understood the concepts and were ready rather than wait for a date in future. Learners were taking ownership of their assessments and were more relaxed when they had flexibility with their assessment compared to the “pressure cooker” traditional assessment.
- In terms of student achievement, 2018_02 and 2019_01 had higher pass rates and average mark when compared to previous occurrences of the course. Overall, there was a shift in student grades through improved performance.
- In terms of student satisfaction, both qualitative and quantitative feedback from students indicated that learners were satisfied with their learning experience. Students have embraced their choice to choose.

Some of the aspects that can be fine tuned to improve the teaching and learning experience are:

- If learners have access to an electronic device, web-based assessments (for example Moodle) can be used. Web-based quizzes allow for randomising questions from a question bank ensuring that a different set is generated every time the test is run.
- If the course outcomes permit, it may be useful to include other types of assessments in addition to supervised tests.

Some of the aspects that teachers need to be aware of and take into consideration in their planning are:

- Learners may not swiftly adjust to the new learning environment. It is essential that the expectations from the learners is clear right from the start and the class structure is consistent throughout the learning period.
- It takes more time to prepare quizzes, mock tests and multiple versions of the assessments; and need more organisational skills to administer the assessments and provide feedback nearly every week.
- The success of this model depends on the learner coming well-prepared and ready to participate in class. Some weeks are busier than other weeks for learners, and teachers need to have alternate activities planned in case learners are not prepared enough.
- Struggling students will still need support and encouragement to engage with the online material.

The results of the two implementations of this approach have been encouraging. Students enjoyed learning in this way and have requested that this model of teaching be implemented in more modules. Currently, this mode of implementation is planned for IT Business Communications (level-6) and Data Modelling and SQL (level-6) modules.

The comprehensiveness of the approach will be strengthened through more implementations, and wider adoption of the approach, in subjects other than those in IT. These will remain as the further course of our research in the future

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