TEACHING MATHEMATICS EFFECTIVELY

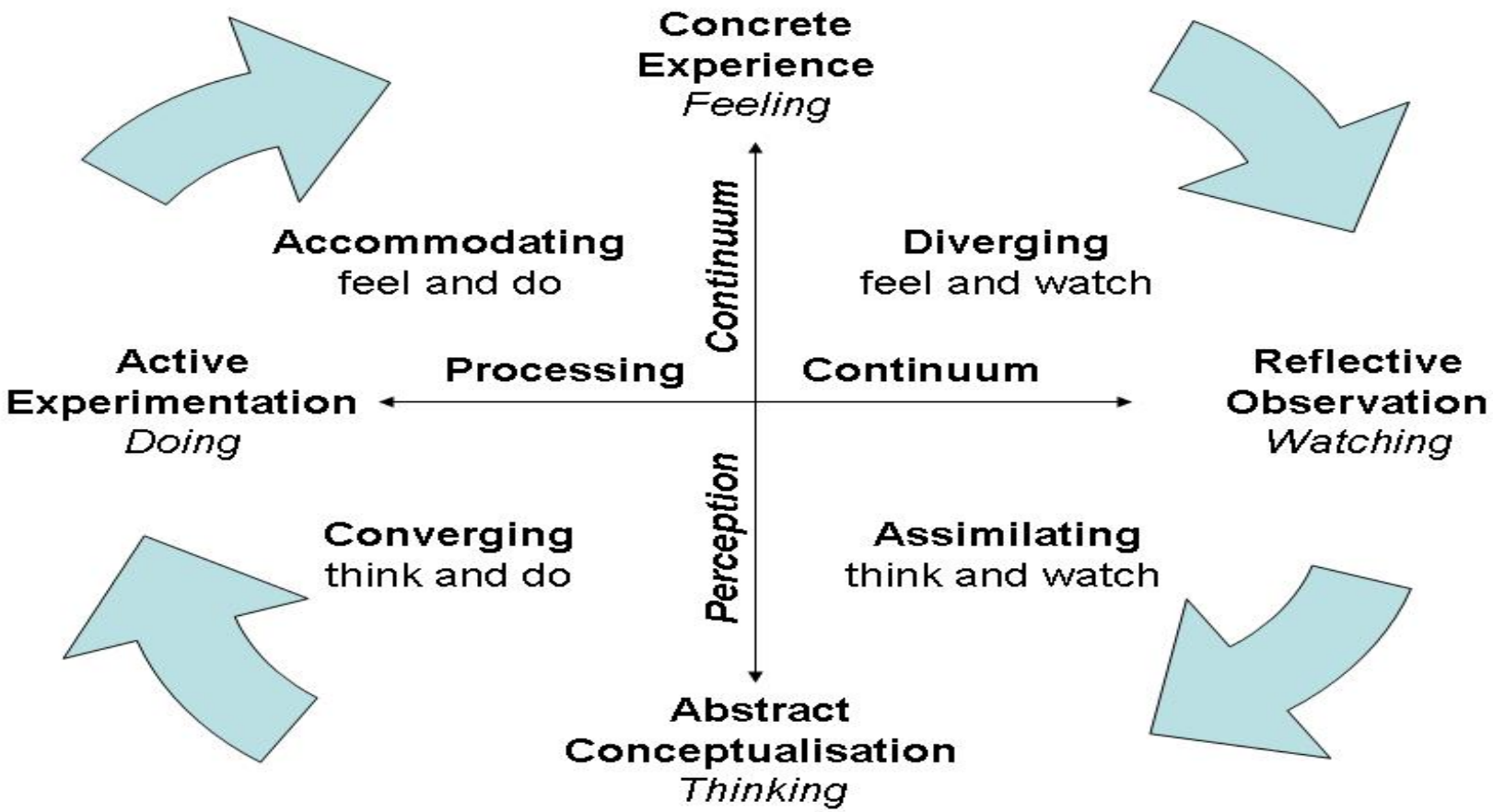
NINA SATER FERNANDES

EXPERIENTIAL LEARNING

- **Kolb (1984): Experiential Learning Theory.**

  "the process whereby knowledge is created through the transformation of experience. Knowledge results from the combinations of grasping and transforming the experience" (Kolb, 1984, p. 41)."

- Dewey (1938) and Bruner (1961): Education with guided experience.
- Piaget (1936): Cognitive development- understanding how children learn.


Concrete
Experience
Feeling
Accommodating
feel and do
Diverging
feel and watch
Continuum
Processing
Continuum
Active
Experimentation
Doing
Reflective
Observation
Watching
Converging
think and do
Assimilating
think and watch
Perception
Abstract
Conceptualisation
Thinking

MY PEDAGOGICAL METHOD

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SAMPLE

- Control class: 21 students (Lecture-based format)
- Experimental class: 25 students (Experientially-influenced format).

RESEARCH QUESTIONS

RQ1. Is there a correlation between applying experiential learning in a first-year mathematics course and retention rate in the class?

RQ2. Is there a correlation between applying experiential learning in a first-year mathematics course and the pass/fail ratio?

RQ3. Is there a correlation between applying experiential learning in a first-year mathematics course and students' course GPA?

RQ4. What are students' perceptions about the experiential learning- influenced and the traditional mathematics classes?

HYPOTHESES

H 1. Students who complete an introductory mathematics course in experiential learning-influenced format would have a higher retention rate as compared to those in the control class.

H 2. Students who complete an introductory mathematics course in experiential learning-influenced format would have a higher pass/fail ratio as compared to those in the control class.

H 3. Students who complete an introductory mathematics course in experiential learning-influenced format would have a higher GPA as compared to those in the control class.

RETENTION RATE DATA

Retention rates were obtained on the 12th week of the semester. Retention rate indicated the percentage of students who did not withdraw by the withdrawal deadline on the 12th week.

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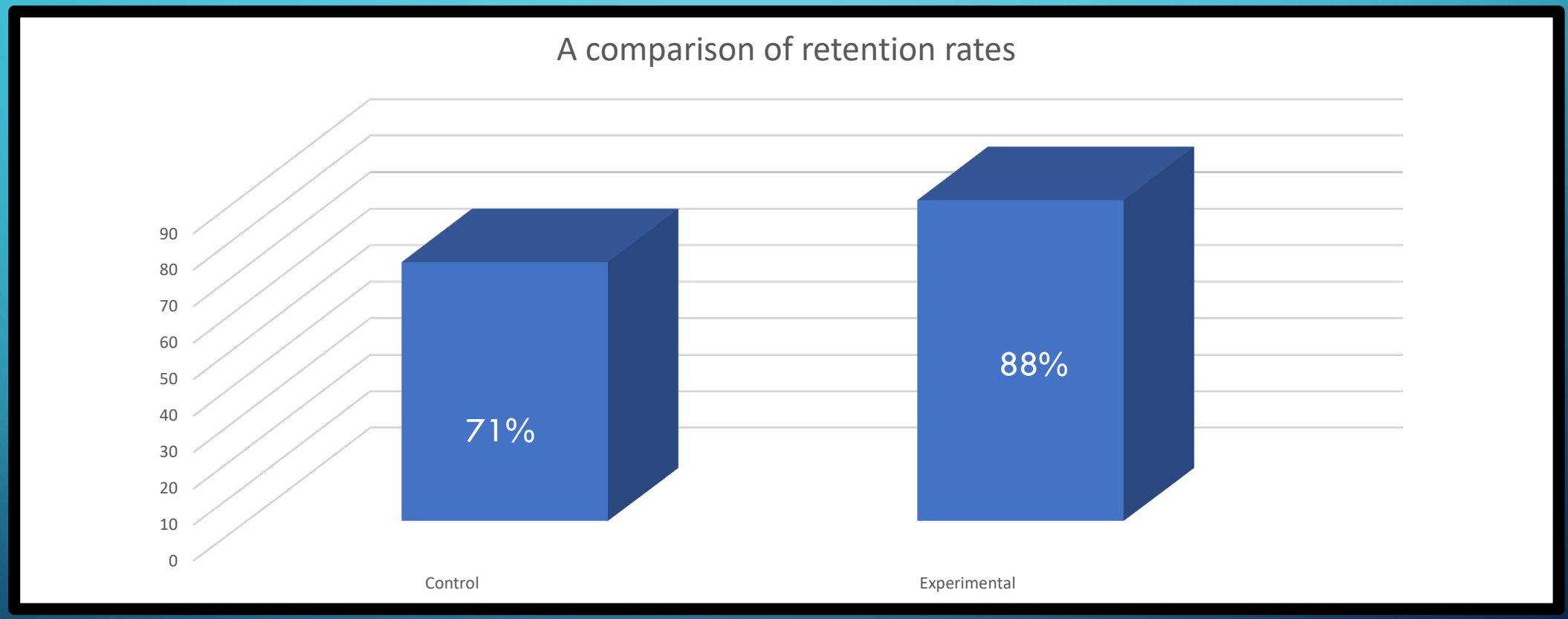
RETENTION RATE GRAPH



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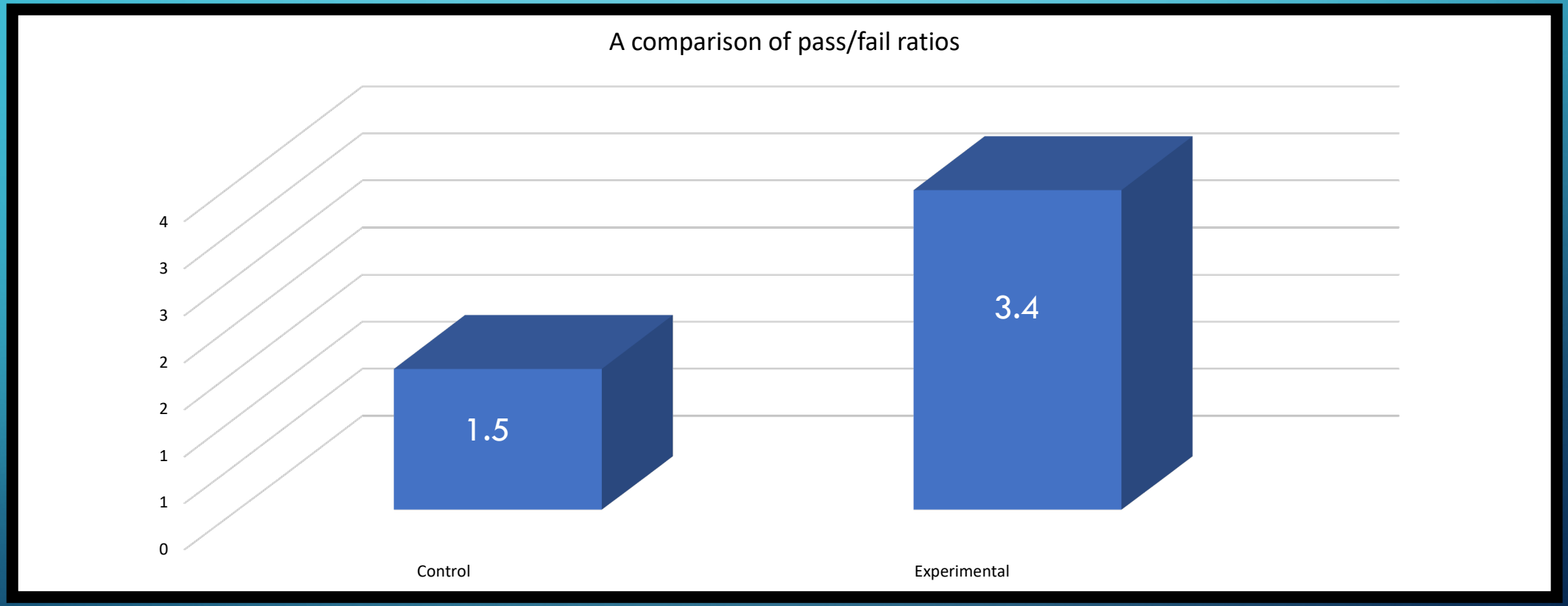
PASS/FAIL RATIO DATA

Pass/fail ratio was determined at the end of the semester.

PASS/ FAIL RATIO GRAPH



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COURSE GPA DATA

Test scores of the students were collected mid-semester and at the end of the semester to determine the GPA. Students' course GPA was calculated by averaging the scores of the midterm and the final exams for each student and then performing a t-test on the students' GPA using SPSS.

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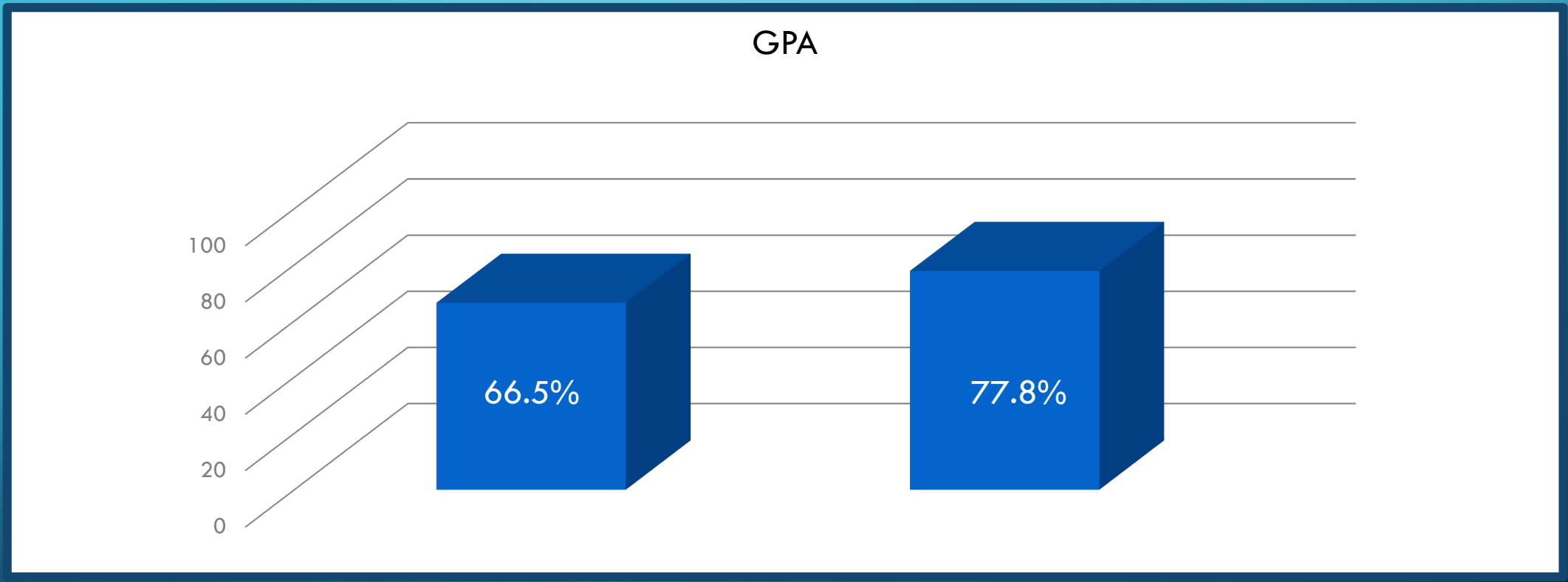
GPA GRAPH



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SPSS GPA

	Control	Experimental
Mean	66.48	77.83
Std. Deviation	5.26	2.66
Skewness	.097	.130
Std. Error of Skewness	.580	.536
Kurtosis	-.276	.265
Std. Error of Kurtosis	1.12	1.04

STUDENTS' PRESPECTIVES

Control class

Two findings emerged:

1. Fast paced and challenging
2. But balanced with support

Experimental class

Three findings emerged:

1. Preferred format
2. Engagement
3. Confidence

PREFERRED FORMAT DUE TO

1. In-class exercises
2. Working with peers
3. The breaking the lessons down “chunking”

ENGAGEMENT AND CONFIDENCE

- The format fostered engagement in the class.
- The more work students completed towards the course, the better results they got, and that raised their confidence.

RESULTS

Collectively, students in the experimental class felt engaged and that might have contributed to their retention and their academic success. As students felt successful, their self-efficacy increased, and they became involved in the process of their own learning, which boosted their retention and grade in the class creating a positive feedback.

Thank you.

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