

Perceptions of Mathematics Bridging Courses Among Diploma Students in Higher Education

Mathematics bridging courses are widely used in higher education to support students who enter university without the required background in mathematics. This study examined how Diploma of Science Education students in the Virtual and Open Distance Learning (VODL) programme at Bindura University of Science Education (BUSE) perceive a mathematics bridging course, and how these perceptions differ across student characteristics such as gender and age. The study was guided by Expectancy-Value Theory, which explains how students' beliefs about their ability and the value they attach to a task influence their engagement. A qualitative case study design was used. Data were collected from thirty-three students using focus group discussions, in-depth interviews, and questionnaires. The qualitative data were analysed using thematic analysis, while questionnaire data were analysed descriptively to support the findings. The results show that students held both positive and negative views about the course. Many students described the course as useful for building foundational knowledge, while others found it difficult because of abstract concepts and the pace of instruction. Emotional responses, particularly anxiety and low confidence, were also reported. Differences were observed across gender and age, with variations in confidence, participation, and perceived usefulness. The findings suggest that students' perceptions are shaped by confidence, emotional experiences, and perceived course value. The study highlights the need for teaching approaches that strengthen relevance, support confidence, and address differences among students. These insights can help improve the design and delivery of mathematics bridging programmes.

Keywords: academic transition, assessment, bridging courses, mathematics education, student perceptions

Introduction

Students' prior achievement in mathematics often determines access to degree programmes in higher education, particularly in science-related fields where it is treated as a basic requirement (Kaliyeva et al., 2025; Wild et al., 2024). Because of this, students who meet general admission requirements but do not have enough mathematical preparation are often required to take bridging or remedial courses before they continue with their studies (Frye et al., 2024; Marschall et al., 2024). The mathematics bridging course is an Ordinary Level support course designed for students who enrol at Bindura University of Science Education (BUSE) without an Ordinary Level mathematics qualification. It prepares them for external examinations, mainly the Zimbabwe School Examinations Council (ZIMSEC). Black (2024) and Wild et al. (2024) show that these programmes are meant to support academic transition, improve readiness, and reduce dropout among underprepared students. In this way, bridging courses serve not only as preparation but also as a response to increasing access to higher education (Black, 2024; Marschall et al., 2024; Wild et al., 2024).

1 In mathematics education, bridging and remedial courses have become more
2 important because many students struggle with prior knowledge, confidence, and
3 performance (DeLucia, 2021; Glasener, 2024). Studies (Mgonja & Robles, 2024;
4 Sgobbi, 2022) show that students entering higher education often have gaps in their
5 understanding of mathematics, and this affects how they engage and perform in later
6 coursework (DeLucia, 2021; Mgonja & Robles, 2024; Sgobbi, 2022). At the same
7 time, efforts by institutions to support these students have shown mixed results
8 (Lane et al., 2023; Petillo & Anuszkiewicz, 2023; Zientek et al., 2022). Some studies
9 report improvements in retention and progression, while others show that students
10 still face challenges in completing their studies and achieving good results (Lane et
11 al., 2023; Petillo & Anuszkiewicz, 2023; Zientek et al., 2022). This suggests that
12 academic support alone may not fully explain why some students succeed while
13 others struggle.

14 Because of this, attention has moved toward students' perceptions and
15 experiences as key factors in mathematics learning (Harrell, 2023; Muchuweni et
16 al., 2026; Ochoa et al., 2026; Steflitsch & Kollosche, 2025). Atkinson and Risser
17 (2023), Harrell (2023), and Steflitsch and Kollosche (2025) show that students'
18 attitudes, beliefs, and emotions play an important role in how they engage with
19 mathematical tasks and how they persist when learning becomes difficult. In
20 particular, how students view the relevance, difficulty, and usefulness of a course
21 can influence how they approach learning and respond to teaching methods
22 (Büdenbender-Kuklinski et al., 2024; Osborne & Hibbard, 2025; Muchuweni &
23 Jojo, 2026a). These findings show that understanding learning experiences is
24 important for explaining differences in participation and outcomes.

25 Albelbisi et al. (2024), McCullagh et al. (2024), and Namkung et al. (2025)
26 have also shown that emotional factors, especially mathematics anxiety, affect how
27 students experience mathematics courses. Studies (Namkung et al., 2025; Park et
28 al., 2024; Ryan et al., 2025) indicate that anxiety can lower performance, reduce
29 confidence, and limit students' willingness to engage with mathematical content
30 (McCullagh et al., 2024; Namkung et al., 2025; Park et al., 2024; Ryan et al., 2025).
31 In addition, emotional responses are often linked to previous learning experiences,
32 teaching approaches, and assessment practices. This means that perceptions develop
33 through interaction with the learning environment, rather than existing on their own
34 (Leppma & Darrah, 2024; Yarkwah et al., 2024). These findings highlight the need
35 to study perceptions as part of understanding mathematics learning.

36 Apart from emotional factors, student characteristics also influence how
37 mathematics is experienced. Awoniyi et al. (2025), Barroso et al. (2025), and
38 Mamolo and Labina (2025) show that factors such as gender can affect attitudes,
39 confidence, and performance in mathematics. Although these patterns are not the
40 same in all contexts, they suggest that students may experience and understand
41 learning differently (Gómez-Chacón et al., 2024; Mamolo & Labina, 2025; Rehman
42 et al., 2025). This highlights the importance of considering such differences when
43 examining bridging programmes.

44 Even though there is a growing body of research on remedial and bridging
45 mathematics education, much of it focuses on outcomes like performance, retention,
46 and progression (Black, 2024; Lane et al., 2023; Zientek et al., 2022). Less attention

1 has been given to how students themselves understand and experience these
2 programmes (Harrell, 2023). Studies (Stefflitsch & Kolloosche, 2025; Torres, 2023)
3 that do examine student perspectives show that students can hold very different
4 views. Some see these courses as helpful and necessary, while others see them as
5 difficult or discouraging (Black, 2024; Harrell, 2023; Torres, 2023). These
6 differences show the need for a more focused study on students' perceptions,
7 especially within specific institutions.

8 In university settings, mathematics bridging courses are important because they
9 often determine whether students can continue with their studies (Black, 2024;
10 Marschall et al., 2024; Wild et al., 2024). Since these courses can either support or
11 limit academic progress, the way students understand and respond to them can
12 influence their participation, engagement, and overall learning. In addition, this
13 study contributes to mathematics education research by showing how expectancy
14 beliefs, emotional experiences, and task value shape students' views of a
15 mathematics bridging programme within a Zimbabwean university context.

16 17 **Problem Statement**

18
19 Black (2024), Marschall et al. (2024), and Wild et al. (2024) show that research
20 on mathematics bridging and remedial programmes has mainly focused on
21 measurable outcomes such as performance, retention, and progression, with less
22 attention given to how students themselves understand and experience these
23 courses. Although some studies (Harrell, 2023; Ochoa et al., 2026) recognise that
24 students have different views about mathematics learning environments, there is still
25 limited evidence that clearly examines the specific perceptions students develop in
26 bridging courses, especially in relation to relevance, difficulty, and overall learning
27 experience (Stefflitsch & Kolloosche, 2025). This creates a gap in understanding how
28 students' perceptions influence their engagement and participation in these
29 programmes. Without a clear understanding of these perceptions, efforts to support
30 students in bridging courses may not be fully effective. Teaching strategies and
31 institutional support may not match how students actually experience the learning
32 process. This may lead to continued low engagement, irregular participation, and
33 limited success in mathematics bridging courses, even when structured academic
34 support is available (Mgonja & Robles, 2024; Petillo & Anuszkiewicz, 2023). To
35 address this gap, this study focuses on examining how students perceive the
36 mathematics bridging course and how these perceptions differ across selected
37 student characteristics. The following research questions guide the study:

- 38
39 1) What perceptions do Diploma of Science Education students hold about the
40 mathematics bridging course?
41 2) How do these perceptions vary across student characteristics (e.g., gender
42 and age)?
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Literature Review

This section looks at existing research on students' experiences and views in mathematics learning environments, with a focus on bridging and remedial courses in higher education. It brings together studies that explain how students understand the usefulness, difficulty, and overall value of mathematics courses. It also considers how these perceptions are influenced by learning experiences and teaching practices. In addition, it includes research that examines differences in students' views across factors such as gender and age, to give a broader understanding of how perceptions vary.

Students' Perceptions of Mathematics Bridging Courses

Students' perceptions of mathematics courses are shaped by their experiences in the learning environment, including how teaching is done, how assessments are structured, and how relevant the content appears to them (Atkinson & Risser, 2023; Esona et al., 2026; Harrell, 2023; Steflitsch & Kollosche, 2025; Muchuweni & Jojo, 2026b). Büdenbender-Kuklinski et al. (2024) and Osborne and Hibbard (2025) show that students often decide whether a course is useful based on how well it connects to their academic goals and future careers. When students clearly see this connection, they are more likely to take part actively in learning. However, when the course seems less relevant, their motivation and participation may decrease.

Another important factor is how difficult students perceive mathematics to be (DeLucia, 2021; Mgonja & Robles, 2024). Evidence (Mgonja & Robles, 2024; Sgobbi, 2022) shows that many students find mathematics challenging because of abstract concepts, gaps in prior knowledge, and low confidence in their abilities (DeLucia, 2021; Mgonja & Robles, 2024; Sgobbi, 2022). These perceptions are often stronger in bridging and remedial courses, where students are expected to review basic concepts while also preparing for more advanced learning (Black, 2024; Glasener, 2024; Sgobbi, 2022). Because of this, students may face both thinking difficulties and emotional challenges during the course.

Emotional responses, especially mathematics anxiety, also play a strong role in shaping students' perceptions (McCullagh et al., 2024; Namkung et al., 2025; Ryan et al., 2025). Studies (Namkung et al., 2025; Park et al., 2024; Ryan et al., 2025) show that anxiety affects how students approach tasks, take part in lessons, and judge their own performance (McCullagh et al., 2024; Namkung et al., 2025; Park et al., 2024; Ryan et al., 2025). Students with higher levels of anxiety often see mathematics as stressful and difficult, which can reduce their willingness to engage fully in learning activities.

Students' views on assessment also influence how they see mathematics courses (Atkinson & Risser, 2023; Quane, 2025). Harrell (2023) and Atkinson and Risser (2023) show that when assessments are clear, fair, and well connected to what is taught, students tend to develop more positive attitudes toward the course. On the other hand, when expectations are not clear or when assessments do not match the teaching, students may feel frustrated and become less engaged (Atkinson & Risser,

1 2023). This indicates that assessment design is an important part of the learning
2 experience.

3 Past learning experiences (Leppma & Darrah, 2024; Yarkwah et al., 2024) also
4 affect how students view mathematics at university level. Students who had
5 negative experiences before are more likely to enter new courses with low
6 confidence and higher anxiety (Leppma & Darrah, 2024; Yarkwah et al., 2024). In
7 contrast, those with positive experiences often show more confidence and a better
8 attitude toward learning (Gómez-Chacón et al., 2024; Mamolo & Labina, 2025;
9 Rehman et al., 2025). This means that students' perceptions are influenced by what
10 they have experienced over time.

11 Black (2024) and Harrell (2023) show that students do not all see bridging and
12 remedial programmes in the same way. Some students describe them as helpful and
13 supportive for building basic knowledge, while others see them as barriers or extra
14 burdens in their studies (Harrell, 2023; Torres, 2023). These different views show
15 that the same course can be experienced differently, depending on the student's
16 background, expectations, and learning situation. These studies show that students'
17 perceptions of mathematics bridging courses are shaped by a mix of thinking,
18 emotional, and contextual factors. Understanding these perceptions helps to explain
19 how students engage with bridging programmes and how their experiences
20 influence their learning outcomes.

21 22 **Differences in Students' Perceptions Based on Gender and Age**

23

24 Students do not all see mathematics in the same way, and research shows that
25 these differences are often linked to personal factors such as gender and age
26 (Awoniyi et al., 2025; Mamolo & Labina, 2025). Several studies (Barroso et al.,
27 2025; Ochoa et al., 2026) show that gender can influence how students feel about
28 mathematics, especially in terms of confidence, interest, and participation (Awoniyi
29 et al., 2025; Barroso et al., 2025). In many cases, male students report higher
30 confidence in mathematics, while female students are more likely to feel unsure or
31 anxious, even when their actual performance is similar (Awoniyi et al., 2025;
32 Barroso et al., 2025). This suggests that perceptions are not only based on ability,
33 but also on how students understand their own learning experiences.

34 Emotional responses help to explain these differences further (McCullagh et
35 al., 2024; Ryan et al., 2025). Namkung et al. (2025) and Ryan et al. (2025) show
36 that mathematics anxiety affects how students approach tasks and how they view
37 the subject overall. Students with higher anxiety often see mathematics as difficult
38 and stressful, which can reduce their willingness to take part in class and complete
39 tasks (Park et al., 2024). In contrast, students with lower anxiety are more likely to
40 approach mathematics with confidence and continue working even when tasks are
41 challenging (Egara & Mosimege, 2025; Ersozlu, 2024; Lei et al., 2025). These
42 emotional differences can therefore lead to different views of the same course.

43 Age also affects how students experience mathematics courses (McCullagh et
44 al., 2024; Ryan et al., 2025). Evidence shows that younger students are often more
45 open to learning and more willing to take part in class activities, while older students
46 may have other responsibilities that affect their time and focus (Park et al., 2024).

1 In some cases, mature students return to education with gaps in their prior
2 knowledge, which can influence how they see the difficulty and usefulness of
3 mathematics courses (Ryan et al., 2025; Sgobbi, 2022). At the same time, older
4 students may also have stronger motivation and clearer goals, which can lead to
5 either more positive or more critical views depending on their experiences.

6 Previous learning experiences also work together with gender and age to shape
7 students' perceptions (Leppma & Darrah, 2024). Studies (Yarkwah et al., 2024)
8 show that students who had negative experiences in mathematics are more likely to
9 develop low confidence and negative attitudes toward the subject (Leppma &
10 Darrah, 2024; Yarkwah et al., 2024). These experiences often continue into higher
11 education and affect how students respond to new learning situations, including
12 bridging courses (DeLucia, 2021; Sgobbi, 2022). On the other hand, students with
13 stronger mathematical backgrounds may see these courses as useful opportunities
14 to improve their understanding rather than as obstacles (Mgonja & Robles, 2024).

15 Students also differ in how they view the purpose and value of mathematics
16 courses (Harrell, 2023). Some see bridging courses as important support for their
17 academic success, while others see them as an extra burden that slows down their
18 progress (Torres, 2023). These different views are influenced by personal factors
19 such as gender, age, and past learning experiences. Because of this, students in the
20 same class may respond differently to the same course. In essence, research shows
21 that gender and age play a role in shaping how students understand and respond to
22 mathematics courses. These factors influence confidence, anxiety, participation, and
23 how useful students think the course is. Recognizing these differences helps to
24 explain why students develop different perceptions of mathematics bridging
25 courses, even when they are taught in the same way.

26 27 28 **Theoretical Framework** 29

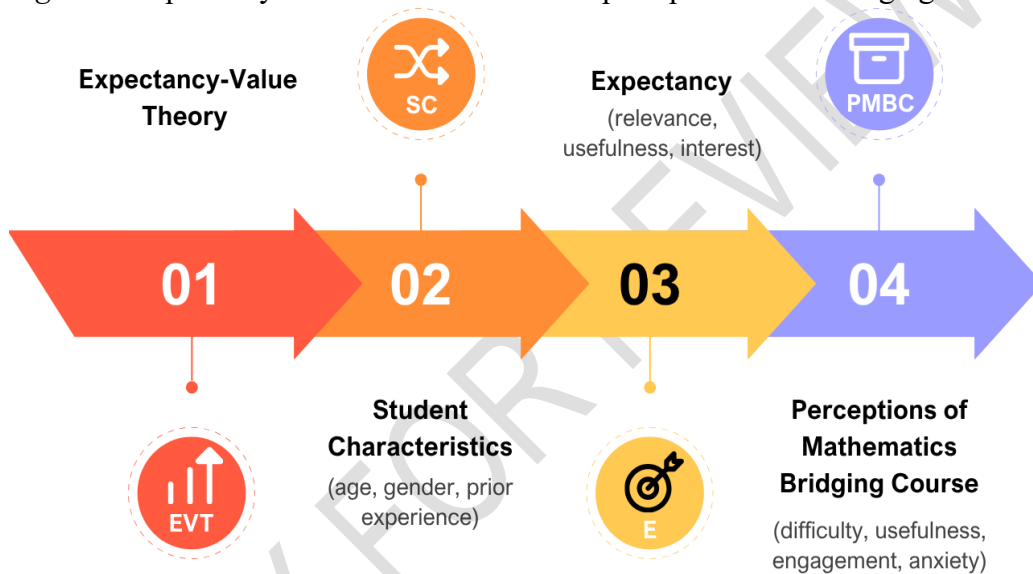
30 This study is guided by Expectancy-Value Theory (EVT) proposed by Eccles
31 and Wigfield (2002), which explains how students' beliefs and values influence
32 their learning experiences and their engagement in academic tasks. According to
33 this theory, students decide whether to take part in a learning activity based on two
34 main factors: their expectation of success and the value they attach to the task.
35 Expectation of success refers to how much students believe they can perform well,
36 while task value includes how useful, important, or interesting they find the learning
37 activity (Büdenbender-Kuklinski et al., 2024; Mamolo & Labina, 2025; Osborne &
38 Hibbard, 2025).

39 In mathematics learning, EVT helps explain why students may respond
40 differently to the same course (Büdenbender-Kuklinski et al., 2024; Mamolo &
41 Labina, 2025; Osborne & Hibbard, 2025). Students who believe they can succeed
42 in mathematics are more likely to participate actively and continue working when
43 they face challenges (DeLucia, 2021; Mgonja & Robles, 2024; Sgobbi, 2022). In
44 contrast, students who doubt their ability may feel anxious and withdraw from
45 learning activities. At the same time, students are more likely to value a course when
46 they see it as relevant to their academic goals or future careers. When the course is

1 seen as less valuable, motivation may decrease and negative perceptions may
2 develop.

3 This theory fits this study because it gives a clear way to understand how
4 students form perceptions about the mathematics bridging course (Harrell, 2023;
5 Ochoa et al., 2026; Steflitsch & Kollosche, 2025). It helps explain how beliefs about
6 ability and the value students attach to the course shape how they see its relevance,
7 difficulty, and usefulness. By using EVT, the study links students' perceptions to
8 their learning experiences in a clear and structured way. Figure 1 shows a conceptual
9 model based on Expectancy-Value Theory, illustrating how students' expectations
10 of success and the value they attach to the task influence their perceptions of the
11 mathematics bridging course.
12

13 *Figure 1.* Expectancy-Value model of students' perceptions of the bridging course



14
15 Source: Authors' own elaboration

18 Methodology

19
20 This study adopted a qualitative case study approach to examine students'
21 perceptions of a mathematics bridging course at BUSE. A qualitative design was
22 appropriate because the study focused on how students understood and experienced
23 their learning rather than only measuring outcomes. Research by Harrell (2023) and
24 Steflitsch and Kollosche (2025) shows that qualitative methods are useful for
25 exploring students' views, beliefs, and experiences in educational settings. The case
26 study design allowed the researcher to examine the bridging course within its real-
27 life setting, taking into account institutional conditions and student characteristics
28 (Black, 2024; Torres, 2023).

29 The participants consisted of Diploma of Science Education students at BUSE
30 who had completed at least one semester of the mathematics bridging course
31 through the Virtual and Open Distance Learning (VODL) programme. A total of
32 thirty-three students participated in the study. The participants were selected

1 purposively to ensure that only students with direct experience of the course were
2 included (DeLucia, 2021; Mgonja & Robles, 2024). The participants were distinct
3 across the data collection methods, with no overlap.

4 Data were collected using focus group discussions (6 students), in-depth
5 interviews (5 students), and questionnaires (22 students). Between 2012 and 2013,
6 data were collected at the Chindunduma VODL Centre of Bindura University of
7 Science Education (BUSE) from students enrolled in the mathematics bridging
8 course. Although the data were collected during the researcher's Master's studies,
9 the findings remain relevant because mathematics bridging programmes continue to
10 play an important role in supporting underprepared students in higher education
11 (Black, 2024; Wild et al., 2024). Focus group discussions allowed participants to
12 share and reflect on their experiences collectively, while interviews provided deeper
13 insight into individual experiences. Questionnaires were used to gather additional
14 responses and identify general patterns in students' perceptions. The use of these
15 methods strengthened the study through triangulation, allowing comparison of
16 findings across data sources (Harrell, 2023; Steflitsch & Kolloosche, 2025).

17 The data from interviews and focus group discussions were analysed using
18 thematic analysis, which involves identifying patterns and organising responses into
19 themes. The analysis focused on areas such as perceived relevance, difficulty,
20 emotional responses, and views on assessment. Questionnaire data were analysed
21 descriptively to support the qualitative findings and highlight common trends.

22 Ethical considerations were observed throughout the study. Participation was
23 voluntary, and students were informed about the purpose of the research before data
24 collection. Confidentiality was maintained by ensuring that participants' identities
25 were not disclosed (DeLucia, 2021). To ensure trustworthiness, credibility was
26 supported through the use of multiple data sources, while dependability was
27 maintained through consistent procedures during data collection and analysis.
28 Confirmability was ensured by grounding the findings in participants' responses
29 rather than researcher assumptions.

30 31 32 **Results**

33
34 This section presents the findings from the data collected through focus group
35 discussions, in-depth interviews, and questionnaires. It reports the patterns that
36 appeared in students' responses about how they view the mathematics bridging
37 course. These include their views on its relevance, level of difficulty, emotional
38 experiences, and overall learning value. The section also reports differences seen in
39 students' responses across different groups. A total of thirty-three participants
40 contributed data through focus group discussions, in-depth interviews, and
41 questionnaires.
42

1 Students' Perceptions of the Mathematics Bridging Course

2
3 Students shared different views about the mathematics bridging course,
4 showing both positive and negative perceptions. A clear pattern in the responses
5 shows that many students described the course as useful, especially in helping them
6 build basic knowledge needed for their main programme. Several participants
7 indicated that the course gave them a chance to strengthen concepts they had not
8 fully understood before entering university. One student explained, "*The bridging*
9 *course helped me understand the basics that I did not get in high school*" (INT-S2).
10 A similar view was shared during the focus group, where a participant stated, "*It*
11 *gave us a foundation, especially for topics we had forgotten*" (FC-S3). In these
12 responses, the course was seen as an important step toward academic progress.

13 At the same time, some students described the course as challenging. Many
14 responses referred to the abstract nature of mathematical concepts and the fast pace
15 at which the content was taught. One participant noted, "*Some of the topics were*
16 *too abstract, and the lecturer moved very fast*" (INT-S4). Another student added,
17 "*If you did not already know the basics, it was very hard to follow*" (FC-S2). Some
18 participants indicated that they struggled to keep up with lessons, especially when
19 they had gaps in prior knowledge. This is reflected in the comment, "*I was lost most*
20 *of the time because I did not have a strong background*" (INT-S1). In these cases,
21 the course was described as demanding and, at times, overwhelming.

22 Emotional responses were also shown in the data. Some students reported
23 feeling anxious when working on mathematical tasks, especially during tests and
24 examinations. One student stated, "*I get nervous when I see the questions, especially*
25 *in tests*" (INT-S3). Another participant shared, "*Mathematics makes me anxious,*
26 *especially when I am not sure of the answers*" (FC-S5). These responses included
27 fear of failure and low confidence when solving problems. In contrast, other students
28 reported gaining confidence as they moved through the course. For example, one
29 student explained, "*As time went on, I started to understand better and felt more*
30 *confident*" (INT-S5), while another noted, "*Practice helped me, and I became less*
31 *afraid of maths*" (FC-S1). This indicates that emotional experiences were not the
32 same for all students.

33 Students also spoke about how relevant the course was to their academic goals.
34 Many responses showed that the course was seen as necessary for success in their
35 chosen programmes, especially in science-related fields. One participant mentioned,
36 "*You need this course if you want to pass your Ordinary level mathematics*" (FC-
37 S4). Another stated, "*It is important because most of our courses depend on*
38 *mathematics*" (INT-S2). However, some participants questioned its immediate
39 usefulness. For example, one student said, "*Sometimes I do not see how this topic*
40 *connects to the ZIMSEC examination*" (INT-S4). These responses show differences
41 in how students understood the value of the course.

42 Views on assessment were also reported. Several students described tests and
43 assignments as helpful in preparing them for final examinations. One participant
44 explained, "*The tests helped me prepare for exams because they showed the type of*
45 *questions*" (FC-S6). At the same time, others expressed concern about the difficulty
46 and pressure linked to these assessments. One student stated, "*The tests were too*

1 *difficult, and there was a lot of pressure*” (INT-S1). Some responses pointed to a
 2 mismatch between what was taught in class and what was tested, as reflected in the
 3 comment, *“Sometimes what we learn is not exactly what comes in the test”* (FC-
 4 S2), while others showed satisfaction with how assessments were structured. The
 5 responses show that students held different perceptions of the mathematics bridging
 6 course. These perceptions reflected differences in understanding, confidence,
 7 emotional experiences, and how useful the course was seen to be. Table 1 presents
 8 a summary of the key perception themes identified from the data.

9
 10 *Table 1. Summary of Key Perception Themes*

Theme	Description
Usefulness	Course helped build foundational knowledge
Difficulty	Abstract concepts and fast pace
Emotional Response	Anxiety vs growing confidence
Relevance	Linked vs not clearly linked to programme
Assessment	Helpful vs challenging/misaligned

11 12 **Variations in Students’ Perceptions Across Gender and Age**

13
 14 Differences were observed in how students described their experiences of the
 15 mathematics bridging course when responses were compared across gender and age
 16 groups. The responses show variation in confidence, emotional reactions, and
 17 engagement with the course.

18 The data suggest that some male students more often described themselves as
 19 confident when working on mathematical tasks. Their responses included
 20 willingness to attempt problems and take part in class activities. One male student
 21 explained, *“I usually try the questions even if I am not sure, because I believe I can
 22 get it”* (INT-S2). A similar view was shared in the focus group, where a participant
 23 stated, *“I like challenging questions, they make me think more”* (FC-S4). In contrast,
 24 several female students reported lower confidence and expressed concerns about
 25 making mistakes, especially during tests and examinations. One student shared, *“I
 26 am afraid of getting the wrong answer, especially in tests”* (INT-S3), while another
 27 noted, *“Sometimes I do not answer because I feel I might be wrong”* (FC-S1). These
 28 responses also included feelings of anxiety when working on mathematical
 29 problems.

30 Emotional experiences also differed across groups. Some students described
 31 feeling stressed during assessments, while others reported handling these situations
 32 with more confidence. One participant stated, *“Tests make me very nervous, I panic
 33 even when I know the work”* (INT-S1). Another explained, *“I feel pressure during
 34 exams, and it affects how I think”* (FC-S5). Higher levels of anxiety were more often
 35 reported among students who showed low confidence in their mathematical ability.
 36 At the same time, some participants reported gaining confidence over time. For
 37 example, one student noted, *“After practicing more, I started to feel better about*

1 *maths*” (INT-S5), while another added, “*Now I can try questions without fear like*
2 *before*” (FC-S2). This suggests that emotional experiences changed for some
3 students as they became more familiar with the course.

4 Differences were also seen across age groups. Younger students often described
5 themselves as more active in class, with regular participation in lessons and group
6 discussions. One participant stated, “*I like participating in class because it helps me*
7 *understand better*” (FC-S3). Another explained, “*I ask questions when I do not*
8 *understand*” (INT-S4). Older students, on the other hand, referred to challenges
9 related to balancing academic work with other responsibilities. One student shared,
10 “*It is difficult to study all the time because I have other responsibilities*” (INT-S1).
11 Another added, “*Sometimes I do not have enough time to practice because of other*
12 *commitments*” (FC-S6). These responses included limited study time and difficulty
13 keeping up with course demands.

14 Differences also appeared in how students viewed the usefulness of the course.
15 Some participants described the course as an important step toward achieving their
16 academic goals. For example, one student stated, “*This course is important for my*
17 *future studies*” (INT-S2), while another noted, “*It helps me prepare for other*
18 *subjects*” (FC-S4). In contrast, others saw it as a requirement that delayed their
19 progress. One participant explained, “*It feels like it is slowing me down before I start*
20 *my main programme*” (INT-S3). These views were found across both gender and
21 age groups, showing that students understood the purpose of the course in different
22 ways. The responses show that students’ perceptions of the mathematics bridging
23 course were not the same. Differences in confidence, emotional responses,
24 participation, and views on usefulness were observed across gender and age groups.
25 Table 2 presents a summary of the variations in students’ perceptions across gender
26 and age.

27
28 *Table 2. Summary of Variations in Students’ Perceptions*

Factor	Variation Observed
Gender - Confidence	Some male students reported higher confidence, some female students were more cautious
Gender - Emotion	Some female students reported higher levels of anxiety
Age - Participation	Younger students were more active in class participation
Age - Challenges	Older students faced time and responsibility constraints
Perceived Value	The course was seen as helpful by some students and as delaying progress by others

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Discussion

33 This section explains the findings by linking students’ reported experiences
34 with existing research and the guiding theoretical framework. It focuses on how
35 students’ views about usefulness, difficulty, emotional responses, and assessment
36 can be understood in relation to their beliefs about success and the value they attach

1 to the course. It also considers how individual differences influence these
2 perceptions, helping to explain why students experience the same learning
3 environment in different ways.

4 **Interpreting Students' Perceptions of the Mathematics Bridging Course**

5
6
7 The patterns in the findings show that students' perceptions of the mathematics
8 bridging course are closely linked to how they judge their ability to succeed and
9 how much value they attach to the course. When students described the course as
10 useful and important for their academic progress, this reflects a strong sense of task
11 value, which is a key idea in Expectancy-Value Theory (Büdenbender-Kuklinski et
12 al., 2024; Mamolo & Labina, 2025). Similar findings are reported in studies
13 showing that students are more likely to engage in learning when they see clear links
14 between course content and their academic or career goals (Osborne & Hibbard,
15 2025; Muchuweni & Jojo, 2026a, 2026b). This highlights that perceived relevance
16 plays an important role in shaping positive attitudes toward the course.

17 At the same time, the challenges and difficulties reported by students point to
18 differences in their expectations of success. Students who experienced the course as
19 demanding were often those with gaps in prior knowledge or lower confidence in
20 mathematics. Research shows that low confidence is linked to lower participation
21 and greater difficulty in engaging with mathematical tasks (DeLucia, 2021; Mgonja
22 & Robles, 2024; Sgobbi, 2022). This suggests that perceptions of difficulty are not
23 only about the content itself but also about how students evaluate their ability to
24 manage the learning demands, which reflects differences in expectancy beliefs.

25 Emotional responses, especially anxiety, give further insight into how students
26 experience the course. Reports of stress and fear during assessments are consistent
27 with findings in previous studies, where mathematics anxiety is shown to affect both
28 performance and engagement (McCullagh et al., 2024; Namkung et al., 2025; Park
29 et al., 2024; Ryan et al., 2025). In this context, anxiety can reduce students'
30 expectations of success and make the course appear more difficult. At the same time,
31 the increase in confidence reported by some students suggests that positive learning
32 experiences can gradually strengthen students' beliefs about their ability to succeed.

33 Students' views on assessment also show the importance of alignment between
34 teaching and evaluation. When assessments were experienced as clear and
35 supportive, students were more likely to develop positive perceptions of the course.
36 This is in line with research showing that well-structured assessment practices can
37 improve student engagement and understanding (Atkinson & Risser, 2023; Harrell,
38 2023). In contrast, when assessments were perceived as difficult or not aligned with
39 teaching, negative perceptions were more likely to develop, indicating that unclear
40 expectations can weaken both confidence and perceived value. These interpretations
41 show that students' perceptions of the mathematics bridging course are shaped by a
42 combination of perceived value, confidence, emotional experience, and assessment
43 practices. These factors interact to influence how students engage with the course
44 and how they respond to its demands. This aligns with Expectancy-Value Theory,
45 where engagement is influenced by expectations of success and the value attached
46 to the task.

1 **Interpreting Variations in Students' Perceptions Across Gender and Age**

2
3 The differences shown in the findings indicate that students do not experience
4 the mathematics bridging course in the same way, and these differences are closely
5 linked to variations in confidence, emotional responses, and personal situations
6 identified in the data. The higher confidence observed among some male students
7 suggests stronger expectations of success, which are associated with greater
8 participation and willingness to attempt mathematical tasks. Similar patterns are
9 reported in research showing that confidence plays an important role in how students
10 approach mathematics, even when performance levels are similar across groups
11 (Awoniyi et al., 2025; Barroso et al., 2025). This indicates that the variation in
12 participation observed in the study reflects differences in expectancy beliefs.

13 In contrast, the lower confidence and higher levels of anxiety identified among
14 some female students highlight the role of emotional factors in shaping learning
15 experiences. Research shows that mathematics anxiety can reduce participation and
16 make tasks appear more difficult, especially when students doubt their ability to
17 succeed (Namkung et al., 2025; Ryan et al., 2025). In this study, these emotional
18 differences help explain why some students engaged less with tasks despite being
19 exposed to the same learning conditions. From an Expectancy-Value perspective,
20 anxiety reduces expectations of success, which weakens engagement.

21 Differences across age groups also reflect patterns observed in the findings. The
22 higher levels of participation associated with younger students suggest fewer
23 external pressures and greater flexibility in engaging with the course. In contrast,
24 the challenges reported by older students, including limited time and competing
25 responsibilities, show how external factors shape learning experiences. Studies
26 show that such factors influence engagement and performance, especially in
27 demanding subjects like mathematics (McCullagh et al., 2024; Park et al., 2024).
28 This suggests that variations in participation and perceived difficulty are influenced
29 not only by the course itself but also by the broader context in which students are
30 learning, affecting both expectancy and value.

31 The differences in how students viewed the usefulness of the course also reflect
32 variation identified in the findings. Students who saw the course as important for
33 their academic progress showed more positive engagement, while those who viewed
34 it as delaying their progress were less motivated. Similar findings in previous
35 research show that how students value a course influences their level of engagement
36 and persistence (Black, 2024; Torres, 2023). This highlights the role of task value
37 in shaping students' responses to the course. These findings show that gender and
38 age influence how students understand their experiences, but they do not act
39 independently. Instead, they interact with confidence, anxiety, prior experiences,
40 and personal circumstances to shape overall perceptions. As a result, differences
41 observed in the study can be explained as variations in expectations of success and
42 perceived value, which together influence how students engage with the
43 mathematics bridging course.

44

Limitations

This study is limited to one institution, which means the findings may not represent all mathematics bridging courses in other universities. In addition, the study focused on a relatively small group of students, and their responses were based on their own experiences and opinions. This may limit the transferability of the findings to a wider population. These limitations were addressed by including students with direct experience of the mathematics bridging course through the Virtual and Open Distance Learning (VODL) programme, which provided detailed insight into students' learning experiences. The use of multiple data collection methods, including interviews, focus group discussions, and questionnaires, also helped to strengthen the findings by allowing comparison across different sources. As a result, the study provides a reliable understanding of students' perceptions within the context examined.

Conclusion

This study examined how students understand and experience a mathematics bridging course in a university setting. The findings show that students understood and experienced the course differently, with their views shaped by a mix of confidence, prior learning experiences, emotional responses, and how they judged the value of the course for their academic progress. One clear outcome is that students' views are closely linked to how they see their chances of success and how useful they believe the course is. When students see the course as important for their studies, they are more likely to take part and stay engaged. In contrast, when the course is seen as difficult or not clearly connected to their goals, participation becomes weaker. This suggests that perceptions are influenced not only by the course itself, but also by how students understand their role in the learning process.

The findings also show that differences among students play an important role in shaping these views. Differences linked to gender and age show that students bring different levels of confidence, emotional experiences, and life situations into the same learning environment. This helps explain why students in the same class can respond in different ways, even when they are taught under the same conditions. Another important point is that students' experiences are influenced by more than just what is taught. Emotional factors, especially anxiety, and practical factors, such as time and outside responsibilities, also shape how students understand the course. This means that learning in bridging programmes is influenced by both academic and non-academic factors.

This study helps deepen understanding of how students experience mathematics bridging courses in higher education. The findings show that students' views are shaped through the interaction of confidence, emotional experiences, prior learning, and the value they attach to the course. By highlighting these relationships within a Zimbabwean university context, the study contributes to ongoing discussions on student engagement, support, and participation in mathematics bridging education. Recognising these factors is important for improving how

1 bridging programmes are designed and how students are supported during academic
2 transition.

3 4 5 **Implications for Practice and Recommendations** 6

7 The findings of this study show that students' perceptions of mathematics
8 bridging courses are influenced by how they understand the value of the course, how
9 confident they feel, and how they experience learning activities. This has important
10 implications for how these courses are designed and delivered. Instructors and
11 programme designers need to clearly link the bridging course to students' main
12 fields of study so that students can see its relevance. When students understand how
13 the course supports their academic goals, they are more likely to engage with the
14 content and take part actively in learning.

15 There is also a need to focus on building students' confidence in mathematics.
16 Some students enter the course with low confidence and gaps in their prior
17 knowledge. Teaching approaches that support step-by-step understanding and
18 provide regular feedback can help improve their learning experience. A supportive
19 classroom environment, where students feel free to ask questions and make
20 mistakes, can also reduce anxiety and encourage participation. Assessment practices
21 need to match what is taught. When students clearly understand what is expected
22 and see a strong link between teaching and assessment, they are more likely to
23 respond positively to the course. Providing practice activities and feedback before
24 major assessments can help students prepare better and reduce stress.

25 The findings also show the importance of considering differences among
26 students. Students come from different backgrounds and face different challenges,
27 so flexible support systems are important. For example, extra support sessions or
28 structured study opportunities can help students who are struggling, while still
29 keeping more confident students engaged. Improving mathematics bridging courses
30 requires attention to both teaching and student needs. Making the course clear,
31 supportive, and relevant can help create a better learning experience and support
32 students in reaching their academic goals.

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