Western Cape Government
Education
FOR YOU

Directorate: Business Strategy and Stakeholder Management

Analysis Report: The impact of Growth Mindset on Grade 12 learners

September 2021

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1. Introduction

In 2020, all schools with Grade 12 were invited to participate in the Growth Mindset (GM) intervention. These were learners in 383 ordinary public schools. The GM intervention is aimed at changing the beliefs of individuals, from a fixed to a growth mindset. Videos were used to instil GM and are designed in such a way that they progressively provide and unpack information to better understand a growth mindset.

2. Methodology

2.1 The design of the intervention

Participating Grade 12 learners attended five sessions of interactive videos and activities accessible via an online link. The videos were shared with the GM coordinators and principals of schools with Grade 12 via Registry.

2.2 Data collection tools

The participating Grade 12 learners completed a baseline questionnaire before exposure to the interactive videos. The same questionnaire was administered to the learners at the end of the intervention. Both questionnaires were administered using Google forms and consisted of four questions with a five-Likert scale: "completely true", "a little true", "both", "a little not true", and "not at all true". The questionnaires, originally in English, were translated into Afrikaans and Xhosa, which gave the learners an opportunity to respond in a language they were most comfortable with.

2.3 Analysis methods

- Graphs and tables are used to describe the demographic background and geographic clusters. The extent of participation by the primary beneficiaries is presented in absolute numbers and percentages. This includes schools with Grade 12 and the 2020 Grade 12 cohort.
- The GM index is used to measure a change in mindset comparing the attitudes of the Grade 12 learners before and after the intervention.
    - The indices are also compared to the 2017 pilot index of 2,94, to assess the extent of growth since the pilot index.
- The t-test is used to assess whether the estimated baseline and endline difference is consistent with having no difference.
    - The magnitude of the change is also assessed using background characteristics, age, gender, and the National Quintile (NQ).
- The impact of the GM intervention on the learners is measured using the overall National Senior Certificate (NSC) results comparing the performance of 2019 to that of 2020 in the participating schools.
    - The NQ is the only variable used to evaluate whether the state of mind is associated with performance or not. This is because many of the learner results could not be linked to a school. Meanwhile the school EMIS number makes it possible to link a school to a NQ.
- The impact of the GM on the learners is also measured using the dropout rate between June and December, comparing 2019 to 2020, in the participating schools.

2.3.1 Research questions

All the questions were addressed using the statistics generated from the participating schools and results, comparing the baseline to the endline, the 2019 NSC overall results to 2020 and the 2019 dropout rate to that of 2020.

- Is the number of participating schools and learners sufficient to draw conclusions from the study?
- What is the proportion of learners with a growth mindset before and after the intervention?
- What is the GM index of the Grade 12 learners before and after the intervention?
  - How did the impact of the GM intervention vary by age, gender, and the NQ?
  - How far is the GM index from the 2017 pilot of 2,94?
- How did the intervention impact the overall achievement of the Grade 12 learners in their final NSC examination?
  - Are there differences based on NQ?
- How did the intervention impact the Grade 12 learner dropout rate?

3.1 Meta data

The baseline and endline questionnaires were administered electronically using Google forms. Two variables were important for inclusion as they link the baseline, endline and learner performance data as follows:

- The school EMIS number uniquely identifies the school the learner attends; and
- The learner CEMIS number uniquely identifies each learner and links the learner to a school.

Most of the learners did not have the linking variables and, for most, the digits were incomplete. As an example, the school EMIS number consists of 10 digits and 9 since the "0" in the beginning is sometimes omitted by some computers. Similarly, the learner CEMIS number has a specific number of digits.

The absence of the EMIS and CEMIS numbers or incomplete unique identification numbers led to the elimination of many learners from the analysis as their baseline and endline responses could not be properly matched or linked.

The baseline and endline learner responses were received from the manager of the programme at the same time for analysis purposes.

The baseline questionnaire learner responses consisted of Xhosa, English, and Afrikaans Home Language learners. The three files were appended, and both the Xhosa and Afrikaans Home Language were converted into English for ease of analysis. The same process was employed with the endline questionnaire. Whilst there were Xhosa responses in the baseline, there were none in the endline due to the none-availability of the linking variables.

In the end, the merging of the endline to the baseline questionnaire determined who to include in the analysis. The final dataset of the two questionnaires consisted of 451 learners each, with some of the learners having missing demographics and responses.

When the Grade 12 end-of-year results were received, the school EMIS number was used to identify the participating learners. The findings of the intervention are presented in Section 4.

3.2 Limitations

Usually, learner registers are used to keep track of the learners who attend the GM sessions. This makes it easy to separate learners who attended and those that did not. It also gives one a guarantee that the learners really made time and interacted with the videos and giving one confidence that gains were because of the exposure to the intervention. With only the baseline and endline learner responses, one cannot confidently say learners interacted with the materials and if they interacted with them; the amount of time they spent is also not guaranteed.

Added to this, the lifespan of the intervention is about six months. Differently, the baseline was administered in June and the endline in October, a space of about three months. The short period might not be enough for significant results pre- and post- intervention.

4. Results

4.1 Participation by school and number of learners

The primary beneficiaries of the GM intervention were all Grade 12 learners in ordinary public schools. Eighty ordinary public schools responded to the baseline questionnaire with 5 322 learners. Thirty-nine schools responded to the endline questionnaire with 2 068 learners. Due to incomplete data, only 13 schools with 451 learners were included in the analysis.

4.2 Participation by demographic background

Table 1: Participation by age, gender and Language of Learning and Training (LoLT)

Parameter	Grouping	Number of learners	% of learners
Age	Younger than 18	110	24,6
	18 years	216	48,3
	Older than 18 years	121	27,1
Gender	Boys	203	45,0
	Girls	248	55,0
LOLT	Afrikaans	240	53,2
	English	211	46,8

Table 1 is a presentation of the Grade 12 learners who completed the baseline and endline questionnaire grouped by age, gender and LoLT. From Table 1:

- Whilst there were 451 learners with both the baseline and endline questionnaires, four did not have the age information. Of the 447 with age information, the majority were 18 years, 216 or 48,3%. There were marginal differences between the younger and older learners with the younger learners contributing 110 or 24,6% and the older group contributing 121 or 27,1% towards the total participants.
- There were more girls compared to boys, 248 or 55%, and more than 50% of the learners were taught in Afrikaans, 240 or 53,2%. The rest were taught in English.

Table 2: Participation by geographical location

Grouping variable	Grouping	Number of learners	% of learners
Education district	Metro East	44	9,8
	Metro North	42	9,3
	Cape Winelands	87	19,3
	Eden & Central Karoo	171	37,9
	Overberg	26	5,8
	West Coast	81	18,0
NQ	NQ1	64	14,2
	NQ2	38	8,4
	NQ3	80	17,7
	NQ4	97	21,5
	NQ5	172	38,1

Table 2 is a presentation of the Grade 12 learners with responses to both questionnaires clustered by education district and NQ. From Table 2:

- Participation was popular in the rural districts with Eden and Central Karoo having 171 or 37,9% learners, followed by the Cape Winelands and West Coast district contributing 87 or 19,3% and 81 or 18% towards the total participating learners respectively. The Overberg district had the least number of learners, 26 or 5,8%.
- The two Metropole districts with participating schools had less than 10% of learners each, 44 or 9,8% in Metro East and 42 or 9,3% in Metro North.
- Participation also varied by NQ with more than a third of the learners, 172 or 38,1% attending schools situated in affluent areas, followed by NQ 4 schools, 97 or 21,5%.

4.3 GM of the Grade 12 learners by age group

4.3.1 Learners younger than 18 years

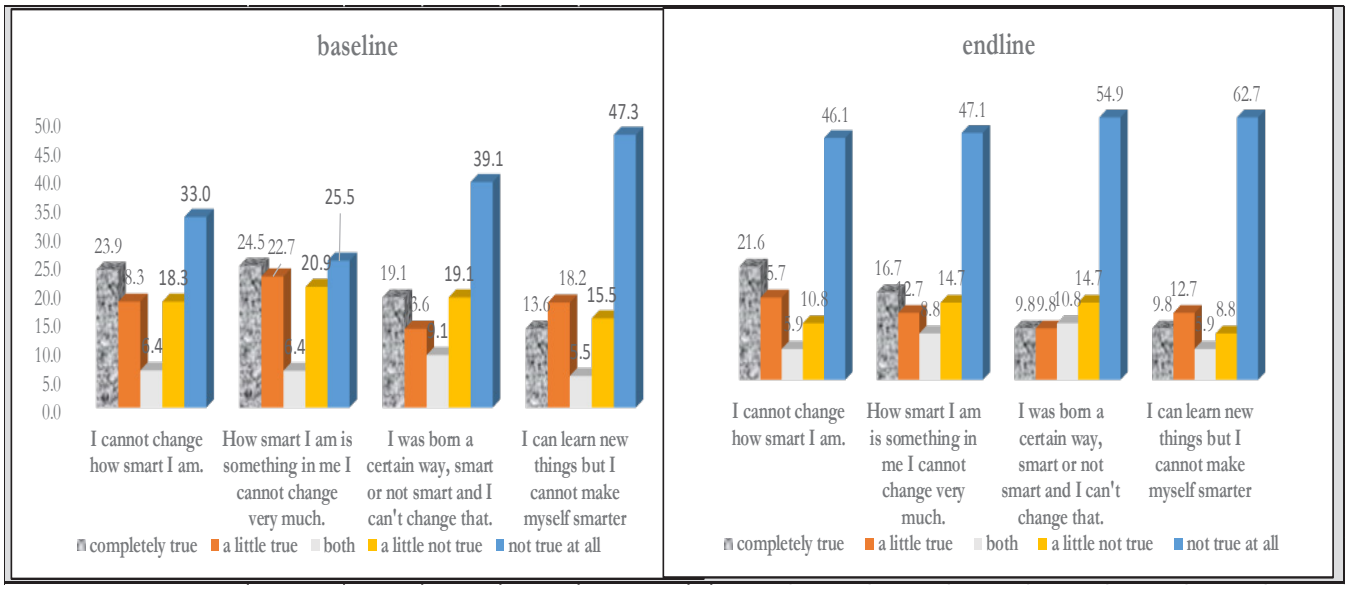

Figure 1: baseline and endline proportions for younger than 18-years-old learners

Figure 1 is a presentation of the younger than 18-year-old Grade 12 learner responses to both questionnaires. 110 or 24,6% learners were younger than18 years. From Figure 1:

- The responses of the baseline and endline questionnaire follow the same trend with the majority of the younger than 18-years-olds having a growth mindset.
- In the baseline questionnaire, the learner responses are inconclusive in as far as thinking that their smartness is something they cannot change with 24,5% learners supporting the claim compared to the 25,5% disagreeing with it. The younger than 18-year-old learners seem to have categorically shifted towards a growth mindset after the intervention, with 16,7% supporting the claim compared to 47,1% in disagreement.

Table 3: Summary statistics of the responses of the younger than 18-year-old Grade 12 learners

Parameters for under 18's	Cycle	I cannot change how smart I am.	How smart I am is something in me that I cannot change very much.	I was born a certain way, smart or not smart, and I can't change that.	I can learn new things, but I cannot make myself smarter.
GM index ($\bar{x}$)	baseline	3,18	3,00	3,45	3,65
	endline	3,44	3,63	3,95	4,02
Standard deviation (s)	baseline	1,623	1,568	1,572	1,542
	endline	1,569	1,572	1,623	1,640
significance level(p-value)		0,320	0,004	0,118	0,207

Table 3 is a presentation of the younger than 18-year-old Grade 12 learner responses to the GM questionnaire before and after exposure to the intervention. From Table 3:

- There are marginal differences when the indices are compared.
- The average GM index of the younger than18-year-old learners is 3,32 before exposure and 3,76 after exposure to the intervention. Both indices exceed the 2017 pilot index of 2,94.
- The difference is statistically different only for the claim "How smart I am is something in me I cannot change very much" with $t_{(207)} = -0,627$, $p=0,004<0,05$ at the 5% significant level; an indication that the learner perceptions changed towards a growth mindset after the intervention.

4.3.2 18-year-old learners

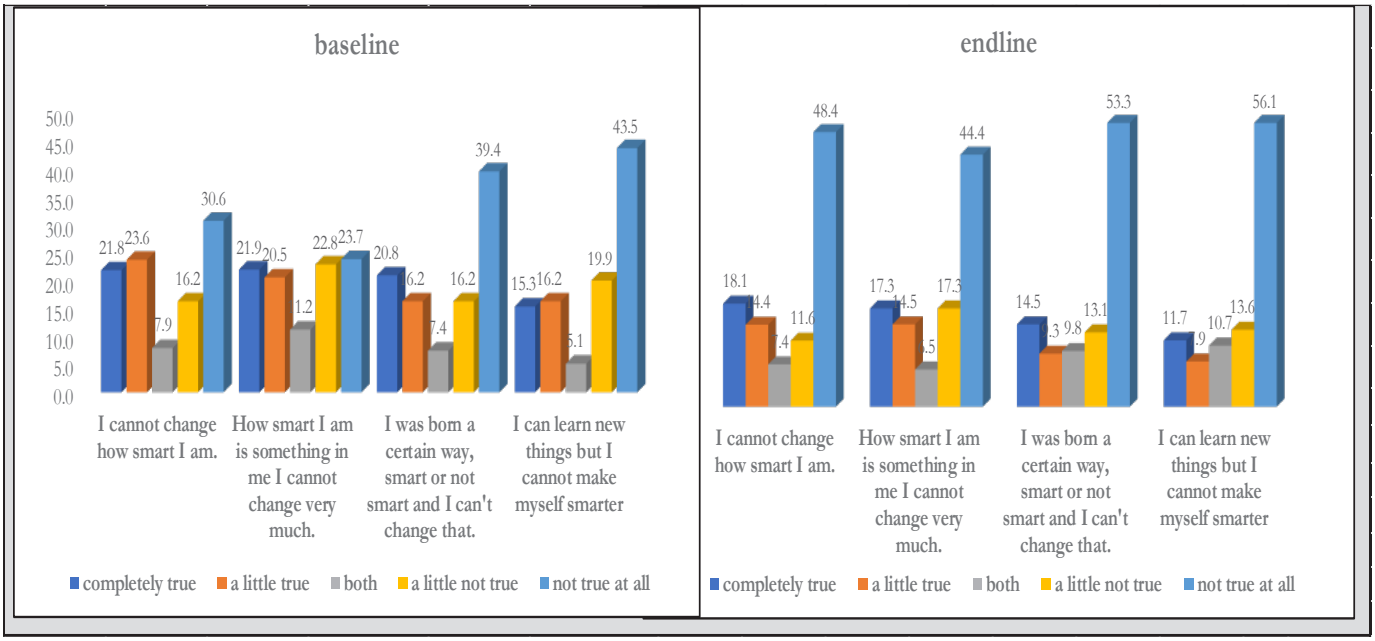

Figure 2: baseline and endline proportions for 18-year-old learners

Figure 2 is a presentation of the 18-year-old Grade 12 learner responses to both questionnaires. A total of 216 or 48,3% of the learners were 18-years-old learners. From Figure 2:

- The responses of the baseline and endline questionnaire follow the same trend with many of the 18-year-old learners having a growth mindset.
- In the baseline, the learner responses are inconclusive in as far as thinking that their smartness is something they cannot change: 21,9% of the learners support the claim compared to the 23,7% disagreeing with it. The 18-year-old learners seem to have categorically shifted towards a growth mindset after the intervention – 17,3% supporting the claim compared to 44,4% in disagreement.

Table 4: Summary statistics of the responses of the 18-year-old Grade 12 learners

Parameters for 18-year-olds.	Cycle	I cannot change how smart I am.	How smart I am is something in me I cannot change very much.	I was born a certain way, smart or not smart, and I can't change that.	I can learn new things, but I cannot make myself smarter.
GM index ($\bar{x}$)	baseline	3,10	3,06	3,37	3,60
	endline	3,58	3,57	3,81	3,94
Standard deviation (s)	baseline	1,579	1,504	1,614	1,537
	endline	1,613	1,572	1,511	1,43
significance level(p-value)		0,002	0,001	0,004	0,017

Table 4 is a presentation of the Grade 12 learner responses to the GM questionnaire before and after exposure to the intervention. From Table 4:

- There are observable differences when the indices are compared.
- The average GM index of the 18-year-olds is 3,28 before exposure and 3,73 after exposure to the intervention. Both indices exceed the 2017 pilot index of 2,94.
- The results show a significant improvement between the baseline and endline for this age group as all the p-values are less than 0,05 at the 5% significant level, an indication that whilst many of the learners have a positive mindset, more learners acquired a growth mindset after the intervention.

4.3.3 Over 18-year-old learners

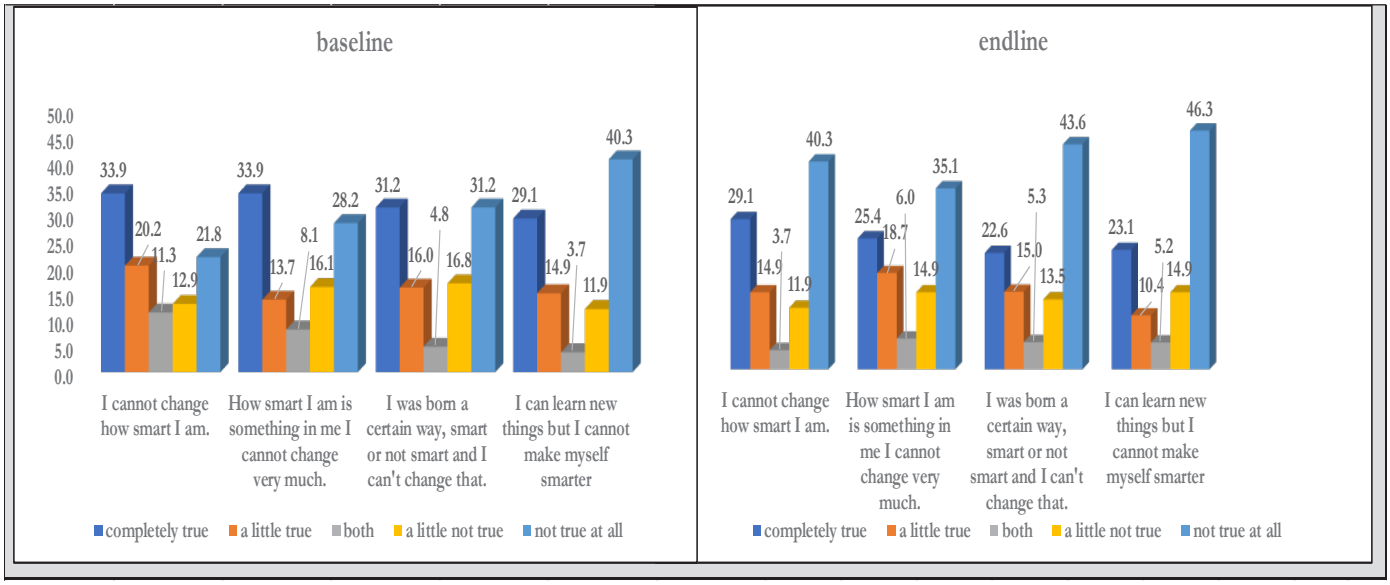

Figure 3: baseline and endline proportions for over 18-year-old learners

Figure 3 is a presentation of the over 18-year-old Grade 12 learner responses to both questionnaires. A total of 121 or 27,1% of the learners were over 18 years. From Figure 3:

- The responses of the baseline and endline questionnaire follow the same trend with most of the over 18-year-old learners having a growth mindset.
- In the baseline, the learner responses are inconclusive in as far as thinking that their smartness is something they cannot change with 33,9% learners supporting the claim compared to the 28,2% disagreeing with it. The over 18-year-old learners seem to have categorically shifted towards a growth mindset after the intervention, with 25,4% supporting the claim compared to 35,1% in disagreement.

Table 5: Summary statistics of the responses of the over 18-year-old Grade 12 learners

Parameters for over 18's	Cycle	I cannot change how smart I am.	How smart I am is something in me I cannot change very much.	I was born a certain way, smart or not smart and I can't change that.	I can learn new things, but I cannot make myself smarter.
GM index ($\bar{x}$)	baseline	2,79	2,68	2,91	3,01
	endline	3,19	3,16	3,41	3,51
Standard deviation (s)	baseline	1,603	1,574	1,672	1,687
	endline	1,741	1,658	1,67	1,671
significance level(p-value)		0,055	0020	0,018	0,017

Table 5 is a presentation of the over 18-year-old Grade 12 learner responses to the GM questionnaire before and after exposure to the intervention. From Table 5:

- There are marginal differences when the baseline and endline indices are compared.
- The average GM index of the over 18-year-olds is 2,85 before exposure and 3,32 after exposure to the intervention. While the index before the intervention is smaller than 2,94, the endline index exceeds the 2,94 of the 2017 pilot index.
- The results show significant improvements between the baseline and endline for the older learners in the following:
    - The older learners believe how smart they are is something they can change with p=0,020<0,05 at the 5% significance level.
    - The older learners do not believe that they were born a certain way, smart or not smart, and can't change that with p=0,018<0,05 at the 5% significance level.
    - The older learners believe they can be smarter with p=0,017<0,05 at the 5% significance level.
- The results were insignificant as far as the first claim is concerned as the older learners believed they cannot change how smart they are even after the intervention, p-0,05>0,05.

4.4 GM of the Grade 12 learners by gender

4.4.1 Boys

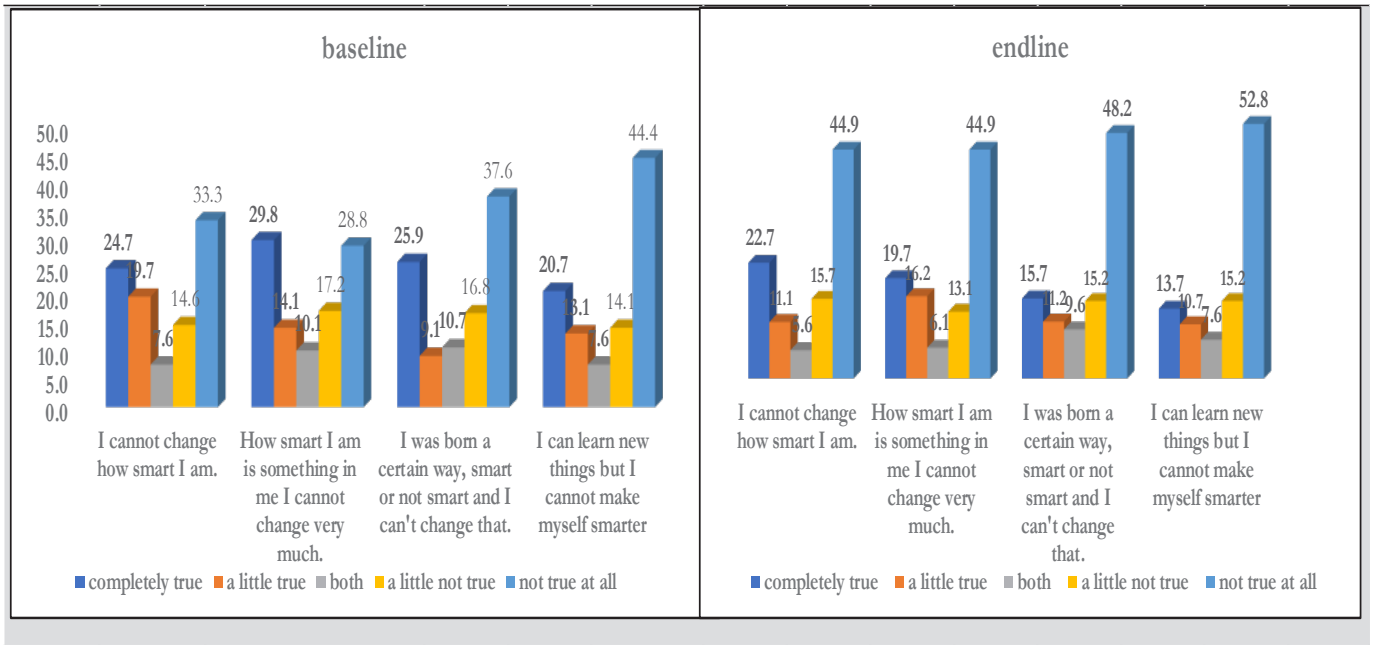

Figure 4: baseline and endline proportions for boys

Figure 4 is a presentation of the Grade 12 boys' responses to both questionnaires. A total of 203 or 45% of the learners were boys. From Figure 4:

- The responses of the baseline and endline questionnaire follow the same trend when the baseline and endline responses are compared.
- In the baseline, the learner responses are inconclusive in as far as thinking that their smartness is something they cannot change with 29,8% of the boys supporting the claim compared to the 28,8% disagreeing with it. The boys seem to have categorically shifted towards a growth mindset after the intervention – 19,7% supporting the claim compared to 44,9% in disagreement.

Table 6: Summary statistics of the responses of the Grade 12 boys

Parameters for boys	Cycle	I cannot change how smart I am.	How smart I am is something in me I cannot change very much.	I was born a certain way, smart or not smart, and I can't change that.	I can learn new things, but I cannot make myself smarter.
GM index ($\bar{x}$)	baseline	3,12	3,01	3,31	3,46
	endline	3,45	3,45	3,69	3,82
Standard deviation (s)	baseline	1,633	1,634	1,648	1,63
	endline	1,658	1,633	1,535	1,499
significance level(p-value)		0,026	0,005	0,018	0,030

Table 6 is a presentation of the Grade 12 learner responses to the GM questionnaire before and after exposure to the intervention. From Table 6:

- There are marginal differences when the baseline and endline indices are compared.

- The average GM index of the boys is 3,23 at the baseline and 3,60 at the endline. Both indices exceed the 2017 pilot index of 2,94.
- The results show significant improvements between the baseline and endline for boys as all the p-values are smaller than 0,05 at the 5% significant level, an indication that whilst many of the boys have a positive mindset, this number increased after the intervention.

4.4.2 Girls

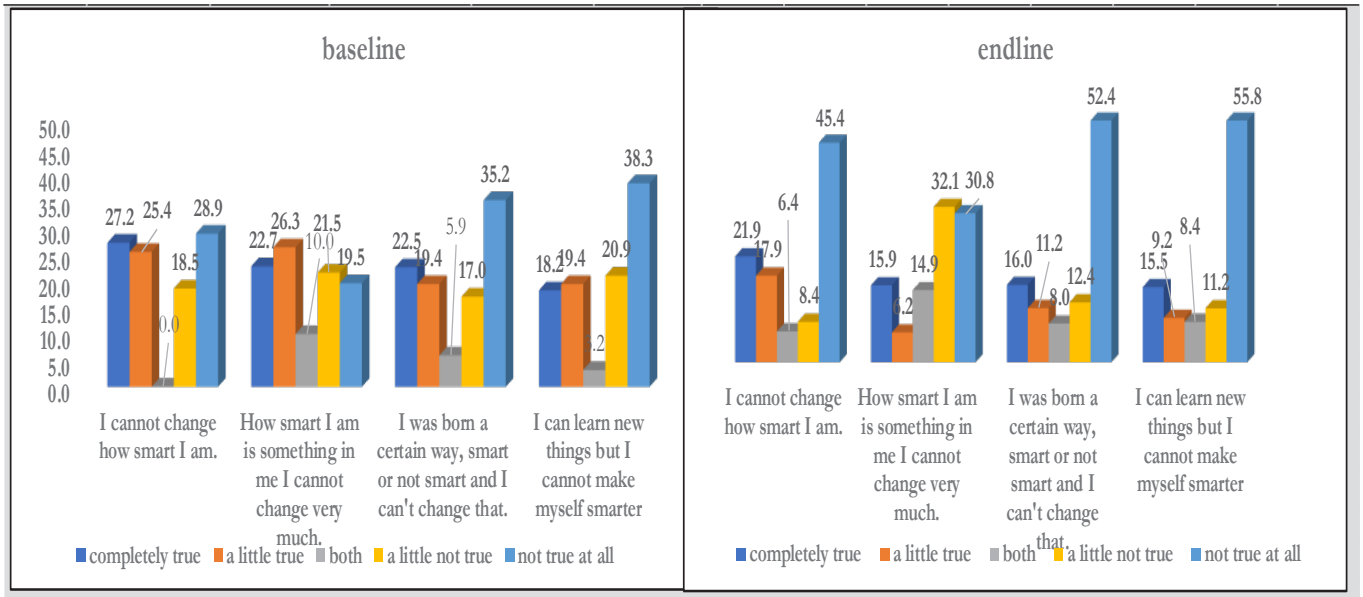

Figure 5: baseline and endline proportions for girls

Figure 5 is a presentation of the Grade 12 girls' responses to both questionnaires. A total of 245 or 55% of the learners were girls. From Figure 5:

- The responses of the baseline and endline questionnaire follow the same trend when the baseline and endline responses are compared.
- In the baseline, the learner responses are inconclusive in as far as thinking that their smartness is something they cannot change with 22,7% girls supporting the claim compared to the 19,5% disagreeing with it. The girls seem to have categorically shifted towards a growth mindset after the intervention with 15,9% supporting the claim compared to 30,8% in disagreement.

Table 7: Summary statistics of the responses of the Grade 12 girls

Parameters for girls	Cycle	I cannot change how smart I am.	How smart I am is something in me I cannot change very much.	I was born a certain way, smart or not smart, and I can't change that.	I can learn new things, but I cannot make myself smarter.
GM index ($\bar{x}$)	baseline	2,97	2,89	3,23	3,42
	endline	3,37	3,54	3,74	3,83
Standard deviation (s)	baseline	1,570	1,471	1,622	1,581
	endline	1,681	1,587	1,56	1,544
significance level(p-value)		0,005	0,000	0,000	0,030

Table 7 is a presentation of the Grade 12 learner responses to the GM questionnaire before and after exposure to the intervention. From Table 7:

- There are observable differences when the baseline and endline indices are compared.
- The average GM index of the girls is 3,13 at the baseline and 3,62 at the endline. Both indices exceed the 2017 pilot index of 2,94.
- The results show significant improvements between the baseline and endline for girls as all the p-values are smaller than 0,05 at the 5% significant level, an indication that whilst many of the girls have a positive mindset, this number increased after the intervention.

4.5 GM of Grade 12 learners by NQ

4.5.1 NQ 1

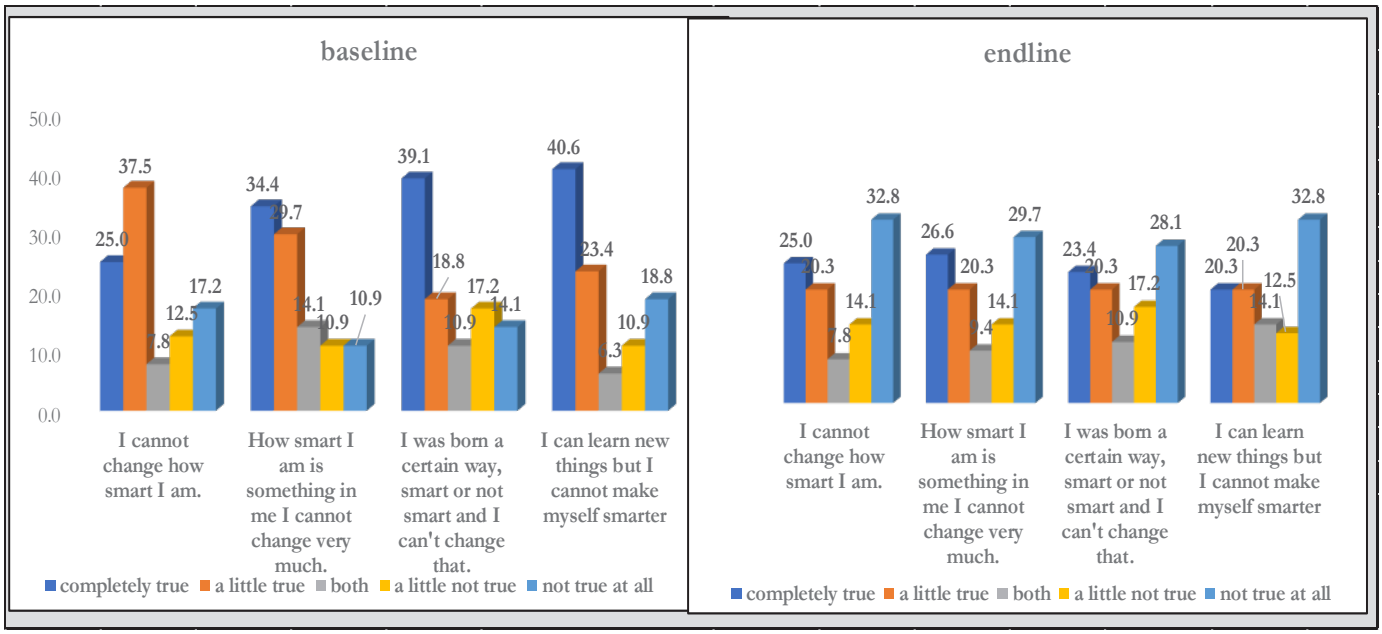

Figure 6: baseline and endline proportions for NQ1

Figure 6 is a presentation of the NQ1 Grade 12 learner responses to both questionnaires. A total of 64 or 14,2% learners were from NQ1. From Figure 6:

- In the baseline, many of the NQ1 learners have a fixed mindset.
- Whilst there is a reduction in the number of learners with a fixed mindset, the perceptions of many of the NQ1 learners did not change much after the intervention.

Table 8: Summary statistics of the responses of the Grade 12 NQ1 learners

Parameters for NQ1	Cycle	I cannot change how smart I am.	How smart I am is something in me I cannot change very much.	I was born a certain way, smart or not smart, and I can't change that.	I can learn new things, but I cannot make myself smarter.
GM index ($\bar{x}$)	baseline	2,59	2,34	2,48	2,44
	endline	3,09	3,00	3,06	3,17
Standard deviation (s)	baseline	1,433	1,348	1,501	1,562
	endline	1,569	1,572	1,623	1,64
significance level(p-value)		0,069	0,014	0,035	0,009

Table 8 is a presentation of the NQ1 statistics generated from the Grade 12 learner responses to the GM questionnaire before and after exposure to the intervention. From Table 8:

- There are marginal differences when the baseline and endline indices are compared.
- The average GM index of the NQ1 learners is 2,46 at the baseline and 3,08 at the endline. The endline index exceeds the 2017 pilot index of 2,94.
- The results show significant improvements between the baseline and endline for the NQ1 learners in the following:
    - The NQ1 learners believe how smart they are is something they can change with p=0,014<0,05 at the 5% significance level.
    - The NQ1 learners do not believe that they were born a certain way, smart or not smart, and can't change that with p=0,035<0,05 at the 5% significance level.
    - The NQ1 learners believe they can be smarter with p=0,009<0,05 at the 5% significance level.
- The results were insignificant in as far as the first claim is concerned as the NQ1 learners believed they cannot change how smart they are even after the intervention.

4.5.2 NQ 2

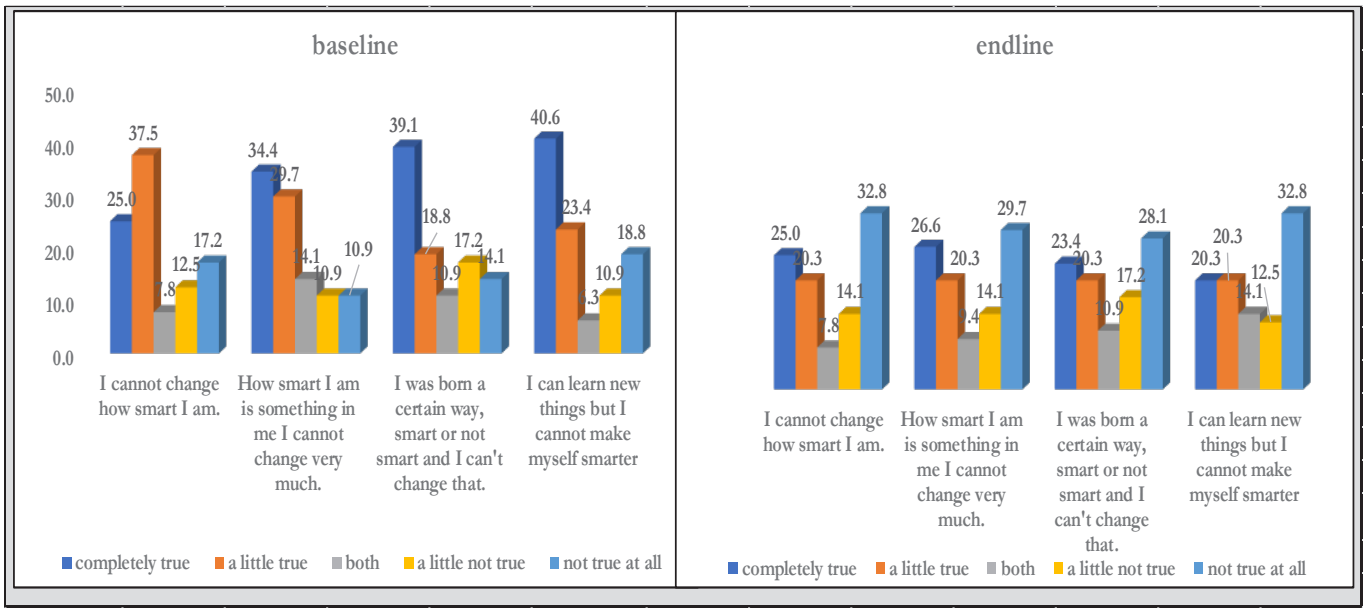

Figure 7: baseline and endline proportions for NQ2

Figure 7 is a presentation of the Grade 12 learner responses to both questionnaires. A total of 38 or 8,4% learners were from NQ2. From Figure 7:

- In the baseline, many of the NQ2 learners have a fixed mindset.
- Whilst there is a reduction in the number of learners with a fixed mindset, the perceptions of many of the NQ2 learners did not change much after the intervention.

Table 9: Summary statistics of the responses of the Grade 12 NQ2 learners

Parameters for NQ2	Cycle	I cannot change how smart I am.	How smart I am is something in me I cannot change very much.	I was born a certain way, smart or not smart, and I can't change that.	I can learn new things, but I cannot make myself smarter.
GM index ($\bar{x}$)	baseline	2,84	2,66	3,05	3,00
	endline	4,89	4,89	4,92	4,92
Standard deviation (s)	baseline	1,436	1,419	1,469	1,708
	endline	0,641	0,641	0,48	0,48
significance level(p-value)		0,000	0,000	0,000	0,000

Table 9 is a presentation of the NQ2 statistics generated from Grade 12 learner responses to the GM questionnaire before and after exposure to the intervention. From Table 9:

- There are observable differences when the baseline and endline indices are compared.
- The average GM index of the NQ2 learners is 2,89 at the baseline and 4,90 at the endline. The endline index exceeds the 2017 pilot index of 2,94.
- The results show significant improvements between the baseline and endline for the NQ2 learners as all the p-values are smaller than 0,05 at the 5% significant level, an indication that there was a mindset shift towards a growth mindset after the intervention.

4.5.3 NQ 3

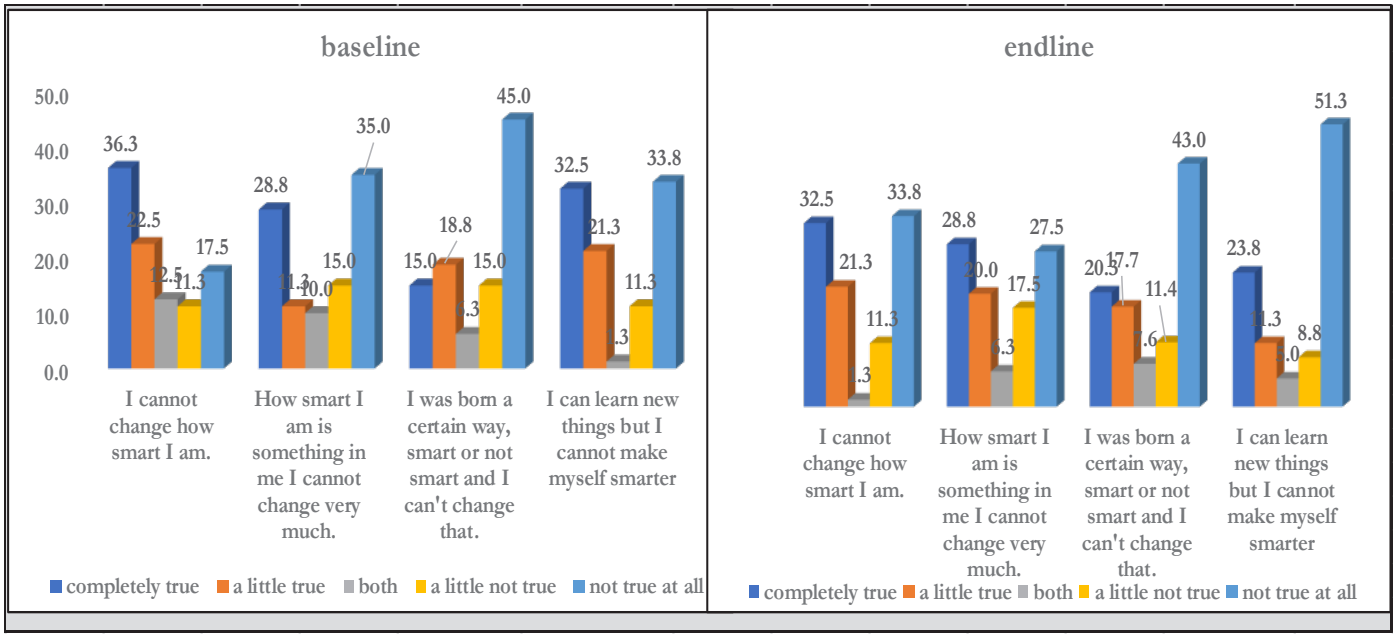

Figure 8: baseline and endline proportions for NQ3

Figure 8 is a presentation of the NQ3 Grade 12 learner responses to both questionnaires. A total of 80 or 17,7% learners were from NQ3. From Figure 8:

- In the baseline, the responses of the NQ3 learners are inconclusive for some of the claims. Some suggest a fixed mindset whilst some suggest a growth mindset.
- Whilst there is a reduction in the number of learners with a fixed mindset, the perceptions of many of the NQ3 learners did not change much after the intervention.

Table 10: Summary statistics of the responses of the Grade 12 NQ3 learners

Parameters for NQ3	Cycle	I cannot change how smart I am.	How smart I am is something in me I cannot change very much.	I was born a certain way, smart or not smart, and I can't change that.	I can learn new things, but I cannot make myself smarter.
GM index ($\bar{x}$)	baseline	2,66	2,51	3,16	3,56
	endline	2,95	2,95	3,39	3,53
Standard deviation (s)	baseline	1,698	1,509	1,68	1,566
	endline	1,734	1,63	1,644	1,721
significance level(p-value)		0,335	0,080	0,385	0,886

Table 10 is a presentation of the NQ3 statistics generated from Grade 12 learner responses to the GM questionnaire before and after exposure to the intervention. From Table 10:

- There are marginal differences when the baseline and endline indices are compared.
- The average GM index of the NQ3 learners is 2,97 at the baseline and 3,21 at the endline. The indices exceed the 2017 pilot index of 2,94.
- The results show no significant improvements between the baseline and endline for the NQ3 learners as all the p-values are greater than 0,05 at the 5% significant level, an indication that the mindset of many NQ3 did not shift or improve that much after the intervention.

4.5.4 NQ 4

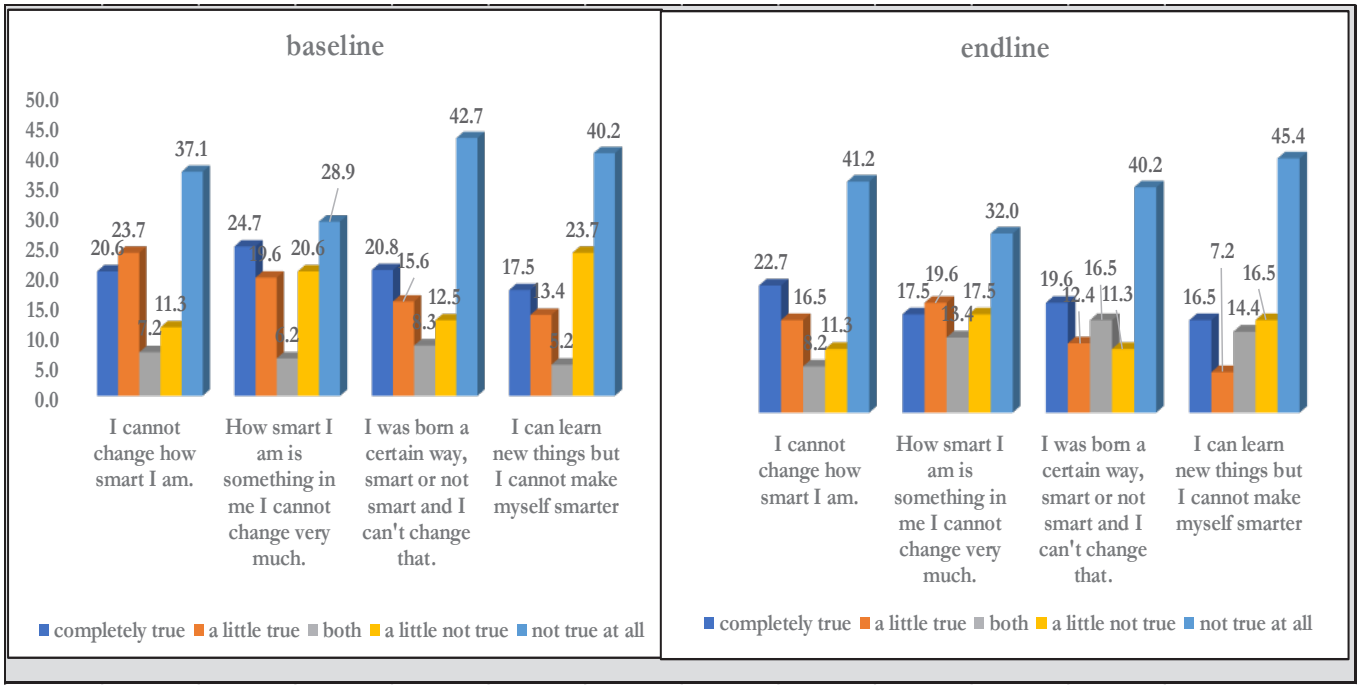

Figure 9: baseline and endline proportions for NQ4

Figure 9 is a presentation of the Grade 12 learner responses to both questionnaires. A total of 97 or 21,5% learners were from NQ4. From Figure 9:

- The responses of the learners follow the same trend before and after the intervention and suggest that many NQ4 learners have a growth mindset.

Table 11: Summary statistics of the responses of the Grade 12 NQ4 learners

Parameters for NQ4	Cycle	I cannot change how smart I am.	How smart I am is something in me I cannot change very much.	I was born a certain way, smart or not smart, and I can't change that.	I can learn new things, but I cannot make myself smarter.
GM index ($\bar{x}$)	baseline	3,21	3,09	3,70	3,56
	endline	3,32	3,27	3,40	3,67
Standard deviation (s)	baseline	1,626	1,601	1,639	1,548
	endline	1,662	1,517	1,579	1,512
significance level(p-value)		0,632	0,435	0,986	0,606

Table 11 is a presentation of the NQ4 statistics generated from Grade 12 learner responses to the GM questionnaire before and after exposure to the intervention. From Table 11:

- There are marginal differences when the baseline and endline indices are compared.
- The average GM index of the NQ4 learners is 3,39 at the baseline and 3,42 at the endline. The indices exceed the 2017 pilot index of 2,94.
- The results show no significant improvements between the baseline and endline for NQ4 learners as all the p-values are greater than 0,05 at the 5% significant level, an indication that the mindset of the learners did not shift or improve that much after the intervention.

4.5.4 NQ 5

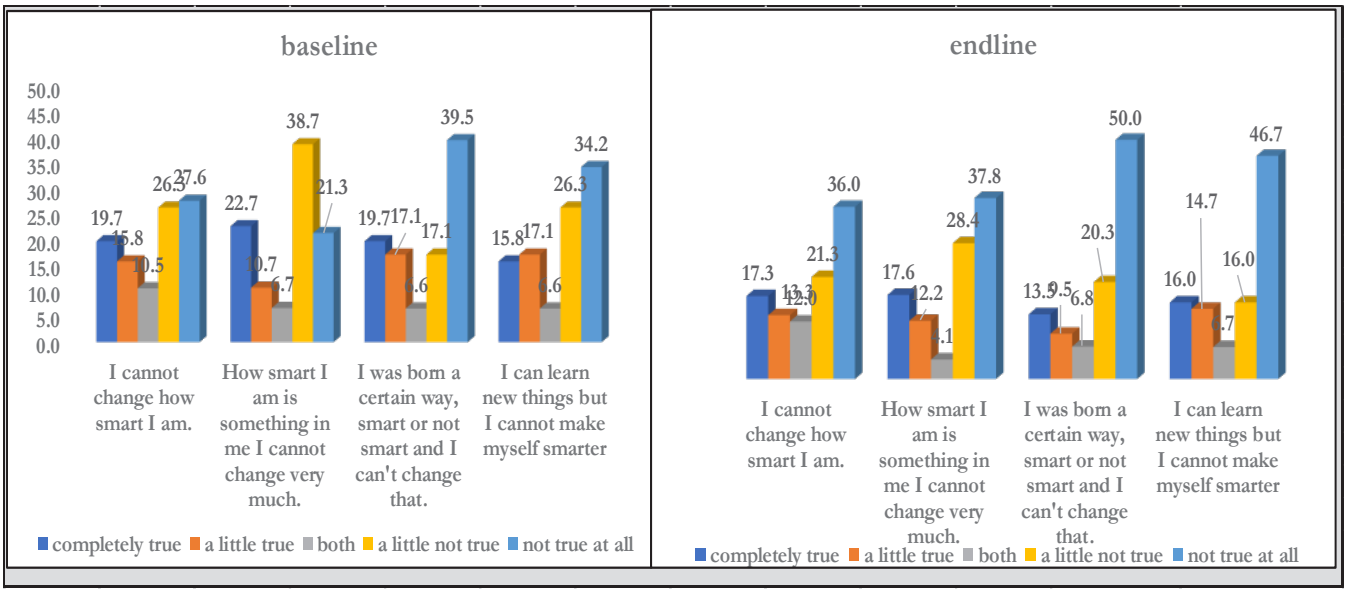

Figure 10: baseline and endline proportions for NQ5

Figure 10 is a presentation of the Grade 12 learner responses to both questionnaires. A total of 172 or 38,1% learners were from NQ5. From Figure 10:

- The responses of the learners are almost similar before and after the intervention, suggesting that many of the NQ5 learners have a growth mindset.

Table 12: Summary statistics of the responses of the Grade 12 NQ5 learners

Parameters for NQ5	Cycle	I cannot change how smart I am.	How smart I am is something in me I cannot change very much.	I was born a certain way, smart or not smart, and I can't change that.	I can learn new things, but I cannot make myself smarter.
GM index ($\bar{x}$)	baseline	3,26	3,25	3,39	3,46
	endline	3,45	3,57	3,83	3,63
Standard deviation (s)	baseline	1,509	1,49	1,609	1,501
	endline	1,518	1,527	1,471	1,566
significance level(p-value)		0,814	0,228	0,456	0,480

Table 12 is a presentation of the NQ5 statistics generated from the Grade 12 learner responses to the GM questionnaire before and after exposure to the intervention. From Table 12:

- There are marginal differences when the baseline and endline indices are compared.
- The average GM index of the NQ5 learners is 3,34 at the baseline and 3,62 at the endline. The indices exceed the 2017 pilot index of 2,94.
- The results show no significant improvements between the baseline and endline for NQ5 learners as all the p-values are greater than 0,05 at the 5% significant level, an indication that the mindset of most of the learners did not shift or improve that much after the intervention.

4.6 Impact on Learning Outcomes

Individuals with a growth mindset tend to be more open to challenges, know that hard work has benefits and are also open to criticism (Cook et.al., 2017). This section uses the NQ and NSC overall results of the 2020 Grade 12 cohort to see whether there are correlations between the growth mindset of the learners and their performance. The results are limited to the 13 participating schools. The assumption is that learners with a strong growth mindset will do better compared to learners who have not yet accumulated a growth mindset.

4.6.1 Overall NSC performance

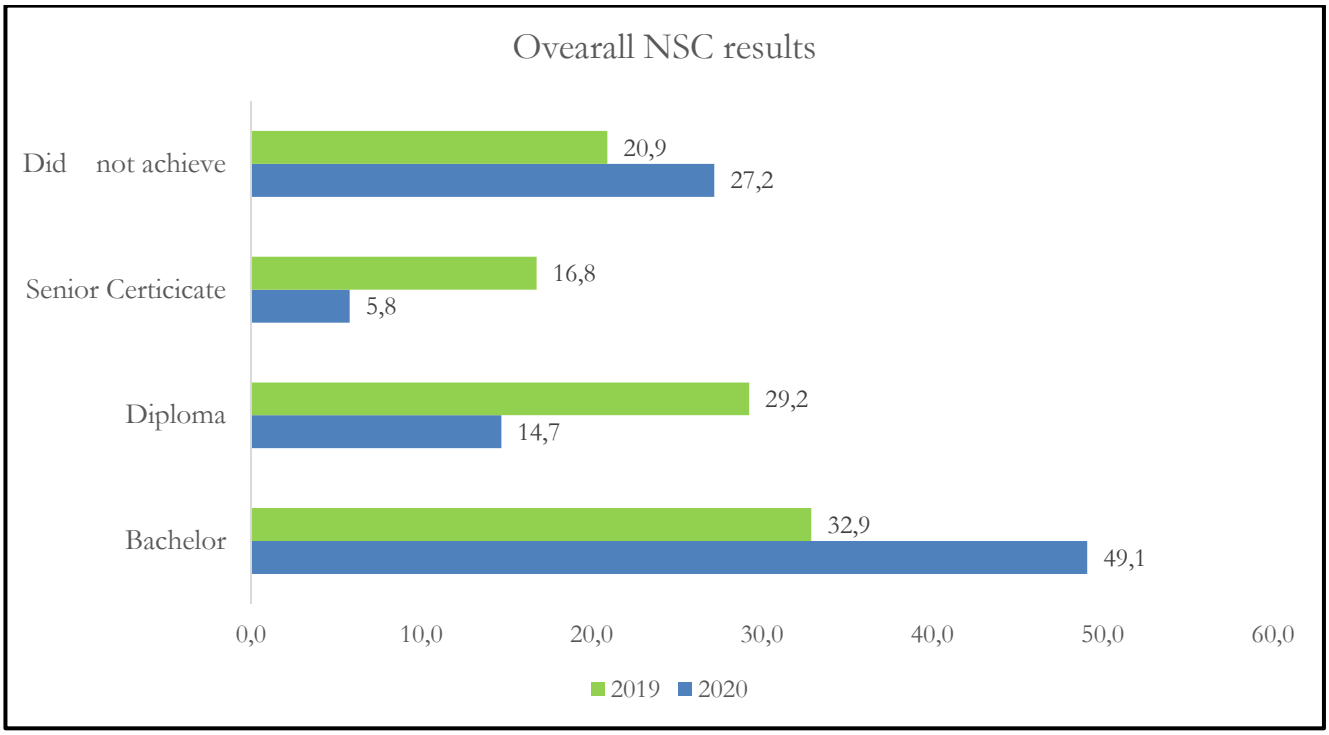

Figure 11: Overall NSC results

Figure 11 is a presentation of the overall NSC results for the schools with both questionnaires. From Figure 11:

- The proportion of learners obtaining quality passes or bachelor's passes improved by 16,2% in 2020.
- Similarly, the proportion of learners who did not achieve increased by 6,3% in 2020.
- More learners passed Grade 12 in 2019 compared to 2020.
- Similarly, more learners obtained diplomas in 2019 compared to 2020.

4.6.2 Extent of dropout rate between the second and third quarter

Table 13: 2019 and 2020 Grade 12 dropout rate

Month	Gr. 12 learners	2019 difference	2020 difference
Jun-19	1518	-9	-47
Jun-20	1783		
Dec-19	1509		
Dec-20	1736		

Table 13 is a presentation of the Grade 12 learner enrolments between June and December comparing 2019 to 2020. From Table 13:

- More learners were lost in 2020 compared to 2019. However, the difference in learner losses is not statistically significant when the comparison between the two years is done.

5. Conclusion

5.1 Data quality

Data quality is a challenge that needs to be addressed as the results might have been different if the data was complete. Incomplete data is a risk for information that must be used to inform decisions.

5.2 Participation by number of schools and learners

Participation is low as only six out of the eight education districts participated. Also, about 50% of the schools and learners that submitted the baseline questionnaire submitted the endline, a reason for concern. The participation rate is crucial as it adds confidence that the findings of the study can be generalised.

Another concern is the unavailability of attendance registers or login information which could serve as evidence that the learners really interacted with the materials. The completion of the baseline and endline questionnaires is not sufficient proof that learners engaged the materials.

5.3 GM Index

The GM intervention takes three full months. The invitation to schools was sent on 24 June 2020. The mindset of the learners has improved for the better since the pilot in 2017. It also significantly improved when the baseline is compared to the endline.

5.3.1 Variance by Age

The results suggest that there is variance by age.

- The **younger** and **older learners** believed they can change how smart they are before the intervention. This belief did not change that much after the intervention.

  This is not surprising as previous studies have shown that it might be harder to change those beliefs if they are already high.

- There is strong evidence suggesting that the intervention worked for the 18-year-old learners. Whilst the GM index of these learners was 3,28 before the intervention, it increased significantly to 3,73 after the intervention.

This is confirmation that the policy for learners to start school at the age of 7 and finish schooling at 18 is not a wrong judgement. This further encourages the system to strengthen processes at the earlier phases so that learners have a good foundation and further reach and complete Grade 12 at the appropriate age.

5.3.2 Variance by Gender

The results suggest that there is no variance by gender.

Both **boys** and **girls** were impacted positively by the intervention and all the results were statistically significant when the baseline was compared to the endline.

This raises hope as the exposure of girls to this intervention might motivate the girl child to forget about all the limiting constraints and stereotypes that women have limited abilities. Hopefully it will motivate girls to focus more on their studies as it is more difficult to survive for an uneducated woman than it is for the opposite sex.

5.3.3 Variance by NQ

The results suggests that there is variance by wealth.

About 21% of Western Cape population is considered poor as suggested by the Lower Bound Poverty Line (Stats SA, 2020). Research shows that poverty influences the learning process, amongst many other factors (Parrett and Badge, 2016). In addition, learners from poor communities usually do not think they have the potential to succeed. The intervention findings do not contradict these claims as:

- The majority of NQ1 and NQ2 learners had a fixed mindset before the intervention as suggested by the results and shifted towards a growth mindset after the intervention. However, for NQ1 learners, there were no significant improvements in claim 1 as the perceptions remained the same.

This raises hope as learners from this quintile might be influenced to forget about all the limiting constraints because of their poor background and focus more on how they can overcome them through hard work and belief that they can be better people and lead wonderful lives as well.

- NQ3, NQ4 and NQ5 learners who had a growth mindset before the intervention were not impacted after exposure as their perceptions did not change, supporting the existing literature that it is difficult to change opinions that are already strong with little to no chances of improving.

5.4 Impact on overall performance and learner dropout rate

- It was not easy to assess the impact of the intervention on the performance by age due to missing unique learner identity numbers.
- The results are inconclusive as more learners failed in 2020 compared to 2019 whilst there were also more quality passes in 2020 compared to 2019. Also, many learners were lost in 2020 compared to 2019 although the losses in both years were not significant.

5.5 Qualitative findings

To gauge the impact of the GM intervention on learners' behaviour, attitude and mindset in their real learning environment, a sample of schools was selected to respond to the following two questions:

1. Have you observed any difference in the attitude, mindset, and behaviours of the learners? If yes, please provide an example.
2. Was there a difference in the learners' general levels of commitment? If yes, what actions of theirs indicated the aforementioned?

The responses were analysed, and the following findings are evident from the feedback received:

A difference in the attitude, mindset, behaviour, and commitment of learners has been experienced, both during and after the intervention. Positive trends have been observed, inclusive of cognitive and behavioural presentation and work ethic of learners.

Significant improvement in learners' level of commitment has been observed i.e., their work ethic, their school attendance, participation in extra lessons, completion of School-Based Assessment tasks and their engagement in online classes.

*In addition to noting enhancements in learner subject matter, performance schools also reported reduction in late coming as well. This is indicative of a cohesive and strong sense of resilience to persevere throughout 2020, amidst and despite a pandemic and lockdown.

With continuous and conscious targeted efforts in engaging learners in the GM intervention, it has been proven that considerable progress in various capacities can be attained that will further highlight the value of and enhance the implementation of GM.

* Specifically, a sampled school reported more than 90% attendance of both extra classes and the winter school programmes offered to learners.

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