

Tracking student well-being with SMC-SMILE (School-based Monitoring of Internal Learning Effects)

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Abstract. Due to the abrupt shift to online modalities, teachers and management must be more perceptive to the needs of students as conventional support systems are inaccessible online. This paper documents SMC-SMILE (School-based Monitoring of Internal Learning Effects), an action research implemented from January to April 2021. During the program, advisers deployed a short-form survey that measured academic anxiety and noted the perceived subject with most negative feelings during weekly homeroom/SCALE sessions. Weekly reports were forwarded to batch teachers, and monthly institutional reports were prepared for administrators and teachers. While academic anxiety scores did not decrease over time because of the program, several notable findings were generated. Academic anxiety scores increased throughout a quarter, peaking during exam weeks; scores reset after a mental health break at the end of a quarter. Several teachers noted results in weekly reports and altered instructional design or implemented interventions such as batch consultations. The survey and the reports appeared to have served as a reflective tool for teaching. Overall, while the program itself may not have decreased academic anxiety scores on its own, it may prove as a good model for future concerted efforts in improving student well-being within the campus or beyond.

Introduction

SMC-SMILE (School-based Monitoring of Internal Learning Effects) was a 16-week program (from January to April, 2021) that sought to actively integrate monitoring of student well-being in the delivery of instruction, not only at the adviser level but also at a school-wide scope. Due to the experimental conditions in the online learning setup, there is a deep need for teachers to first know of context: as subject teachers interact with their students mostly exclusively in their own classes, teachers may not be aware of the holistic state of their students especially as they do not understand the demands of other subjects. SMC-SMILE sought to offer a consistent measure for teachers to understand the well-being of their students and to adapt so that the community can work together and address any discovered issue.

Within this program, weekly survey deployment was done. During the homeroom/SCALE session, students were prompted by the adviser to spend 3-5 minutes to answer a short survey that measured student anxiety. The adviser may also have chosen to dedicate some of the remaining time to discuss the survey results of the previous week and solicit reactions and solutions from the students.

SMC-SMILE was rooted in the following guiding principles:

- 1. The school needs to consistently hear student sentiment.** On the side of learners as recipients of education, many factors may affect their learning. SMC-SMILE sought to routinize the usage of short surveys to feedback to the school the current status of the students in terms of academic anxiety. The delivery of an online curriculum poses many challenges for learners and educators. A school always runs the risk of ignoring what students currently feel, and that may potentially cause negative impacts on their learning. SMC-SMILE was rooted in the idea that a school should be proactive when it comes to student wellbeing; frequently hearing student sentiment normalizes the tradition of actively seeking ways to improve student conditions.
- 2. We can derive deep insight from longitudinal data.** The major aspect that SMC-SMILE wished to take advantage of was that low-stakes and easy-to-answer surveys allow results to be plotted against time. With no interventions, spikes and dips in the shape of the plot can allow SMC to explore what particular events in the school can affect the students.
- 3. Reflective teaching will allow teachers to implement their own solutions.** All teachers must be empowered to implement solutions to address issues discovered with regards to academic anxiety. SMC-SMILE was rooted in the idea that student sentiment must be put out for the teachers to allow them to implement solutions on their own.

The usage of short surveys was inspired by the results of Gogol *et al.* (2014) Their paper sought to study if a validated questionnaire can be shortened to increase flexibility, particularly for instances when testing time is short. While results were not as satisfactory for single-item test constructs, the research was able to conclude that three-item constructs on academic anxiety and academic self-concept were able to be crafted from long-form surveys. I was able to secure permission from Dr. Gogol to adapt their validated short-form survey for use of Philippine Science High School Southern Mindanao Campus.

Their shortened academic anxiety survey asked respondents to rate agreement to the following sentiments on a four-point scale:

1. I am afraid of most school subjects.
2. In classes in most school subjects, I am afraid that everything is much too difficult for me.
3. During tests in most school subjects, I am afraid that everything is much too difficult for me.

As the original tests were in German, the above items were translations. At face value, the phrasing of the items were difficult to follow in the context of SMC, hence there was a need for localization. A pilot test of a survey including translations of the three items showed a good internal consistency for the three (with a Cronbach's alpha of 0.7 across participating Grade 11 and 12 students), suggesting that this localized survey had good applicability for direct deployment. The localized items on academic self-concept were not as successful however as the Cronbach's alpha was only 0.2, owing to the fact that while students can get good scores (one item being measured), the subjects were not seen as easy (another item being measured). Since the items on academic self-concept were incompatible with our context, these items were dropped from the weekly survey.

Methodology

Deployment of questionnaire for students

A shortened bit.ly link to the validated questionnaire formatted using Google Forms was provided to homeroom and SCALE advisers. An initial orientation session was conducted to inform advisers and other teachers about the program. The advisers were instructed to send the survey link during homeroom/SCALE session every Monday and allocate 3-5 minutes to allow students to complete the survey. After the time allotted, advisers continued to conduct homeroom/SCALE as normal. The project was implemented from January 2021 to April 2021 for a total of 16 weeks of study.

The contents of the Google Form are presented in Figure 1.

Weekly Motivation Check

How is it going?

Online learning has been very difficult for many of us. On our end, it's been difficult to know if things are going right or wrong for your education because we don't see you face to face. We hope by you answering our weekly Motivation Check, we can have a general understanding of how well you're doing so we can think of ways to better help you.

As part of security and control measures, your SMC emails will be recorded when you submit a response, but please know that the identity of your responses will never be shared, not even to your advisers, parents, or SMC management, unless required by law. Your submission (which will not carry your name) will be merged with your classmates when your teacher sees the report.

We hope you become honest with what you feel right now when answering. We hope to regularly hear from you as well.

Keep in touch!

SMC SMILE Team

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Survey questions adapted with permission from:

Gogol, K., Brunner, M., Goetz, T., Martin, R., Ugen, S., Keller, U., ... Preckel, F. (2014).

"My Questionnaire is Too Long!" The assessments of motivational-affective constructs with three-item and single-item measures. *Contemporary Educational Psychology*, 39(3), 188–205.

doi:10.1016/j.cedpsych.2014.04.002

Your email will be recorded when you submit this form

Grade and Section *

Choose

Gender *

Female

Male

Other: _____

General Feelings about Academics

Please select your level of agreement to the following statements. Please remember that this is what you feel at the present moment.

I have negative feelings towards most school subjects. *

Naa koy mga dili maayo na ginabati sa kadaghanan sa akong mga klase.

Disagree

Somewhat Disagree

Somewhat Agree

Agree

In most school subjects, I have negative feelings that everything is too difficult for me. *

Naa koy dili maayo na ginabati na lisod tanan para sa akoo ang mga ginatudlo sa kadaghanan sa akong mga klase.

Disagree

Somewhat Disagree

Somewhat Agree

Agree

During tests or assessments in most school subjects, I have negative feelings that everything is much too difficult for me. *

Kung naay mga test o assessment, naa koy dili maayo na ginabati na lisod ang tanan para sa akoo sa kadaghanan sa akong mga klase.

Disagree

Somewhat Disagree

Somewhat Agree

Agree

The subject I have generally negative feelings about right now is... *

Ang klase na naa koy dili kaayo maayo na ginabati karon kay...

Choose

Figure 1. The weekly survey sent to students during homeroom/SCALE sessions

Data was analyzed directly in the Google Sheet connected to the Google Form. Hence, results were updated as soon as new data arrived weekly. However, duplicate entries were manually eliminated, and dates that did not coincide with the start of the week were manually reassigned to the correct date. The spreadsheet structure is presented in Figure 2.

OVERALL			OVERALL FEMALE		OVERALL MALE			
Statement	Median	% Agree	Median	% Agree	Median	% Agree		
I have negative feelings towards most school subjects.	Between "Somewhat Agree" and "Somewhat Disagree"	50.00%	Somewhat Agree	66.67%	Somewhat Disagree	38.71%		
In most school subjects, I have negative feelings that everything is too difficult for me.	Somewhat Agree	55.56%	Somewhat Agree	76.19%	Somewhat Disagree	41.94%		
During tests or assessments in most school subjects, I have negative feelings that everything is much too difficult for me.	Somewhat Agree	61.11%	Somewhat Agree	76.19%	Somewhat Agree	54.84%		
54 responses	Avg AAS	55.56% 2.64	21 responses	Avg AAS	73.02% 2.84	31 responses	Avg AAS	45.16% 2.51

OVERALL			FEMALE		MALE	
Subject with most generally negative feelings	Percentage	Rank	Percentage	Rank	Percentage	Rank
NA	15%	3	14%	2	16%	3
AdTech	13%	4	14%	2	10%	4
Computer Science	13%	4	14%	2	10%	4
Earth Science	4%	6	5%	6	3%	6
English	2%	7	0%	9	3%	6
Filipino	2%	7	5%	6	0%	8
Integrated Science	2%	7	5%	6	0%	8
Mathematics	26%	1	29%	1	26%	2
PEHM	24%	2	14%	2	32%	1
Social Science	0%	10	0%	9	0%	8
Values Education	0%	10	0%	9	0%	8

Figure 2. The layout of the Google Spreadsheet for batch results. Class results are structured similarly.

Two metrics were summarized from the academic anxiety results: (1) percentage agreement to negative statements, which teachers were instructed to strive to minimize, and (2) academic anxiety score, which is the latent variable measured by the three items adapted from Gogol, which should also be minimized (2014). Separate results were displayed for Male and Female responses for investigation into the gender component. While there were students who reported other gender identities, the frequency was low and hence insights were not rich enough. As a response, they were not included in the report to avoid issues such as the possibility of teachers identifying them. This is true for the analysis in this present report as well.

Responses to subjects with negative feelings were simply ranked and their proportions were provided. Proportions may not necessarily total to 100% if a student reported a subject beyond the possible subjects for their grade level.

As part of documentation and impact assessment, teachers were asked if they conducted any interventions as a response to SMC-SMILE scores for their subject.

Research Ethics

This action research was institutionalized and hence became integrated to homeroom/SCALE sessions, but student submission was still voluntary. I was the only one able to see the SMC emails used to submit the responses. Final results were always deidentified. As part of the regular collection, it was made understood to students that the identity of individual submissions will never be released to advisers, parents or management.

As data was collected every Monday, reports were prepared per class and batch. Weekly batch reports were sent Friday to batch teachers, and monthly institutional reports were sent to management at the start of the month.

Results and Findings

By the end of the implementation period, SMC-SMILE was able to collect 4227 unique responses. Using this data, the Chronbach's alpha value for the three-item survey was 0.89, showing very good internal consistency.

Response rates were low at the start of the implementation period and towards the end, as seen in Table 1. Classes who regularly discussed the survey seemed to have secured good rates.

Table 1. Mean response rates per grade level across four months of implementation

	January	February	March	April
Grade 7	47%	50%	34%	31%
Grade 8	49%	57%	44%	44%
Grade 9	39%	32%	24%	32%
Grade 10	42%	39%	24%	20%
Grade 11	61%	72%	73%	62%
Grade 12	75%	73%	58%	57%

Trends across time

Summarized results across batches are plotted in Figure 1. There was no overall decreasing trend in the metrics, which implies that student well-being did not improve overall at baseline. Student academic anxiety at baseline appears to be 2.5; at the start of the quarter (Weeks 4 and 13), students are at this baseline value and the metrics increase until they peak at 2.7 during exam weeks (Weeks 2 and 11).

The decreases in score after exam weeks might have been confounded by effects of academic breaks held during Weeks 3 and 12. It might be good to explore in the future any potential effects and benefits of having academic breaks happen within the quarter, instead of at the start of the quarter.

Institutional Results

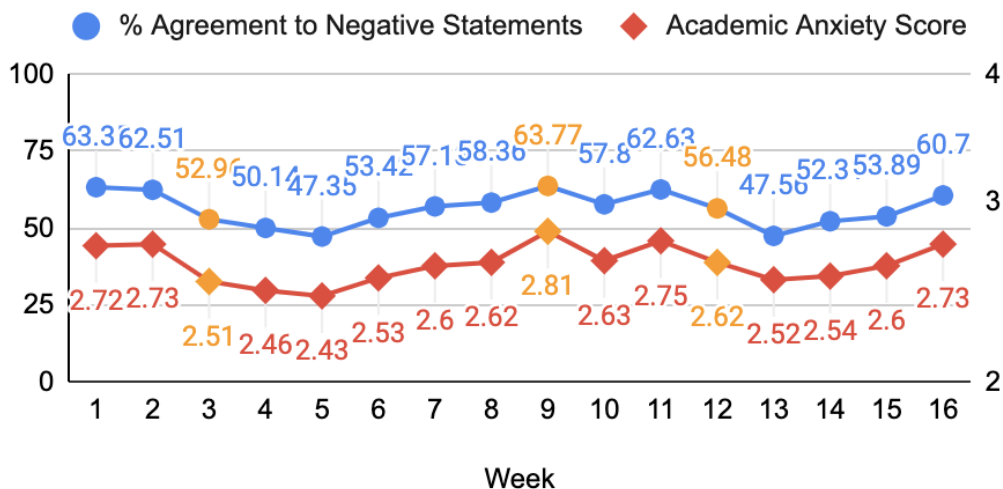


Figure 1. The 16-week results for SMC-SMILE across all grade levels. Values in orange are averaged from the prior and next points since no data was collected for these weeks.

Batch data

Overall, institutional peak academic anxiety score (2.7) was only slight above the midpoint, and these occurred at exam weeks. Hence, student academic anxiety may not have generally been high in the campus. However, data between batches can differentiate the baseline for each grade level. The average weekly distance from the institutional mean for each batch level is presented in Table 2.

Table 2. Mean weekly distance from overall mean for academic anxiety scores per batch

Grade 7	Grade 8	Grade 9	Grade 10	Grade 11	Grade 12
-0.34 (±0.05)	-0.07 (±0.04)	0.2 (±0.1)	0.2 (±0.2)	-0.06 (±0.07)	0.22 (±0.06)

Results are presented in mean (\pm 95% CI). Weeks 3, 9 and 12 were removed in all analyses.

Upon analysis, Grade 7 students had comparably much lower difference from the overall mean, implying that Grade 7 data lowered the overall institutional average. For context, there were ~120 students each for Grades 7 and 8 while there were ~90 students each for Grades 9 to 12. Grades 9 and 10 also had low response rates, leading to high error (hence reduced significant digits). While their mean scores were statistically comparable to Grade 12, I forego any deeper discussion into these levels as it is difficult to be conclusive due to the mentioned limitation.

Grade 12 students having alarmingly high academic anxiety scores were noted as early as January, with the monthly report describing how the scores were high despite the top reported subject being "NA." This suggested a persistent negative attitude towards schoolwork beyond any single particular subject. It was also noted how Grade 12 students benefitted the least from the academic break, with Week 4 scores similar to Week 1. Unfortunately, the Grade 12 scores did not significantly improve over time, so these matters proved difficult to address. Future work may wish to look into whether this pattern is observable in other campuses.

Gender component

An alarming finding was that female students had higher academic anxiety scores compared to male students across all grade levels. This information is presented in Table 3. Of all grade levels, Grades 8 and 11 had the smallest differences in academic anxiety score between genders (2% increase), but academic anxiety increased by almost 10% (Grades 7, 9 and 10, although low responses in Grades 9 and 10 make it difficult to say for certain). The research was unable to discover why this was the case, as a full analysis of the gender data came only after the schoolyear, but this may be an avenue for future investigation to promote STEM education further to female students.

Subject area insights

The top ten most reported subjects which students had negative feelings towards are summarized in Table 4. All subjects (except PEHM) had an approximately even split between

Table 3. Gender-disaggregated summary of academic anxiety scores across grade levels

		Average academic anxiety score	Difference to male scores*
Grade 7	Male	2.13 (± 0.07)	-
	Female	2.40 (± 0.07)	0.27 (9% higher)
Grade 8	Male	2.51 (± 0.08)	-
	Female	2.6 (± 0.1)	0.1 (2% higher)
Grade 9	Male	2.6 (± 0.1)	-
	Female	3.0 (± 0.1)	0.3 (11% higher)
Grade 10	Male	2.6 (± 0.2)	-
	Female	3.0 (± 0.02)	0.4 (12% higher)
Grade 11	Male	2.52 (± 0.08)	-
	Female	2.6 (± 0.1)	0.1 (2% higher)
Grade 12	Male	2.72 (± 0.08)	-
	Female	2.9 (± 0.1)	0.2 (6% higher)

*Values in parentheses presented as percentage points for academic anxiety score

Table 4. Ten most reported subjects with negative feelings

Rank	Subject	n (%)		Total Count*
		Male	Female	
1	Mathematics	356 (52%)	328 (48%)	684
2	Filipino	233 (55%)	190 (45%)	423
3	Research	197 (52%)	185 (48%)	382
4	English	152 (55%)	124 (45%)	276
5	Biology	101 (41%)	146 (59%)	247
6	Computer Science	111 (47%)	125 (53%)	236
7	Social Sciences	88 (49%)	90 (51%)	178
8	PE, Health & Music	107 (67%)	52 (33%)	159
9	Chemistry	62 (44%)	79 (56%)	141
10	AdTech	75 (58%)	55 (42%)	131

*Responses with other gender input were not included in the total.

male and female students. Since subject data here are merged across multiple grade levels with various class sizes, it might be difficult to objectively make claims about the subjects, but the results may be interesting for future curricular design and development. Research being Top 3

is particularly alarming because it is only offered in three grade levels, and Research 3 in particular was only reported 20 times (vs. Research 1 = 132, Research 2 = 230).

Understandably, STEM research is difficult to learn and implement during a remote learning scheme, so future work may wish to look into this matter more closely.

Teacher interventions

Several teachers reported that the SMILE reports were helpful for their teaching, even for the conduct of homeroom/SCALE sessions. I received news from a teacher sharing that they were happy that they managed to improve their SMC-SMILE ranking. Also, a teacher reported using and referring to SMC-SMILE reports in their consultations with students to better understand and assist them in their personal concerns.

There were teachers who, in response to high SMC-SMILE scores, implemented batch consultations to understand better the reasons of their students, and the insights allowed them to improve their instruction. Through consultations, a teacher discovered that the KHub course presentation was a problem for some students, as not all KHub courses had similar structures which led students to compare between classes. The teacher also remarked how some students may not answer the SMILE survey intently, but instead leverage it to pressure the teacher to improve certain aspects of the course. While this may be the case and is alarming, it still leads to the intended result of teachers knowing the feelings of their students with respect to their subject, allowing for reflection.

It was not studied in this action research how many teachers utilized the SMC-SMILE reports for their teaching and how much it impacted their work. Regardless, the fact that this tool has managed to impact the teaching of multiple teachers shows its proof as a good reflective tool. It also can serve as a reflective tool for students themselves, as they self-assess every homeroom/SCALE session, but this matter has yet to be studied intensively.

Conclusions

One of the initial intentions of SMC-SMILE was to encourage reflection among all personnel in PSHSSMC, so that collective efforts would improve student well-being over time. While this was not necessarily achieved, this action research was still successful because it has improved how teachers implemented their lessons through allowing feedback for reflection. Additionally, this action research was able to generate relevant data and information for future planning, such as

in implementation of mental health breaks, or of curricular design. Because this action research is easy to maintain, it may prove to be a good model for implementation in other campuses as well. Particularly, it may be good to explore a research study on a short-form survey that is more contextualized to the needs and goals of the Philippine Science High School System.

Reference

Gogol, K., Brunner, M., Goetz, T., Martin, R., Ugen, S., Keller, U., ... & Preckel, F. (2014). "My questionnaire is too long!" The assessments of motivational-affective constructs with three-item and single-item measures. *Contemporary Educational Psychology*, 39(3), 188-205.