

The Long Way Round

Autobiographical essays by Sungmin Kim

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Contents

Episode 1 The Boy Who Read Number Plates

Episode 2 Among People Born for It

Episode 3 The Day I Sat the Exam Again

Episode 4 Where Students Quietly Give Way

Episode 5 Before I Take the Stage

Episode 6 The Work Still Ahead

The Boy Who Read Number Plates

Everyone named in these essays has given permission.

I went there to teach

At an academy in Britain, I met a student preparing to apply for mathematics at Cambridge. I had not come to Britain to prepare for university. Towards the end of my military service, I had applied for a working holiday. Once there, I did various jobs, including the familiar work of teaching maths. Watching that student, I thought: I could do this too.

When I give a short account of my background, I tend to begin with Cambridge. But I had not planned my life around getting there. First I took students' questions at an academy. Then I did my military service and went to Britain. The idea of going back to university came along the way.

Before all that, I was a student who had always been good at maths. Having a subject you do well in can make life easier: at least it need not be another worry when exams approach. Familiarity, though, does not excuse a lack of preparation. I learnt that quite early, in a middle-school statistics exam.

Getting my best subject wrong

I was born on 9 February 1991 in Daejeon. We lived in Dunsan-dong, then moved to Wolpyeong-dong, and I went to Seongryong Primary School. My parents say that, from a very young age, I was interested in the numbers on car number plates whenever we went for a drive. This is something they have told me, rather than something I remember for myself.

In my fourth year of primary school, I was selected to represent Daejeon in a maths competition and won a prize. In October of the second term of fifth year, we moved to Seoul and I transferred to Eunjeong Primary School. There, too, I joined the gifted maths class and placed highly in national competitions. I went on to Mogil Middle School and Daeil High School, an ordinary high school in Seoul.

So I cannot claim that I was a child who struggled with maths. I liked it and did well at it. I do not think I need to change my childhood to explain why I now tell students to write their working down. It is also true that I made mistakes when I worked things out only in my head, and that those mistakes led me to develop the habit of writing.

In middle school, I did badly in a statistics exam. I had found the topic uninteresting, neglected it and sat the exam without properly learning the concepts. Being good at maths did not prepare that particular topic for me. Afterwards, I stopped treating recognition as enough: I practised until I could actually use a concept in a problem.

Nor did the importance of method come to me in one sudden revelation. As a student, I helped friends; later, I taught students. Exploring mathematics freely and solving a set of problems within a time limit called for different preparation. My thinking developed over years of seeing that difference.

From learning to teaching

At the academy I attended in high school, there was a teacher called Mr Choi Kyung-jae. He had studied mathematics education at Seoul National University and had taught maths for many years. Above all, he was exceptionally capable at the subject and drew a great deal out of me. I never had private tutoring or took online lectures, so that academy was a strong influence during my school years.

Later, he asked me to tutor his son. The person who had taught me was entrusting his own child to me. That was different from being praised as a student. I now had to explain the maths I knew so that another student could understand it. Mr Choi now runs a Naver online community called Areunyuga.

My parents supported me completely. Perhaps that was because I was doing well. Had they pushed me to do better, I would have rebelled. I was that kind of child. I am grateful that they trusted and encouraged me, though I do wish they had set clearer rules for everyday life. Perhaps they held back because I was so rebellious.

So when I tell parents to trust their child, I do not mean that they should set no boundaries. Understanding and encouraging a child can go alongside expecting them to observe everyday rules. That is the distinction I want to make when I talk about my own parents.

Becoming a student again

I entered university in 2009. That May, I began a part-time job in an academy's study hall, taking students' questions. It was my first work as an instructor. Military service followed. Before my discharge, I saw a notice for the first intake of YMS, the UK's Youth Mobility Scheme working-holiday programme. I wanted to see a wider world, so I applied and was accepted.

I did various jobs in Britain, including teaching maths at an academy. When I met the student preparing for Cambridge, I was already someone who taught, but I could become a student again myself. Standing on the teaching side did not mean that my own education had to be over.

I thought mathematics suited me better than engineering. I sat STEP, the examination taken by applicants to mathematics at Cambridge, and received S, Outstanding, across the board. I think that counted for a great deal in my admission. I entered Trinity College to read mathematics on a scholarship

covering full tuition and living costs.

If asked what frightened me as a teenager, I cannot think of much. It was an age that did not know fear, and some of that remains in me. Yet if I could speak to that younger self, I do not think I would tell him to get better marks. “You are going to have a great many experiences later on. Don’t let studying be all you do.”

A child who liked maths had entered a mathematics course, but that did not mean I enjoyed every part of it. At Cambridge, there were subjects that did not suit me and times when I disliked maths. Even for someone accustomed to doing well in exams, there was unfamiliar work ahead.

Among People Born for It

I have not named the fellow students in this essay.

Called in from the library

I once got caught sleeping in the library at CMS, Cambridge's mathematics building. I was called in by someone senior, though I cannot remember whether it was a dean or a warden. They asked why I had done it and whether I had a home. I said I had been studying. Before exams, I often stayed up almost all night.

I was a crammer. It is hardly an exemplary university routine for someone who now talks to students about study habits. But I cannot write that I got up at the same time every day and followed a steady plan. I worked through a lot of past papers in a short period and went over the problem sets, called example sheets, several times. That was the studying I actually did.

I received a First in Part IA and became a College Scholar at Trinity, an academic distinction. If I record only the result, the student called in for sleeping in the library disappears. Both were part of my university life.

What remains after finding the answer

In my first term's supervisions, I became aware of what I could not do well. A supervision is a small class in which a few students sit with a supervisor and discuss problems they have worked on. Until then, I had concentrated on solving problems. I was used to multiple-choice questions and short answers, and struggled to carry a long, open-ended solution through to the end.

Being accustomed to finding an answer is not the same as being able to explain a whole solution. You must write down which definition you begin with and why you can take the next step. Doing well at familiar exams does not remove the need to learn when the form of the problem changes. In my case, those supervisions are one way to explain that difference.

There were also times when I disliked maths, when I had to study a subject that did not suit me. That does not contradict having liked maths since childhood. I could not enjoy every part of university mathematics equally.

Our course was the Mathematical Tripos, progressing through Parts IA, IB and II. I completed it and received a BA, followed in due course by the customary Cambridge MA. Those degree names take little space on a page. They do not mean that I always did well or enjoyed myself while earning them.

Maths over a meal

One fellow student kept talking about maths even while eating during the exam period. He was simply obsessed. He was always studying it. “Born for it” is the phrase that comes to mind, but looking back, what I actually saw was the time and enthusiasm he gave to the subject.

There were students who had represented their countries at the International Mathematical Olympiad, or IMO. Yet the student I saw finish top was not a gold medallist. That alone cannot explain the part talent plays. It did show me that prizes won before university did not settle every result afterwards. I also saw how people approached problems and how long they stayed with them.

I should not use my First to imply that cramming was a good method. Leaving study until just before an exam and repeatedly working through past papers and example sheets are things to consider separately. What I can explain to students now is what I practised. They need not copy the all-nighters or the sleeping in the library.

Picking up my studies again

The hardest part was the exams. At Cambridge, a year’s material was examined all at once. Before graduating, I had a year’s break in my studies for personal reasons, and catching up on my return was difficult. I am not particularly prone to loneliness, so that side was all right. The exams were still hard.

After spending so long bent over books, I also developed early symptoms of a neck-disc problem, for which I recently had a procedure. That is another reason I find it difficult to tell my university story only through marks and degrees. Alongside the successful results were time spent catching up and a problem that stayed with my body.

Another place I remember is the library with Newton’s books. Newton was a Trinity man, and his books are still there. The memory of studying somewhere like that sits alongside the memory of getting into trouble for sleeping in the CMS library. Neither alone describes my university life.

One thing I learnt at Cambridge that I still use in teaching is the process of learning definitions accurately, understanding them and applying them to problems. I cannot simply transplant its classes into a Korean entrance-exam classroom, though. University and entrance-exam courses have different purposes and different student-to-teacher ratios. Korea’s population density and educational setting also matter. What I learnt has to be worked out for the classroom here.

I had long felt suited to teaching. At first, I intended to teach at university. After my first year, I took the GRE Mathematics Subject Test with American graduate study in mind. It was the specialist test, not the general GRE, and I scored in the 99th percentile, the top one per cent. For personal reasons, however, I did not apply to graduate school. I returned to Korea after graduating and taught maths.

If I could say something to myself from those years, it would still be this: “You could have spent a little less time going out to tutor, and a little more time with people.” It comes to mind before any advice about improving my marks. I liked teaching and kept doing it, but I could have given a little more time to the rest of university life.

Back in Korea, teaching maths remained my work. Then I wanted to test the methods I discussed with students in exams of my own. This time I would do more than advise someone preparing for university. I took my own admission slip to the exam hall.

The Day I Sat the Exam Again

The other people in this essay have been left unidentifiable.

Jajangmyeon and tangsuyuk

I found out that I had received a first-round offer for dentistry at Yonsei University through its essay-based entrance exam while eating alone at a Chinese restaurant. I was having jajangmyeon and tangsuyuk: black-bean noodles and sweet-and-sour pork. After checking the result, I finished my meal. I told my family, who said it was good news. That is about as much as I remember of the moment.

I did not make an announcement to my students either. Some saw it on my website and said it was impressive. I had told no one while preparing. Had I failed, it would quietly have come to nothing. I was not particularly frightened.

Put like that, even the reason for taking the exam can sound slight. But there was something I wanted to find out. Could I, the person telling students about a method, actually use it in Korea's maths exams? So I worked through past papers and sat the exam on my own.

An instructor in the exam hall

There was no special occasion behind my return to Korea. I had graduated, so I came back and began teaching various kinds of university-entrance maths in several places. The work I had done before Cambridge had become my full-time occupation.

People who hear my background sometimes ask why I teach grade-10 and grade-11 students rather than the very strongest final-year students or medical-school essay-exam classes. I wanted to see, from grade 10 onwards, where the difficulties faced by grade-12 students began. In the study book's prologue, I compared it to small cracks eventually bringing down a dam. I wanted to meet students when those cracks were first appearing.

Yonsei's essay-based entrance exam for 2022 entry took place on Saturday, 2 October 2021, before the CSAT. Nothing remarkable happened that morning. I took my writing materials and admission slip and arrived on time. A thirty-year-old instructor sat among final-year school students.

There were four maths problems. The first used rolls of a die to construct an isosceles right triangle and asked for the expected perimeter and number of interior lattice points. The last involved polygons formed by drawing line segments inside a triangle. It asked for a vector-sum argument showing that

equal numbers of polygons met each of the triangle's three sides.

It called for sustained written solutions, the kind of work I had struggled with in my first Cambridge supervision. This time, as I wrote, I thought: I'm going to get in. The candidate beside me had an almost blank answer sheet. As I wrote in the study book's prologue, more than a hundred candidates were competing for each place, but my recollection of my own thoughts is surprisingly brief.

After the exam, I probably went back to work. I do not remember what followed as a grand occasion. I did not put everything aside to wait for the result; I found out over a meal. The exam was something I had fitted into my life.

Being able to solve it

After the essay exam came the CSAT. I chose Calculus in the CSAT for 2022 entry and scored a raw 100. In Probability and Statistics, I scored 100 in the September KICE mock exam for 2023 entry; in Geometry, I did the same in the September mock for 2024 entry. Those are full raw marks in three subjects, earned in different exams.

Sitting among school-age candidates, I naturally noticed the age difference. What caught my attention more was how difficult students found it to move past a problem they could not solve. Time was passing, yet they stayed where they were stuck. They were missing the moment to move on to another problem they could answer.

In a classroom, a teacher can pause a solution and speak to a student. In the exam hall, candidates have to choose their next action for themselves. I saw that difference from a candidate's seat. Later, I could draw on the experience when explaining exam management in class.

The three score reports record that I could solve those exams. My marks do not become my students' marks, though. Explaining my method, helping a student use it on their own problem and finding out where they have stopped are further tasks. Passing an exam had not completed that work.

Life after admission

I did enrol in dentistry. But teaching was my work, and I kept taking leave from university. The academic demands made it hard to do both. One reason I sat the pharmacy essay exam for 2024 entry was to move to a course with a relatively lighter study burden. I again received a first-round offer, but did not enrol in pharmacy: I could not remain enrolled in both places.

A short biography can put the two offers side by side: dentistry, pharmacy. Actually attending university while continuing to teach was less simple than those two lines suggest. Being able to gain admission and being able to sustain the life that followed were different questions. I was continuing to teach.

In the study book, I describe maths as a “decoding skill” that can be developed through training. I can contribute my own exam experience to that argument. I cannot erase the fact that I had been good at maths since childhood and say that everyone need only do what I did. There was more work to do in finding out where students struggled.

Once, after teaching at my own pace, I was told that my lessons were too fast even for the highest class in a medical-track academy. Completing my own answer in an exam and waiting for a student’s working in class were different tasks.

Where Students Quietly Give Way

The student types and example dialogue in this essay combine observations of several students. They are not records of an identifiable student or reconstructions of an actual conversation.

Too fast, even for the highest class

Even the highest class in the medical-track division said my lessons were too fast. This was in 2024, when I first taught at Gangnam Daesung Boarding Academy's medical-track division. I taught at my own pace. The class's high ranking did not justify that speed.

On teaching days, I got up before dawn and took the shuttle from Gangnam Daesung to the boarding academy in Icheon. I taught a class working through Daesung's materials, in front of students who had moved into a boarding academy to prepare for medical school. I could solve and explain the problems. Whether the students could follow was a separate matter.

A lesson being too fast need not simply mean that the teacher speaks too quickly. While the teacher explains one line, a student may still be thinking about the reason for the previous one. Before moving on, the teacher needs to check what the student knows. What mattered to me was that even a high-scoring student might understand less than I expected.

I learnt that from students who came to ask questions. Assuming they knew something because their marks were high could leave a gap unnoticed. Knowing a student's grade and knowing whether they understood the concept I was explaining were separate checks. My own mathematical ability could not do that checking for me.

After the student says yes

So I open a lesson with a simple question about the knowledge it requires. If students say they know it, I ask again to find out whether they really do. For a lesson on exponential functions, this could be illustrated as follows. "Do you know the laws of indices?" "Yes." "What is two to the power of zero?" "One." "Why one?" This is an example of what I want to check, not a transcript of an actual student conversation.

A student who remembers that the answer is one may stop when asked to explain why. Simply repeating the correct answer is not all the teacher needs to do. I need to know which rule the student knows and which connection they have missed before choosing the next explanation. There also needs to be room for the student to answer in their own words.

Some students will not write their working even when asked. I do not force them. Sometimes they have to make a mistake before they understand. I, too, developed the habit after getting things wrong by working only in my head. I just hope the exam in which they learn that lesson is not an important one.

As a teacher, you often have to repeat something you already know. A student may still be working towards accepting it. Remembering that I only began writing things down after making mistakes, I cannot expect a habit to change because I have said something once.

Working hard and getting nowhere

There was more than one way for students to drift away from their studies. The types below are composites. One student says, “I’m going to retake the year anyway.” There is still time left, but their mind has already moved on to next year and this year’s work is being put off. Giving that student more problems is not enough.

Their surroundings matter too. Some spend their time gaming with friends who do not study; others change as they spend more time with friends who work hard. Talking only about willpower can obscure whom a student spends each day with and what they actually do.

Then there is the student who works through several problem books, keeps an error notebook and watches online lectures, yet stays in the same place. It is difficult simply to tell that student to work harder. I need to see whether they check only the answer and move on, and whether they can use a supposedly understood concept alone. That kind of studying is what I tried to examine at length in the study book.

I hear related concerns in conversations with parents. “My child is bright, but…” Calling a child bright does not get the studying done. “They would do well if only they studied…” They need something that helps them start and continue. “They get things they know wrong.” Being able to use what you know correctly in an exam is part of your ability. I wrote the practical responses to these three questions separately in *Don’t Solve Math in Your Head*.

I look for changes in behaviour before marks: whether a student who only read solutions now writes their working, or whether someone who checked only wrong answers now examines why a correct one is right. A change in behaviour cannot promise an immediate improvement in marks. It does, however, let me see more precisely what studying is taking place.

I also taught students retaking their entrance exams at Daesung’s repeat-year programme. Some thought they knew material because they had studied it before, but gaps appeared when they tried to solve problems. Among grade-10 and grade-11 students, I saw children acknowledge what they did not know and approach learning eagerly. That was one reason I wanted to teach that age group. I do not mean it as a rule dividing all repeat-year students from all younger ones. These are people I met in class.

What the camera cannot show me

In Daesung MyMac's live courses, Daeinra and Gangdae K Final, I taught practice-exam lessons in the latter half of the year. In a classroom, I can see a hand stop moving or a student's eyes leave the problem. In front of a camera, I cannot. Not being able to check immediately how far students have followed was difficult.

At the boarding academy, I could hear that I was going too fast and reconsider the pace I needed to match. In an online lecture, my explanation keeps going even if a student on the other side of the screen stops. I therefore had to think about both recording a good explanation and finding out whether a student had followed it.

I have developed several ways to address that problem and intend to explain the details separately. I do not want to claim their effects in advance here. Having been told that I was too fast even for the highest class, I cannot assume that no one beyond the camera will struggle.

Before I Take the Stage

I have not named the other contestants or the judges in this essay.

The problem I was given

Let me go back a little, to 2021. In MathKorea's final live teaching assessment, I explained one particularly difficult calculus problem. I remember receiving it about a day beforehand. More than ten people, including the company's head, sat in front of me.

I arranged the solution so that a wider range of students could follow it, not only those already strong at maths. I was teaching before judges, but what I needed to show them was how I would explain something to students. Both solving the problem and communicating the solution were being assessed.

A web banner had led me there. It was the second half of 2021, around the time I was preparing for the essay entrance exam and the CSAT. Daesung MyMac and Daesung Academy were jointly holding the first MathKorea open selection for maths instructors. I was an instructor, so I applied. There was no grand story behind it.

I did not come first

The process ran through an application, a written test, a teaching video, then a live problem-solving lesson and an in-depth interview. I remember thinking how thoroughly they selected people. Unlike the essay exam, where I wrote answers on my own, this time I was being assessed as I explained.

The awards ceremony was on 29 December 2021. I was one of two runners-up and received five million won and a trophy. I did not come first. First prize carried a hundred million won and an online course launch on Daesung MyMac. I received the result by phone and text.

My thoughts were that I had been selected by the country's leading education company and that I should work hard. Students may have different ideas about which company is best, but that was how I felt that day. What comes first in my memory is having been selected, rather than having missed first place.

Winning a prize and launching an online course were not the same thing. I could put MathKorea in my biography, but the platform offered to the winner did not immediately become mine. I continued teaching in classrooms and live courses. The medical-track lessons I described earlier took place in those intervening years.

Work to do before December

The Daesung MyMac courses were confirmed in early 2026 through discussions with company executives. They are scheduled to begin on 14 December 2026. I am preparing courses for grades 10 and 11 covering the full CSAT maths range, Algebra, Calculus I, and Probability and Statistics, alongside Common Maths 1 and 2. From the 2028 CSAT, maths is examined across Algebra, Calculus I, and Probability and Statistics, so this stage of school study connects directly with preparation for that exam.

I also have a personal ambition to expand into Calculus II and Geometry. What I hope to do later needs to remain distinct from the courses already confirmed. Having a plan is not a reason to talk as though those lessons are already available.

These days, I move between the office, company headquarters for filming, and home. Work continues after I get home. A few years ago, I presented a lesson on one problem in a selection contest. Now I am preparing a course that students will keep returning to. Having won a prize does not do that preparation for me.

What worries me is whether students will like my lessons. I cannot see their faces through the camera. I have been told I teach too fast; I have also had to ask again when students said they understood. I want to prepare with those students in mind, on the other side of the screen.

Preparing together

I founded Trinity MathsLab in the first half of 2026 because I needed a team for the course launch. The name came from the college where I studied mathematics. We reduced the team to core staff and made our working arrangements more efficient. I will not disclose the headcount. We share the work of developing lessons, filming them and looking after students.

I had been developing ways to follow students whom I could not see through a camera, and needed people to put them into practice with me. I will not describe unpublished methods here first. A company name or a new tool is one thing; whether it actually helps students is something that still needs to be checked.

I have decided not to exaggerate. I will not claim effects that do not exist or promise that a method can replace effort. I need to keep that standard alongside my wish for the courses to sell well. Wanting to sell them should not change what I tell students.

What I would say to myself before this launch remains the same: “You can do this. You are doing well already. Don’t give up; keep going as you are.” I cannot settle the outcome in advance, but there is work to do now: preparing at the office, filming at headquarters and carrying on at home.

The Work Still Ahead

I would like the courses to sell

Honestly, I would like my courses to sell well. I do not think I need to hide that wish while saying that I want to make lessons that help students. I want more children to watch the classes I have worked hard to record and to be able to follow them. That was also why I began writing the study book.

Don't Solve Math in Your Head covers habits such as writing out working, learning the concepts first and revisiting even the problems you answered correctly. I hoped that reading about things I cannot explain fully in every lesson would help students follow the course. There are thirteen sections, available in Korean and English. I made the full text free to read on a phone at mathskim.com, without registration.

I made it free because I wanted more students to read it. Whether they are about to take a course or studying alone, I hope they can find the part they need. Reading a book will not, by itself, change the studying. The reader still has to try writing out a solution or recording why an answer went wrong.

I have questions too

While writing, and after finishing, I wondered whether the book was really well written. Recording lessons and producing a book mean that I have done my part of the work, not necessarily that students have received what they need. I am reminded of being told that my lessons were too fast even for the highest class in the medical-track division.

Hyunwoo, the student in the book, is fictional. I could not use a real student's private information, so I brought together things I had observed in several students. The student types in these essays were constructed in the same way. Examples made to explain a point should not be read as events that happened to a particular student.

A student who has tried the book's methods for a term may be able to tell me what I have not explained adequately. I am interested less in what they have read than in where they got stuck again. Whether the book is well written is not a question that ends when I close the manuscript.

What I would say to parents

"Believe in your child, but set clear rules for everyday life." That is what I would like to leave with parents. My own parents supported me completely. I still think I would have rebelled had they kept pushing me to do better. At the same time, I wish the everyday rules had been clearer.

I hold both views. Trusting a child does not mean that daily life needs no boundaries. Nor can setting boundaries consist only of repeatedly telling them to do better. This comes from looking back at my own childhood; I am not trying to prescribe the same rules for every family.

To students, I would say: “Do your best. Don’t leave your future self with regrets.” I was a fearless child and a cramming student myself. This is not advice from someone who always studied impeccably. Just as I worked through past papers and revisited problem sets even in a short period, I mean that you should actually do the studying available to you now.

What is not yet decided

If asked what I will be doing in ten years, I tend to start with a joke. In this industry, people talk about the “number-one instructor”. I have heard someone go further and call themselves “number zero”. I would like to be number minus one. I am joking. Half joking, anyway. I do want to become a teacher more students seek out.

I mean it when I say that, ten years from now, I still want to be telling a grade-10 class to write their working down. A student may not immediately listen. I changed some habits only after making mistakes myself. I would like to be a teacher who can explain again then.

Since being the child who watched the numbers on car plates, I have moved between teaching and learning several times. In Britain, I went from teaching a student to applying to Cambridge. After graduating, I went from teaching classes to carrying my own exam admission slip again. I knew a great deal when I stood before students, but that did not automatically tell me what they did not know.

I have gathered these years under the title *The Long Way Round*. I do not mean that everything turned out well because I took a detour. There were periods of leave from university while I continued teaching, and lessons students found too fast. Having reached this point does not let me write a finished story.

For now, I am preparing the courses that begin in December. I move between the office, headquarters where we film, and home. I do not yet know whether students will like these lessons. I worry, and I want to do well. When I get home, the work continues.