

Indira Vijayasimha

Student errors are often a source of irritation, frustration and even anger to teachers. Many of us have memories of our schoolwork heavily marked with red ink highlighting our mistakes and making us feel fearful, ashamed and stupid. However, errors need to be seen as part of the learning process. They can provide many insights to both the teacher and the taught.

'Aside from the direct benefit to learners, teachers gain valuable information from errors, and error tolerance encourages students' active, exploratory, generative engagement. If the goal is optimal performance in high-stakes situations, it may be worthwhile to allow and even encourage students to commit and correct errors while they are in low-stakes learning situations rather than to assiduously avoid errors at all costs.' Learning from Errors Annual Review of Psychology*

Eleanor Duckworth in her classic book, *The Having of Wonderful Ideas*, has this to say '...making mistakes and correcting them reveal and give rise to a far better grasp of the phenomenon than there would have been if no mistakes were made at all.'

Would teachers gain a better understanding of students' thinking if they systematically studied students' mistakes? Can teachers help students learn from their mistakes by encouraging them to acknowledge and analyse their errors? These are some of the questions explored in the book, *The Reflective Learner*. It is an insightful book that documents the experiences of four teachers as they examine the errors made by the children they teach. In the process of their exploration, the teachers also begin to reflect upon their own practice, assumptions and conceptions about students.

The book offers plenty of food for thought to the engaged teacher and at the same time is refreshingly free of jargon. As Kamala Mukunda puts it in her foreword to the book, 'The word *psychology* is everywhere present in the book, but never mentioned (except as part of a referenced title!).' You will not encounter words like, 'monitoring

comprehension', 'protocols' and 'control groups' - words that typically pepper academic research papers in education. Such research papers would probably earn their authors academic credits, degrees or a step up the ladder in academia, but would not offer much to the busy practising teacher. Therein lies the beauty of this book - it is addressed to the practising teacher and has plenty to offer him/her. After reading the book, I hope that many more teachers will be enthused enough to take up similar explorations in their own classrooms and in the process find their jobs much more interesting and deeply satisfying.

The book presents case studies of action research undertaken by two English teachers and two Math teachers and presents details of their explorations and findings in a lively and relatable manner. Each teacher's work is narrated in a separate chapter. While the work of three teachers is narrated by Neeraja Raghavan, one of the teachers, Kanchana, has written about her work in the form of a research study. These four chapters are preceded by an introductory chapter that lays out the context and backdrop. A concluding chapter follows the four narratives and serves to offer a 'bird's eye view of the entire process'.

As Kanchana puts it, the book amply illustrates how 'teacher-researchers transitioned from pointing out errors in a student's work (in order to teach him how to avoid them), to analysing errors for a better understanding of the student's way of thinking.' Each of these four teachers attempts to help students become aware of their own thinking and be able to catch their own errors, thus empowering them to take greater charge of their own learning. As a result of these teachers' action-research, students have emerged more confident about their capabilities and many of them have developed greater interest and engagement with the subject.

Once these four teachers - Prerna, Michael, Gopi and Kanchana - began seriously studying children's errors they seem to have broadly arrived at classroom strategies based on these. All of them

inevitably began categorizing student errors and then began noticing patterns. They then tried to draw students' attention and interest towards the errors. Finally, they gave students plenty of time and practice to spot errors, analyse and overcome them. Some errors seemed to occur more frequently among students, while individual students seemed to have characteristic error patterns.

Both Prerna, who taught English to class V, and Kanchana, who taught Maths to classes IX and X, helped students analyse their errors using a scheme for error categorization. Michael, who taught English to class VIII, had an experience similar to Kanchana's where students needed support to spot their errors and categorize them. Michael came up with a strategy to indicate the errors on the margins of students' work thus, providing clues which helped students pinpoint the error and correct it. Kanchana held individual conversations with students while asking them to categorize their errors. It was interesting to note an instance of an error categorized one way by her that was changed after discussing with the concerned student.

In all four cases, both teachers and students seem to have developed greater insights about their thinking process. Gopi, who taught Math to classes VIII, IX and X has done a fascinating exploration about how children think through math problems in a series of nine 'experiments' that formed his action research. He broke down the solution process into four stages and had students working systematically to find out how they tackled each stage. The details of his work make for fascinating reading. Helping students slow down enough in order for them to avoid superficial errors and also think about the problems systematically was a common strategy adopted by both the Maths teachers. Both of them seem to have largely succeeded in helping students think about their thinking and this, in turn, resulted in students becoming more engaged learners who developed positive attitudes towards Math.

Interestingly, as the teachers engaged with student errors and began seeing these as windows to students' thinking, they also became more aware of their own thinking about the subject and about students. While analysing sources of student error, Prerna discovered that sometimes errors could arise from the way a teacher's question is worded. She found out, to her discomfiture, that she herself had difficulty in answering a question that she had set for the students on a test! Michael became

aware of his assumptions about individual students and was able to re-assess these in the course of his action research. Towards the end of his research, he felt that his own use of the English language improved!

Each chapter in the book tells us a lot about what is going on in the minds of teachers and students as they work together to achieve learning goals. The book describes how teachers came up with strategies to help students develop and value metacognitive skills. Students began to realize that they could learn with greater understanding and that errors need not be something to be ashamed of and that they themselves could minimize errors. It may seem counterintuitive to see error rates go up as a student makes progress. However, this is what Michael noticed with one student who became increasingly more confident with his writing and started using an expanded vocabulary while also constructing complex sentences rather than sticking to simple ones. He rightly concluded that the increased number of error in this student's case was a sign of progress.

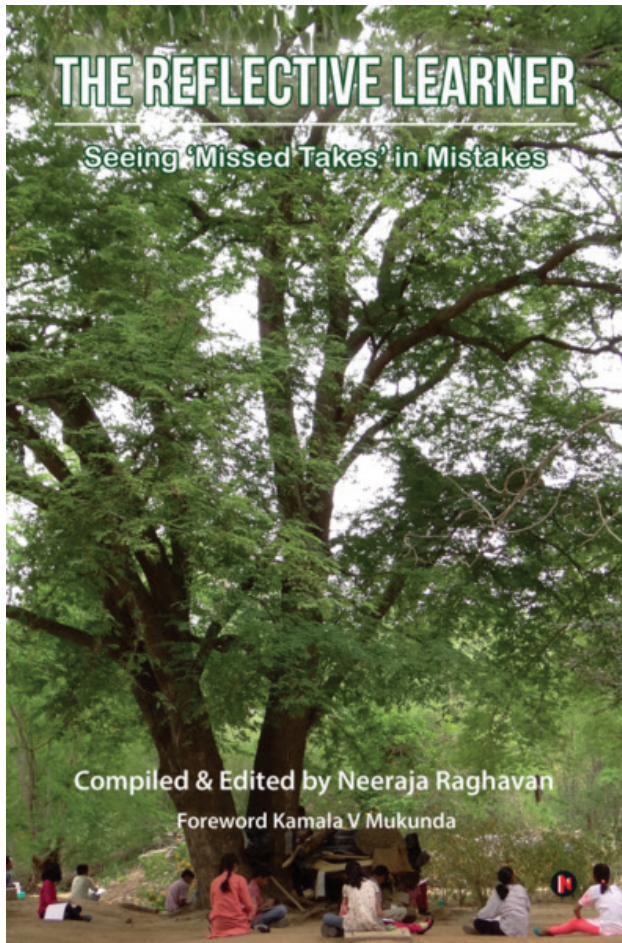
The concluding chapter provides an overview of some relevant literature, but even more importantly, it is an attempt to encourage more teachers to become researchers and try out ways to help students become reflective learners. This chapter clearly lays out the conditions required for a healthy learning atmosphere in which mistakes become the stepping stones towards greater mastery and deeper learning. One key precondition for carrying out such work is the creation of an atmosphere where errors can be acknowledged and analysed without attaching shame or blame. The chapter also lays out the steps for carrying out action research and provides very useful flow charts about the way each of the four teachers featured in the book have gone about their work.

Overall, this very readable book is a welcome addition to the limited set of books available to the inquiring Indian teacher. Anyone who has questions, like why do children make the same mistakes over and over again? Why are the same mistakes made by a large number of students? What can we learn from mistakes? How can we help children do better? will find this book of great value. This book continues the theme taken up in Neeraja Raghavan's previous book, *The Reflective Teacher* and gives us a richly detailed account of how reflective teaching can be broadened in scope

to encourage learners to be reflective as well. This is certainly not a book to be kept on a shelf to gather dust; it needs to be read widely, discussed in

classrooms and staff rooms so that more teachers and students can enter each other's' mind-worlds.

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Seeing 'Missed Takes' in Mistakes

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Neeraja Raghavan

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Indira's deepest concerns are about human well-being and the role of education in promoting or harming it. She understands well-being as a web of mutually affirming and sustaining relationships between all participants in an ecosystem - human, non-human and material. Her work as a teacher and teacher educator provoked a deep questioning about the processes of education and led her to start the Poorna Learning Centre - an 'alternative' school. Indira retired from the Azim Premji University in January 2020. She continues to be actively engaged with Poorna. She has several publications in academic and popular journals. She can be contacted at indira502@gmail.com