Asia Pacific Journal of Developmental Differences
Vol. 4, No.2, July 2017, pp 245—263
DOI: 10.3850/S2345734117000131

Increasing Academic Achievement for Students with Disabilities: Insights from a Study in India on Optimizing Learning Time

Radhika Misquitta[1*], Manika Khanna[1] and Sneha Rawlani[1]

1. *The Gateway School of Mumbai*

Abstract

Academic learning time (ALT) in the classroom is a powerful predictor of achievement (Aronson, Zimmerman & Carlos, 1998). In this article, we describe a study undertaken in a school for students with special needs in Mumbai, India, that sought to optimise ALT in classrooms. As part of the study, we examined how learning time was distributed across different activities. Results indicated that the majority of time was devoted to instruction. Data indicated that while teachers were more proficient with teacher-led instructional activities, activities that supported student-led engagement were rarely employed. Results also indicated that certain accepted teaching practices may detract from learning time if ALT is not considered when planning classes. We discuss suggestions for optimising time and tools for data collection in developing countries.

Keywords: academic learning time, instructional time, students with disabilities

***** *Correspondence to:*
Radhika Misquitta, The Gateway School of Mumbai, Email: radhikamisquitta@gmail.com

The educational scenario in India is concerning. The most recent ASER (Annual Status of Education Report; 2014) report shares dismal findings for literacy, with almost 50% of students in Grade 5 not being able to read second grade material. India fares no better in mathematics. According to ASER, students struggle with foundational mathematics concepts and skills, with almost 20% of students unable to recognise numbers from 1 to 9 in Grade 2, and only 40% able to do procedural subtraction by Grade 4.

India fares poorly when compared on international standards too. Two Indian states, considered among those that rank higher nationally, participated in the Programme for International Student Assessment (PISA) survey of reading, writing and mathematics for 15 year olds in 2009 (Walker, 2011). Out of 74 participating regions, the two Indian states ranked ahead only of Kyrgystan in reading, and ranked last and second to last in mathematics. A World Bank study (Das & Zajonc, 2010) ranked the performance of Indian children below children from 43 of 51 countries participating in the Trends in International Mathematics and Science Study (TIMSS; Mullis, Martin, Gonzalez, Chrostowski, 2003) in 1999 and 2003, with almost 40% of students unable to pass the basic mathematics knowledge assessment.

For students with disabilities, the prognosis is even worse. A World Bank report (2007) estimated that students with disabilities in India were five times more likely to be out of school than students from other marginalized groups and that they rarely proceeded beyond the primary grades (Singal, 2010). In this paper, we explore one school's attempts to increase student achievement, in the hope that our insights and learning can be of support to professionals in their endeavours to serve students with disabilities in India and other developing countries.

Academic Learning Time and Student Achievement

Several factors impact student achievement in the classroom, one of which is the actual time spent learning. Carroll (1963), in his seminal article on school learning, identified time engaged in learning as one of the critical factors impacting a student's success in the classroom. This has been corroborated by decades of research (Coates, 2003; Good & Brophy, 1986; Greenwood, 1991; Jez & Wassmer, 2013; Pischke, 2007; Rivkin & Schiman, 2015; Sorenson & Hallinan, 1977; Tindal & Parker, 1987). In order for a student's performance to improve therefore, he or she must be given enough time to learn the content.

More important than the actual time allocated to learning though, is how this time is employed. If the time is spent in interesting tasks that are highly motivating for students, high quality instruction, and providing the appropriate challenges, students are more likely to learn. This is known as Academic learning time (ALT) and can be defined as the amount of time a student spends actively engaged in an academic task with a high level of success (Denham & Lieberman, 1980). The higher the ALT, the better the academic achievement (Gettinger & Seibert, 2002).

Unfortunately, schools aren't always able to ensure that the majority of time spent in school is Academic Learning Time. Studies have shown that ALT can range from 90% of total class time, to less than 50% depending on teaching practices (Hollowood, Salisbury, Rainsforth & Palombaro, 1995). More alarming is the fact that in developing countries, where students already lag educationally behind their peers in developed countries (Das & Zajonc, 2010; Mullis, Martin, Gonzalez, & Chrostowski, 2003), only a fraction of class time is spent engaged in academic tasks (Abadzi, 2009) and increases in instructional time have resulted only in marginal changes in test scores (Lavy, 2015).

Academic learning time takes on greater significance for students with disabilities as they may require more time than their peers on academic content (Gettinger, 1991). Intensifying instruction by increasing the amount of time students with disabilities spend in instruction on foundational skills in reading, writing and mathematics has been repeatedly associated with higher achievement (Harn, Linan-Thompson, & Roberts, 2008; O'Connor, 2000).

In order to accommodate student needs therefore, educators have explored extending the school day (Aronson, Zimmerman & Carlos, 1998; Bellei, 2009; Farbman, 2015; Lavy, 2010; Patall, Cooper & Allen, 2010). Increasing the school day poses challenges though, particularly as it increases economic cost (Baker, Fabrega, Galindo, & Mishook, 2004; Cotton & Wikelund, 1990; Picus, 1993; Walberg & Fredrick, 1993) and these increased resource inputs do not always result in improved student outcomes (Lavy, 2015; Meyer & Klaveren, 2013; Wiermann, 2005). Instead, studies have argued that of all school learning time, increasing ALT is the most highly correlated with student achievement (Berliner, 1991; Denham & Liberman, 1980; Lassen, Steele & Sailor, 2006; Silva, 2007). Keeping this in mind therefore, maximising academic learning time for students with disabilities in developing countries may be the first step to ensuring higher student success.

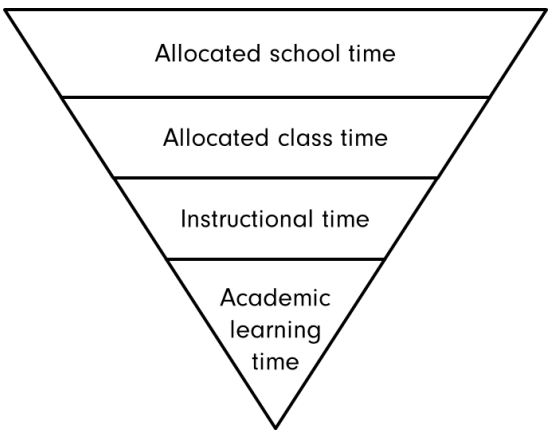

Figure 1. Different types of learning time

In order to understand ALT, one first needs to understand the different types of learning time. These include allocated school time, allocated class time, instructional time, and finally ALT (Silva, 2007). The variables can be viewed as an inverted pyramid, as displayed in Figure 1, with allocated time at the top, and ALT at the narrowest band in the bottom (Aronson, Zimmerman & Carlos, 1998). Allocated time is the number of hours and days students are required to attend school. In India, as per the Right to

Education Act (RTE; Government of India, 2009), the minimum allocated school time ranges from 200 to 220 days annually. Allocated class time is the time allotted by the school for a particular subject. For example, allocating 90 minutes for a Language Arts class. Allocated class time can further be broken into instructional and non-instructional time. Instructional time is how much of the allocated class time is employed to teach the content subject. It does not include time spent on transitioning students, setting up for class, addressing behaviours, housekeeping activities such as attendance, handing out papers and homework. Finally, when the instructional time results in student engagement that is productive with a high rate of academic success, it is termed as academic learning time (Gettinger & Seibert, 2002).

Rationale and Purpose

The present paper describes one school in India's attempts to increase student achievement by examining academic learning time in the classroom. Previous studies measuring ALT and its component skills in the classroom have employed a variety of observation tools. McGrath and Rust (2002) measured transition time for students in self-contained classes versus those who moved to different classes for subjects.

The authors employed direct observation and recorded actual time from the close of one subject to the start of the next. Codding and Smyth (2008) measured the impact of specific feedback to teachers on student engagement and transition time. The authors video-recorded classes and coded the videos using momentary time-sampling for teacher behaviours, including transition time, and teacher-directed instruction and for student behaviours, including on-task behaviours.

Mulholland and Cepello (2006) worked with pre-service teachers to help create awareness about the connection between ALT and student achievement. Ninety teacher candidates video-recorded their classes and coded their classes for specific teacher behaviours, class activities and targeted student behaviours. With the help of their instructors, teacher candidates analysed their classroom data to identify how to increase academic learning time for students. Data was generated as a pie chart for different teacher behaviours, class activities and student behaviours. This enabled teachers to see what percentage of class time was utilised for different activities. We particularly liked how the Mulholland and Cepello (2006) study examined ALT and modelled the current study on it. As a first step to understanding ALT and to make data collection more feasible in a field setting, we limited our study to examining instructional time and how students were engaged during instructional time.

Specifically, we did not measure student success on tasks, which is an important criterion for ALT. We posed the questions: What proportion of allocated time is devoted to instructional time? What activities take away from instructional time? How is instructional time spent?

Operational Definitions

Allocated Time

Allocated time was defined as time allotted by the school for a specific subject.

Instructional Time

Instructional time was defined as time spent teaching content, and comprised teacher-led instruction and student-led activities. Instructional time was calculated by subtracting the time employed in class activities from allocated time.

Non-Instructional Time

Non-instructional time included all activities necessary for teaching but that took away from instructional time such as setting up for class, redirecting behaviours, handing out materials, or collecting homework.

Methodology

Our Context

The study was conducted in a small, non-profit school, serving students with mild and moderate special needs in Mumbai, India. Students in the school were diagnosed with a range of disabilities including learning disabilities (LD), attention difficulties (ADHD), autism, orthopaedic impairments, speech and language impairments, other health impairments and global developmental delays.

Teachers at the school came from varied backgrounds, with only some holding bachelor degrees in education. The teachers underwent an intensive professional development (PD) training programme at the school including workshops, on-site coaching and mentoring, and being part of professional learning communities.

Participants and Setting

Participants for this study were 11 female teachers at the school who:

(a) taught academic subjects,
(b) had undergone summer professional development (PD) at the school, and
(c) taught groups of three students with special needs or more.

Of the 11 teachers, five held bachelor degrees in special education, one held a bachelor degree in general education, two had diplomas in early child education, and three teachers held bachelor degrees in a non-educational field. Four teachers taught Mathematics, three taught Language Arts, and four teachers taught content area subjects like Science, Humanities and Information and Communication Technology. A total of 40 students with disabilities ranging in age from seven to 16 years, participated in the study.

Table 1 presents demographic data for students. Being in India, the majority of students were bilingual, but most families spoke English in their homes and for many, English was the primary language of communication at home and in school. Some families however communicated in languages other than English. These children were categorised as English

Table 1. Student Demographic Data

Characteristics	Lower School (7 – 11 years)	Middle School (12 to 16 years)
Gender		
Male	11	16
Female	9	4
Disability Type		
Learning Disabilities (LD)	4	9
LD + Attention Difficulties	6	5
Autism	4	1
Orthopaedic Impairments	2	1
Global Developmental Delays	4	4
English Language Learners	2	4

Language Learners based on internal assessments by the Speech and Language Pathologists at the school. Classifications of disabilities reported are based on diagnoses shared on student evaluation reports.

All classes were conducted at the school campus. Observers were six staff members of the school and did not participate in the study.

Materials

The dependent variable in this study was an observation checklist measuring instructional time and non-instructional time. Instructional time was divided into teacher-led instruction and student-led activities.

Teacher-led Instruction included all instructional activities directed by the teacher, whether in whole group or small group settings. It was further subdivided into content instruction (explaining) and content instruction (guided).

Content Instruction (Explaining) included whole-group instruction where the teacher was explaining or modelling the task to be completed. Content instruction (explaining) afforded fewer opportunities for students to participate.

Content Instruction (Guided) included whole-group or small-group content-

related activities facilitated by the teacher and where all students had equal opportunity to respond. Students were familiar with the task to be undertaken, and the teacher's role in content instruction (guided) was primarily to clarify doubts and facilitate successful completion of the task. Content instruction (guided) afforded more opportunities than Content instruction (explaining) for students to respond.

Student-Led Activities included all activities that were directed by students, whether individually, in pairs, and in small or large group settings. It was further sub-divided into student-activity (individual) and student activity (group).

Student Activity (Individual) included activities that students completed independently, with minimal support from the teacher, while *Student Activity (Group)* included activities where students worked collectively as a group, with minimal support from the teacher.

Non-instructional time included all activities necessary for teaching, but that took away from instructional time. Non-instructional time included sub-categories of classroom behaviours, free time and movement activities, transitions and wait time.

Classroom Behaviours included activities such as reviewing classroom contracts, defining behavioural expectations or goals, reflecting on behaviours in a group, and addressing individual student behaviours.

Free Time and Movement Activities included free time, non-content-related activities like warm-ups, and movement-based activities to regulate arousal level or provided as reinforcement.

Transitions included time between classes and between activities during a class. Transitions included activities such as students entering and exiting class, moving to different spaces within the class, wait time while the teacher prepared materials for class, or handed out and collected materials, writing homework in their planner or teacher writing in or checking students' planners.

Finally, *Wait Time* included wait-time for students within an activity while the other students continued with the task. Once all students had completed a task and were ready to move to the next, the coding was switched to *Transitions*. Wait time was coded for the class when 50% or more of the class was engaged in wait time. Thus in a group of six students, if four students had completed the task and were waiting to begin the next, the time was coded as Wait Time. Once all six had completed the task and were ready to move to the next activity, the coding switched to Transitions. The coding checklist categories were entered into a web-based customisable timer, Version 3.10.6 of the Google Chrome application Task Timer (Cebulskie, 2014). Figure 2 presents a sample of data collected using the application. This application allows the user to create multiple timers or categories, and if needed, set a time limit for each timer.

There is no limit to the number of timers that can be set and Task Timer allows its users to name the timers. Once the timers

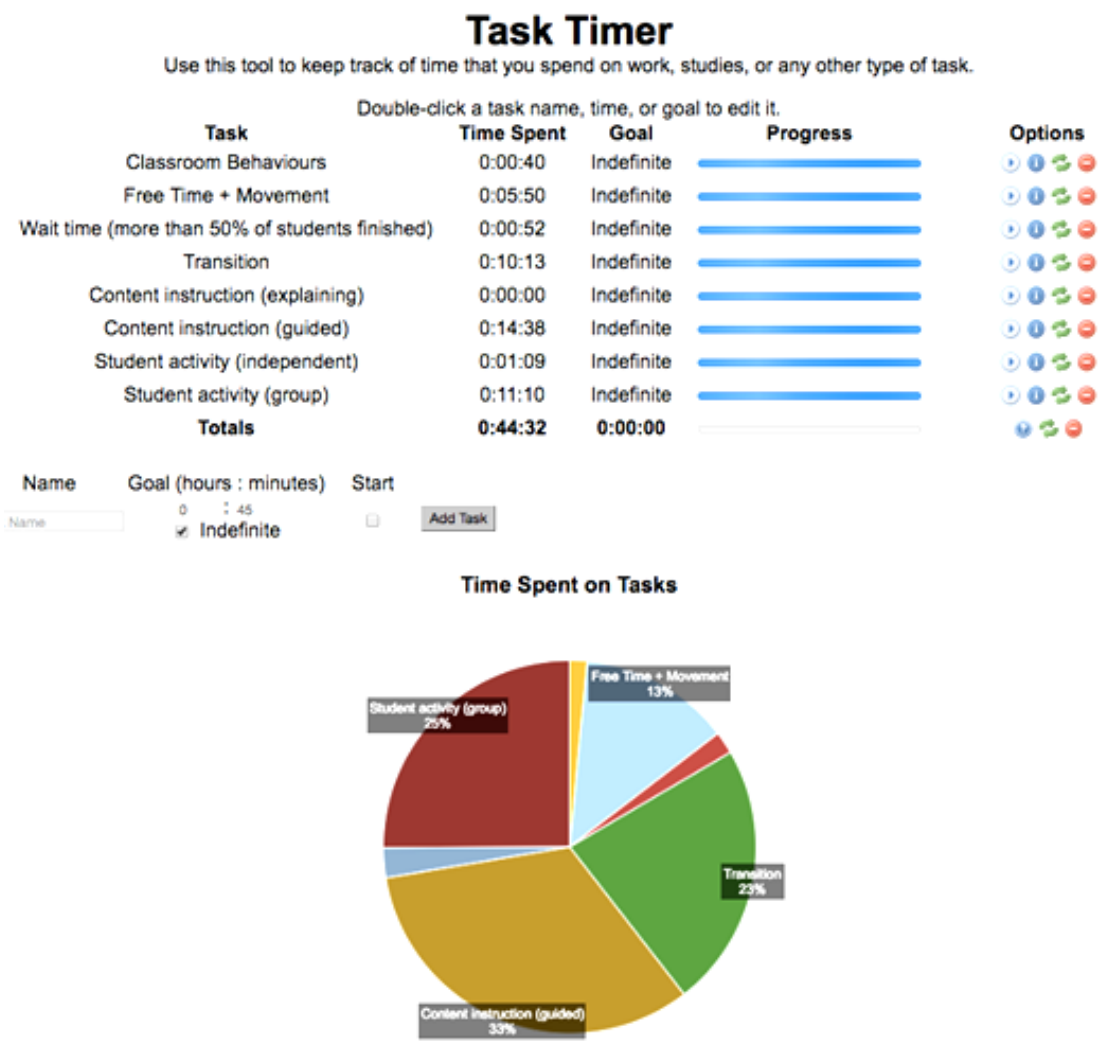

Figure 2. Example of Data Collected via the Task-Timer Application.

are set, multiple timers can run simultaneously, or the user can switch between different timers, automatically pausing the previous one. If needed, recorded times can be manually edited, and specific timers can be reset as required. After each observation, the application presents the data in a tabular format, in actual time, along with a graphical representation using a pie chart.

We used Task Timer to track how much time was spent in each category during each class. In order to do so, we created a timer for each category on the tool. To ensure data was only being coded in one category at a given time, we used the setting "Only allow one task to be running at a time".

Data Collection Procedures

Classes were recorded over three and a half weeks. We attempted to record each class for its entire duration of allocated time, up to a maximum of 45 minutes. For classes that were longer in duration, only the first 45 minutes were recorded. The total time recorded for each class ranged between 22 to 45 minutes. Each teacher was recorded at least once and a maximum of three times.

Each observer watched and coded videos independently. Observers entered data on a spread sheet and uploaded a screenshot of the completed Task Timer application. Each video was watched by at least two observers.

Data Analysis

We coded a total of 25 videos for this study. To establish reliability, each team member watched and coded the first six videos independently. We then met as a team to discuss the data, and agree on the final time and percentage. We had initially planned to code videos independently once we had established

Table 2. Data collection procedures across teachers.

Teacher	Number of classes observed		Subject
	Lower School	Middle School	
Teacher 1	1		Mathematics
Teacher 2		1	Mathematics
Teacher 3	3		Mathematics
Teacher 4		3	Mathematics
Teacher 4	1	2	Language
Teacher 5	3		Language
Teacher 9	1	1	Language
Teacher 6		2	Content Area
Teacher 3		3	Content Area
Teacher 8	1	2	Content Area
Teacher 11		1	Content Area

reliability. However, after coding the initial six, we realised we had several clarifying questions. We therefore entered data only after coming to a consensus. A minimum of two observers watched and coded each video.

The final data set was entered into a spread sheet only after reaching consensus. When data reported by each observer was similar, that is, within 30 seconds of each other, we recorded the median observer time. When there was a discrepancy of more than one minute between observer data, we entered data after reaching a consensus. We therefore established 100% inter-observer reliability.

Table 3 presents the mean percentage of time in each category. We were interested in what proportion of allocated time was devoted to instructional time, what activities took away from instructional time, and how instructional time was spent.

Table 3. Distribution of learning time in the classroom.

Variable	Mean Percentage of Time		
	Overall	Age Group	
		Lower School	Middle School
INSTRUCTIONAL TIME	73	65	79
Teacher-led Activities	49	44	52
Content instruction (Explaining)	17	14	20
Content Instruction (Guided)	32	30	32
Student-led Activities	24	21	27
Student Activity (Individual)	17	12	21
Student Activity (Small Group)	7	9	6
NON-INSTRUCTIONAL TIME	27	35	21
Classroom Behaviours	3	3	3
Free Time and Movement Activities	1.5	1	2
Wait Time	2	1	3
Transition	20.5	30	13

We defined instructional time as comprising both teacher-led and student-led activities. Instructional time accounted for the majority of time spent in the class (73%). We also coded data to determine if results differed across age groups. It can be seen that although the majority of allocated classroom time is spent on instruction in both Lower School and Middle School, instructional time is higher for Middle School (79%) classes than for Lower School classes (65%).

In examining how instructional time was spent, we noted that the majority of instructional time was spent on teacher-led activities (49% of allocated time), while student-led activities accounted for a smaller proportion (24% of allocated time). A similar trend could be seen across Lower and Middle School, with the majority of instructional time being spent on teacher-led, rather than student-led activities. Of the teacher-led activities, teachers devoted more time to guided instruction (32%), rather than explaining and modelling (17%). This finding was similar across age groups. Of the student-led activities, more time was devoted to independent work across Lower and Middle School classes, than to student group work.

Finally, we looked at activities that took away from instructional time. Of the twenty-seven percent of non-instructional time, a very small amount of time was spent on classroom behaviours (3%), free time and movement activities (1.5%) and wait time (2%) while transition time accounted for almost 21 percent of total allocated class time. Examining data across Lower and Middle School classes, we noted that transition times for Lower School were almost double that of transitions in Middle School classes.

Discussion

The purpose of this study was to describe how one school attempted to increase its student achievement by examining academic learning time in the classroom. While the data set for this study was small, and data was gathered only from one site, we hope that the insights and learning through this exercise can inform the field at large, especially those practitioners working in developing countries. Specifically, this study examined what proportion of allocated class time was devoted to instruction, how instruction time was spent, and what activities took away from instructional time.

Data indicated that the majority of class time, over seventy percent, was spent on instruction. Proficient teachers are able to use 80 to 90% of their allocated time towards content instruction (Hollowood, Salisbury, Rainsforth & Palombaro, 1995). It was thus encouraging to see that the teachers of this school were moving close to a proficient level with how time was being used in classrooms. The efficient use of time in class was supported by teachers' effective classroom management strategies. As per our observations, classroom management, wait time and free time accounted for a very small proportion of the total class time.

In examining what activities took away from instructional time, transitions emerged as one area that reduced

instructional time. Transition time accounted for over twenty percent of class time. Transition time for lower school classes was almost double that of time spent on transitions in the middle school. On closer examination of the transition time range in each class (1% to 36%), we noticed that some teachers were able to keep their transition time to a minimum, while in other classes, particularly lower school classes, it was quite high.

Examining the anecdotal data, we noted that when teachers adopted a specific teaching routine, in this case, the *Entry Ticket,* transition times tended to be higher for the group. As part of their *Entry Ticket* routine, students were made to line up outside class and answer a question one at a time in order to enter. Depending on the size of the group, the transition process with this routine sometimes took about 10 minutes of class time. Further, once in class, students often had to wait till all their classmates had entered before starting the activity. This teaching routine was more prevalent in lower school classes, while middle school classes tended to use group routines, such as the *Do Now* routine, where students entered class and completed a worksheet independently. Classes that employed a group activity as a start of class routine, or planned for student engagement activities for those students not answering the *Entry Tic*ket, were more successful at reducing transition time.

We also examined how instructional time was spent in the classroom. From Table 3, we can see that teacher-led activity accounted for the majority of instructional time (49%) as compared to student-led activity (24%) and teachers spent more time on guided instruction (32%) than explaining or modelling (17%). The distribution was similar across lower and middle school classes. In keeping with best practices, we were hoping to see the reverse, with the majority of time spent in student-led, rather than teacher-led activities (Maynes, Julien-schultz, & Dunn, 2010). However, it was encouraging to note that within the teacher-led activities, more time was spent on guided practice, where students had more opportunities to respond, than on modelling and explaining.

Examining data on student-led activities across the classes, we noted that although a mean of 24 percent of time was spent on student-led activities, the range varied considerably between classes (8% to 63%). Of the twenty-five classes that we observed, nine classes spent less than 10 percent of the total class time on student-led activity. Of the instructional time, teachers devoted the least amount of time on students working together in groups (7%).

One possible reason for the reduced time on collaborative group work may have been the nature of the population served by the school. Implementing effective group work can be more challenging for students with disabilities (McMaster, Fuchs & Fuchs, 2002). When teachers did make use of group work, they tended to employ explicit instruction strategies in teacher-facilitated small group settings, which is in line with best practices for students with disabilities (Elbaum, Vaughn, Hughes & Moody, 1999; Gersten, Fuchs, Williams & Baker, 2001; Gersten et al., 2008;

Swanson & Lee, 1998). Teachers however, rarely made use of paired instruction, a well established grouping practice for students with disabilities (McMaster, Fuchs, & Fuchs, 2002), and one that would have enabled instruction to be more student-led.

It is important to note here that although teachers employed guided instruction primarily, the instruction itself was quite engaging and interactive. Teachers made use of choral responses, engaged students in discussions and posed frequent questions to students. We concluded therefore, that while teachers seemed to be more proficient with guided instruction, students were not provided with many opportunities to practice skills independently, whether individually or in groups.

Limitations

The results of this study should be viewed in the light of several limitations. First, the observers were teachers in the school. Although no observer participated in the study, we acknowledge that this may have resulted in a conflict of interest.

Second, the scope of this study was limited only to some components of academic learning time. We were not able to capture student success, a critical component of ALT. Future studies can explore measuring student success in addition to student engagement and time on task when measuring ALT.

Third, we had a relatively small sample size. We had originally planned to have a minimum of 30 classes, but this proved difficult logistically. Although our sample size was representative of the entire school population and a variety of classes, a larger size would have ensured all teachers were represented equally.

Conclusions

The results of the study and their implications for practice are more specific to the school's context and we would hesitate to generalize them to other local, national or international contexts. However, we believe that the process the school employed to identify areas of need was powerful and can be adopted to support increases in student achievement across various contexts.

To begin with, we suggest that schools contemplating addressing student achievement could use ALT as an indicator and first begin with looking at how time is spent in the classroom before investing additional resources. Prior to our conducting this study, the school was exploring other means to increasing learning time in the classroom, such as extending the school day or increasing the number of working days. Both these lines of action would have resulted in increases in resources and inputs.

Studies caution against increasing overall school time if time in the classroom is not utilised effectively (Lassen, Steele & Sailor, 2006; Silva, 2007). By examining ALT in the classrooms, we were able to employ a cost-effective, objective means of maximising student learning, using existing resources. We found this to be a powerful indicator of classroom practices that was easily measurable. The further sub-division of the dependent variable allowed us to

look at different components of instructional time.

Second, we noted that commonly used practices like *Entry Ticket* can get misused if ALT is not kept in mind. We suggest therefore, that ALT be employed as a measure of the quality of teaching practices. It is not sufficient to simply employ an established practice. Teachers need to keep in mind that the strategy should engage all students. At the school in which this study was conducted, we used the data to support coaching sessions with teachers. As part of their reflection on teaching (Larrivee, 2000), teachers were encouraged to analyse their graphs to determine where ALT was being lost. Coaches guided teachers on more efficient strategies that would support learning for all students.

The data also provides an objective and cost-effective means to identify the professional development needs of the organization. After analysing the data, the professional development (PD) team in school developed a training programme that supported the needs identified through the study. The school developed PD sessions on how to effectively engage students in group work and coaches were encouraged to actively support teachers develop and implement effective cooperative grouping practices in their classes. Further, as transition time was identified as an area of need, data on the kind of instructional strategies being employed that took away from ALT and that supported ALT were shared with the team. Teachers were encouraged to use practices that maximised ALT for all students.

Finally, we feel our tool represents a cost effective, organic way to measure learning time. The application is freely available on Google Chrome and can be customized to suit one's context. In identifying tools to measure learning time, we had explored existing educational software and applications. However, most proved too expensive for multiple observers or did not allow for customization. For developing countries especially, we felt that this represented an economical way to measure time spent in a classroom. While we employed the tool for the whole group, it could easily be modified to measure individual student behaviours or as a pre- and post-assessment of teaching practices.

References

Abadzi, H. (2009). Instructional time loss in developing countries: Concepts, measurement, and implications. *World Bank Research Observer, 24*(2), 267–290. http://doi.org/10.1093/wbro/lkp008

Ames, C. (1992). Classrooms: Goals, structures, and student motivation. *Journal of Educational Psychology, 84*(3), 261–271. http://doi.org/10.1037/0022-0663.84.3.261

Aronson, J., Zimmerman, J., & Carlos, L. (1998). *Improving student achievement by extending school: Is it just a matter of time?* San Francisco, CA: WestEd. Retrieved from http://www.wested.org/cs/we/print/docs/we/timeandlearning/intro- duction.html.

Baker, D. P., Fabrega, R., Galindo, C., & Mishook, J. (2004). Instructional time and national achievement: Cross-national evidence. *Prospects, 34*(3),

311–334. http://doi.org/10.1007/s11125-004-5310-1

Bellei, C. (2009). Does lengthening the school day increase students' academic achievement? Results from a natural experiment in Chile. *Economics of Education Review, 28*(5), 629–640. http://doi.org/10.1016/j.econedurev.2009.01.008

Berliner, D. (1991). What's all the fuss about mould lately? (M. Ben-Peretz & R. Bromme, Eds.) *The nature of time in schools: Theoretical concepts, practitioner perceptions*. New York: Teachers College Press.

Carroll, J. B. (1963). A model of school learning. *Teachers College Record*, 723–733

Cebulskie, S. (2014). *Task Timer* [Computer Software]. Retrieved from chrome-extension.

Coates, D. (2003). Education production functions using instructional time as an input. *Education Economics, 11*(3), 273–292. http://doi.org/10.1080/0964529032000148809

Codding, R. S., & Smyth, C. A. (2008). Using performance feedback to decrease classroom transition time and examine collateral effects on academic engagement. *Journal of Educational and Psychological Consultation, 18*, 325–345. http://doi.org/10.1080/10474410802463312

Cotton, K., & Wikelund, K. (1990). *Educational Time Factors.* Retrieved January 2, 2001 from: http://www.nwrel.org/scpd/sirs/4/cu8.html.

Das, J., & Zajonc, T. (2010). India shining and Bharat drowning: Comparing two Indian states to the worldwide distribution in mathematics achievement. *Journal of Development Economics, 92*(2), 175–187. http://doi.org/10.1016/j.jdeveco.2009.03.004

Denham, C., & Lieberman, A. (Eds.). (1980). *Time to Learn*. Washington, D.C.: National Institute of Education.

Elbaum, B., Vaughn, S., Hughes, M., & Moody, S. W. (1999). Grouping practices and reading outcomes for students with disabilities. *Exceptional Children, 65*(3), 399–415.

Farbman, D. (n.d.) *The case for improving and expanding time in school: A review of key research and practice*. Boston, MA: National Center on Time and Learning. Retrieved on May 8, 2012, from http://www.timeandlearning.org/files/CaseforMoreTime.pdf.

Gersten, R., Compton, D., Connor, C. M., Dimino, J., Santoro, L., Linan-Thompson, S., & Tilly, W. D. (2008). Assisting students struggling with reading: Response to Intervention and multi-tier intervention for reading in the primary grades. A practice guide. (NCEE 2009-4045). Washington, DC: National Center for Edu- cation Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. Retrieved from http://ies.ed.gov/ncee/wwc/ publications/practiceguides/

Gersten, R., Fuchs, L., Williams, J. P., & Baker, S. (2001). Teaching reading comprehension strategies to students with learning disabilities: A review of research. *Journal of Educational Research, 71*, 279–320. http://doi.org/10.3102/00346543071002279

Gettinger, M. (1991). Learning time and retention differences between nondisabled students and students with learning disabilities. *Learning Disability Quarterly, 14*(3), 179–189. http://doi.org/10.2307/1510848

Gettinger, M., & Seibert, J. K. (2002). Best practices in increasing academic learning time. In A. Thomas (Ed.), Best *Practices in School Psychology IV: Volume 1* (4th edition, pp. 773–787). Bethesda, MD.: National Association of School Psychologists.

Good, T., & Brophy, J. (1986). *Educational*

psychology: A realistic approach. 3rd Ed. New York: Longman.

Government of India (2009). The Right to Free and Compulsory Education Act. *New Delhi: The Gazette of India.* Retrieved from http://mhrd.gov.in/sites/upload_files/mhrd/files/upload_document/rte.pdf.

Greenwood, C. R. (1991). Longitudinal analysis of time, engagement, and achievement in at-risk versus non-risk students. *Exceptional Children, 57*(6), 521–535. http://doi.org/10.1023/A

Harn, B. A., Linan-thompson, S., & Roberts, G. (2008). Intensifying instruction: Does additional instructional time make a difference for the most at-risk first graders? *Journal of Learning Disabilities, 41*(2), 115–125.

Hollowood, T. M., Salisbury, C., Rainforth, B., & Palombaro, M. M. (1995). Use of instructional time in classrooms serving students with and without severe disabilities. *Exceptional Children, 61*(3), 242–253. http://doi.org/10.1177/001440299506100304

Jez, S. J., & Wassmer, R. W. (2013). The impact of learning time on academic achievement. *Education and Urban Society, 47*(3), 284–306. http://doi.org/10.1177/0013124513495275

Larrivee, B. (2000). Transforming Teaching Practice: becoming the critically refective teacher. *Reflective Practice, 1*(3), 293–307. http://doi.org/10.1080/14623940020025561

Lassen, S. R., Steele, M. M., & Sailor, W. (2006). The relationship of school-wide positive behavior support to academic achievement in an urban middle school. *Psychology in the Schools, 43*(6), 701–712. http://doi.org/10.1002/pits.20177

Lavy, V. (2012). Expanding school resources and increasing time on task: Effects of a policy experiment in Israel on student academic achievement and behavior. *NBER Working Paper* (Vol. 18369). Retrieved from http://www.nber.org/papers/w18369

Lavy, V. (2015). Do differences in schools' instruction time explain international achievement gaps? Evidence from developed and developing countries. *Economic Journal, 125*(588), F397–F424. http://doi.org/10.1111/ecoj.12233

Maynes, N., Julien-schultz, L., & Dunn, C. (2010). Modeling and the gradual release of responsibility: What does It look like in the classroom? *Brock Education, 19*(2), 65–77.

Meyer, E., & Van Klaveren, C. (2013). The effectiveness of extended day programs: Evidence from a randomized field experiment in the Netherlands. *Economics of Education Review, 36*, 1–11.

McGrath, C. J., & Rust, J. O. (2002). Academic achievement and between-class transition time for self-contained and departmental upper-elementary classes. *Journal of Instructional Psychology, 29*(1), 40–43.

McMaster, K., & Fuchs, D. (2002). Effects of cooperative learning on the academic achievement of students with learning disabilities: An update of Tateyama-Sniezek's review. *Learning Disabilities Research & Practice, 17*(2), 107–117. http://doi.org/10.1111/1540-5826.00037

McMaster, K. L., Fuchs, D., & Fuchs, L. S. (2006). Research on peer-assisted learning strategies: The promise and limitations of peer-mediated instruction. *Reading & Writing Quarterly, 22*(1), 5–25. http://doi.org/10.1080/10573560500203491

Mulholland, R., & Cepello, M. (2006). What teacher candidates need to know about academic learning time. International *Journal of Special Education, 21*(2), 63–73.

Mullis, I., Martin, M. O., Gonzalez, E. J., & Chrostowski, S. J. (2003). *TIMSS 2003*

International Mathematics Report. Chestnut Hill, MA: TIMSS & PIRLS International Study Center.

O'Connor, R. (2000). Increasing the intensity of intervention in kindergarten and first Grade. *Learning Disabilities Research & Practice, 15*(1), 43–54. http://doi.org/10.1207/SLDRP1501_5

Parker, R., Hasbrouck, J. E., & Tindal, G. (1992). The maze as a classroom-based reading measure: Construction methods, reliability, and validity. *The Journal of Special Education, 26*(2), 195–218.

Patall, E. A., Cooper, H., & Allen, A. B. (2010). Extending the school day or school year: A systematic review of research (1985-2009). *Review of Educational Research, 80*(3), 401–436. http://doi.org/10.3102/0034654310377086

Picus, L. (1993). Estimating the costs of increased learning time. Los Angeles, CA: University of Southern California.

Pischke, J. S. (2007). The impact of length of the school year on student performance and earnings: Evidence from the German short school years. *Economic Journal, 117*(523), 1216–1242. http://doi.org/10.1111/j.1468-0297.2007.02080.x

Rivkin, S. G., & Schiman, J. C. (2015). Instruction Time, Classroom Quality, and Academic Achievement. *Economic Journal, 125*(588), F425–F448. http://doi.org/10.1111/ecoj.12315

Silva, E. (2007, January). On the clock: Rethinking the way schools use time. *Education Sector*, 1–22. Retrieved from http://www.educationsector.org/usr_doc/OntheClock.pdf.

Tomlinson, C. A., & Imbeau, M. B. (2010). *Leading and managing a differentiated classroom*. Alexandrai, VA: ASCD.

Silva, E. (2007). *On the clock: Rethinking the way schools use time*. Retrieved from www.educationsector.org

Singal, N. (2010). Reaching the marginalized: Education of children with disabilities in India. *Paper commissioned for the EFA Global Monitoring Report* 2010. Retrieved from unesco.altasproject.eu

Sorenson, A. B., & Hallinan, M. T. (1977). A reconceptualization of school effects. *Sociology of Education, 50*(4), 273–289. http://doi.org/10.1017/CBO9781107415324.004

Slavin, R. E. (2006). *Educational psychology: Theory and practice.* (8th ed.). Boston, MA: Pearson Education.

Swanson, H. L., & Hoskyn, M. (1998). Experimental intervention research on students with learning disabilities: A meta-analysis of treatment outcomes. *Review of Educational Research, 68*(3), 277–321.

Tindal, G., & Parker, R. (1987). Direct observation in special education classrooms: Concurrent use of two instruments and their validation. *Journal of Special Education, 21*(2), 43–58. http://doi.org/10.1177/002246698702100205

Walberg, H., & Frederick, W. C. (1993). Instructional time and learning. *Encyclopedia of Educational Research*, 917-924.

Walker, M. (2011). PISA 2009 Plus Results: Performance of 15-year-olds in reading, mathematics and science for 10 additional participants. Melbourne: ACER Press. Retrieved from http://research.acer.edu.au/pisa/1/

Wiermann, C. (2005). Class size, instruction time and central exit examinations : Disentangling the relative contributions to scholastic achievement. University of Konstanz/ZEW Mannheim.

World Bank. (2007). *People with Disabilities in India: From Commitments to Outcomes.* New Delhi: Human Development Unit, South Asia Region.