

# Challenges and Health Risk Faced by Tamil School Students in Malaysia with Immediate Need for ICT Interference

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**ABSTRACT:** Primary schools are the first institution where children receive their early stage of compulsory education. Children in Malaysia require to attend primary school, from the age of seven until the age of twelve. During this period the bag weight and the body weight ratio is likely to be high as some students are relatively small to carry loads similar to older children. In recent years, this issue caught the attention of few parents but the problem of proposition of bag weight to weight and height of children continuously haunts the parent's mind without any form of solution to the problem. Hence the role of ICT are seek in order to shoulder the responsibility of enhancing the teaching engine which depend on traditional books to digital books. Modernizing the current Tamil school infrastructure should also be part of mainstream overhaul in order to create much healthier, safer and exciting environment to study Tamil. This paper address our research finding on possibility of long term health deterioration under gone by Malaysian Tamil school students. Recommendation will also be inked within this paper for better and safer studying environment for our students with improvement to current infrastructure.

*Keywords:*

## 1. INTRODUCTION

Primary schools are the first institution where children receive their first stage of compulsory education. Children in Malaysia require to attend primary school from the age of seven until the age of twelve. During this period the bag weight and the body weight ratio is likely to be high as some students are relatively small to carry loads similar to older children. In recent years, this issue caught the attention of few parents but the problem of proposition of bag weight to weight and height of children continuously haunts the parent's mind without any form of solution to the problem.

## 2. PROBLEM STATEMENT

The Times Of India (2010) have reported that a scientific study has confirmed that heavy back packs carried by children aged 10-13 years can caused disability at later age. The Times Of India also reported that the study conducted by the Movement Analysis Lab of Srinivas College of Physiotherapy and Research Centre in association with Kasturba Medical College in Mangalore on 200 school boys has found that bags weighing 5% of the body weight of child could affect the trunk and lower limb angle and those bags weighing 15% could change all angles pertaining to head, neck, trunk, and lower limb changing the overall posture of the child.

Couple to Times Of India report, article released by "Towards Queensland Tomorrow" says that students who carry heavy school bags may experience fatigue, muscle strain, back pain, distortion of the spine's natural curves and rounding of the shoulders. This fact has also been highlighted by S.Dockrellin in the same report that musculoskeletal symptoms are believed to be multifactorial and Whitfield (2001) states that the carriage of heavy schoolbags is a suspected "contributory factor" and therefore represents an "overlooked daily physical stress" for school children. Risk factors like musculoskeletal discomfort associated with school bag carriage include the combined effects of heavy loads, load shape and size, time spent carrying the load, position of the load on the body and walking up staircases with heavy loads.

A general guideline of 10% body weight, initially proposed by Voll and Klimt in 1997 continues to be the recommended guideline when carrying a back pack style schoolbag. The findings of more recent studies may challenge this guideline. The weight carried by students varies from day to day and studies have reported different results in regards to the average school bag weight. The different age range for students included in the studies may explain some of this variation, but irrespective of age there is a considerable number of school children carrying in excess of 10% of their body weight. Field data sample survey

was conducted at a Malaysian school by surveying about 150 students from standard 1 to 6 of all available 5 classes at each standard. Following information were extracted from the survey:

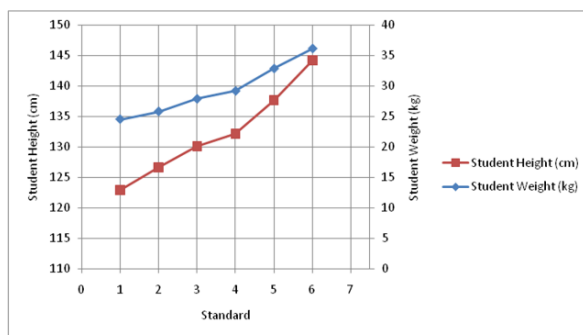
- i. Bag weight (kg).
- ii. Student weight (kg).
- iii. Student height (cm).
- iv. Interview student health condition.
- v. Book sizes ( biggest to average book size).
- vi. Interview teacher on how to reduce bag weight.
- vii. Measure classroom dimensions to identify suitable location to place the locker.
- viii. Measure current table sizes to identify the method to retrofit the table.

Scales and measuring tape were using as tools for measurements. An average of 5- 10 students were randomly selected for the study from each class and standard.

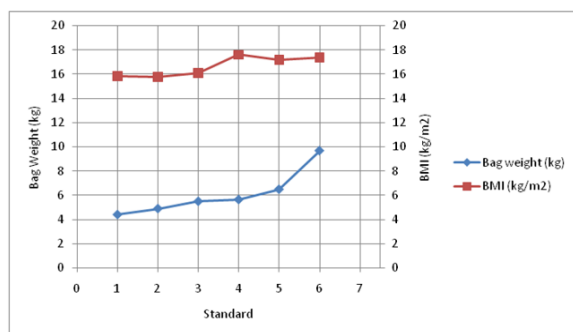
### 3. SUMMARY OF FINDINGS

Few critical plots were made in order to simplify the data collected.

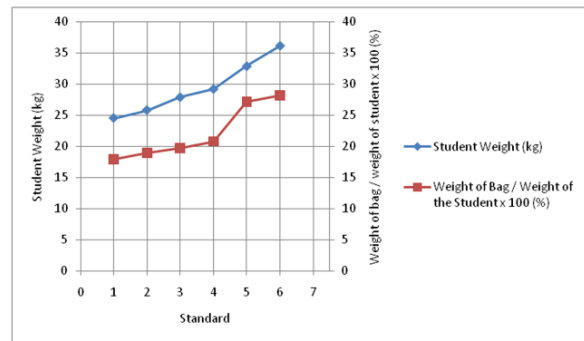
- i. Plot 1 : Student height and weight for all the standards.
- ii. Plot 2 : Student BMI, bag weight for all the standard
- iii. Plot 3 : Student weight, Percentage of weight of bag/ weight of student for all the standard.



Plot 1: Student height and weight for all the standards



Plot 2: Student BMI, bag weight for the entire standard



Plot 3: Student weight, Percentage of weight of bag / weight of student for the entire standard

### 4. DISCUSSION

With the plots and analysis made the students found to be carrying much heavier weight than recommended in the studies reported in “The Time of India”. The bag weight should only be about 5% of the student weight, however the students are found to be carrying their school bag which is about 22.13% of their body weight much higher than recommended by Voll and Klimt (1997). Hence there is a good possibility of the students to have long term health problem related to spine due to heavy school bags. By analyzing the school classroom sizes and possibility of adopting locker system for each student, we found the following problem:

- i. The classrooms are too small to place lockers of about 80 units ( 2 section, 40 students per section). Refer Figure 1.0.
- ii. Most existing furniture are desk without pocket.
- iii. It is unsafe to leave behind the books at the desk pocket without locker, as the next section student might displace the books.

Hence it is proposed to have segmented lockers of 5.3 feet long by 1.2 feet width and 4 feet high with rollers for easy movement within the class room. After taking into account average book size refer Figure 2.0, the proposed locker dimension with improved desk suitable for Malaysian school environment are shown in:

- i. Figure 3.0 shows the stand alone locker system with wheels attached-suitable to move about. However not suitable for classrooms with space constrain.
- ii. Figure 4.0 shows the improved desk system with build in two slim lockers. This approach

can be retrofitted into existing table and suitable for class rooms with space constrain.

A combination of the above two system can be adopted with a possibility of deducting 30% -50% of the student bag weight. Bringing down to tolerable bag weight of less than 10% of student body weight.

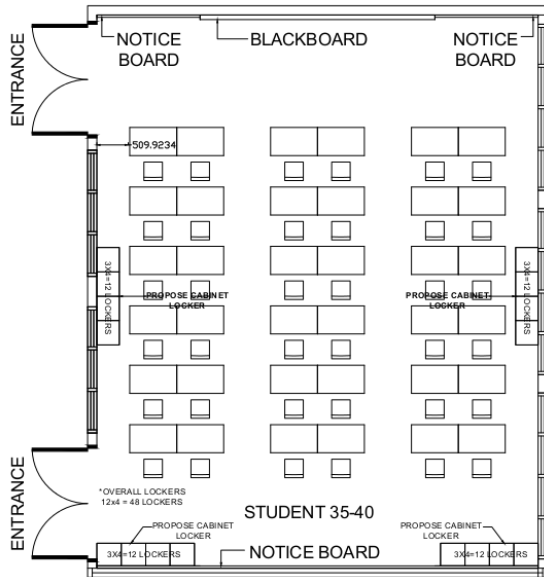


Figure 1.0 : The classrooms are too small to place lockers of about 80 units ( 2 section, 40 students per section)

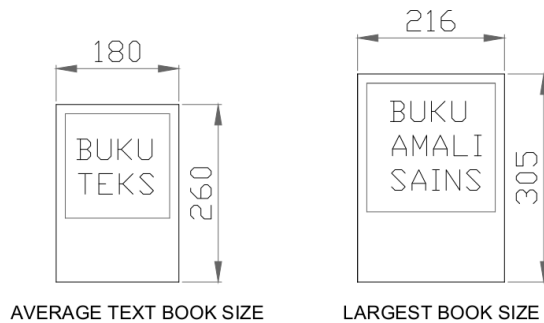


Figure 2.0 : Average book size

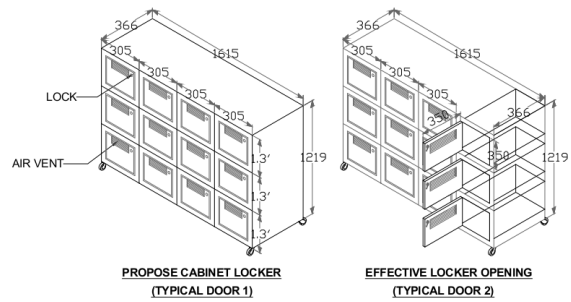


Figure 3.0 shows the stand alone locker system with wheels attached-suitable to move about.

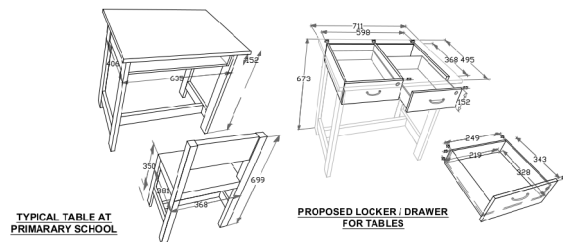


Figure 4.0 shows the improved desk system with build in two slim lockers.

## 5. HEALTH CHECK AND INTERVIEW WITH TEACHERS

Based on the study it is found that the students are carrying bag weight 2 to 3 times heavier than recommended 5-10% of body weight. The ideal weight should be only 5% of body weight.

The students at this early stage found to be not able to report fatigue, exhaustion and muscle weakness due to carry heavy bags. They are silently tolerating the mass in the excitement of going to school and to avoid being punished by teachers. In depth interview and health check is required to be conducted to identify the long term health problem to the children. When a child complains of leg or hand pain or neck pain, the child or parents most likely advice the client to rest, without realizing it is the early signs of spine distortion.

As for the teachers, reduction in bag weight is well received with the use of locker system. This could ensure the references or text books is always available for the teacher to utilize for teaching.



Plate 1 – Weight of students with their bags are scaled



Plate 2 – Size of bag is measured



Plate 3 : Total numbers of bag carried by a student



Plate 4 : Height of student is measured

## 6. RECOMMENDATION AND CONCLUSION

Based on the study it is found that the students are carrying bag weight 2 to 3 times heavier than recommended 5-10 % of body weight. The ideal weight should be only 5 % of body weight. To prevent long term health damage of the children, it is recommended carrying out the following measures:

- i. Teachers are recommended to guide the children what books are required to bring for the day or next lesson.
- ii. Parents are recommended to assist the students in preparing their school bags according to time table and teacher's guide.
- iii. Heavy text and reference books, it is recommended to be left behind in school lockers.
- iv. Propose to introduce lockers for each student within the classroom for reduce the bag weight
- v. Introduce new standalone locker system as shown in Figure 3.0.
- vi. Improve or retrofit the existing desk with pockets as shown in Figure 4.0.
- vii. Perform combination of standalone locker and retrofit the existing desk in order to bring down the weight of school bag.
- viii. Avoid piggy riding work books – old completed work books are paste together with new work books to ensure continuity of notes, however this cause children to carry redundant weight causing the bags to be more heavier.
- ix. Install access ramp, similar to OKU's wheel chairs ramp in order for children to pull the bags on wheels over split platforms to avoid being carried over the staircases or walk long distances carrying the bags.
- x. Introduce single section school in order for students to safely leave their books within their class rooms and reduce bag weight.
- xi. Provide sufficient space at car parks or drop off area for bus and cars to to stop next to an access ramp to minimize bags being carried.
- xii. Install easy to deploy and retrofit hydraulic lift for building blocks higher than 2 floors ( ground floor and first floor).
- xiii. Recommend school building not higher than 2 floors (ground floor and first floor)

- xiv. Allow for larger classrooms to fit in built in lockers
- xv. Implement teaching system using ICT.
- xvi. Digital notes and exercise books using tablets will be able to reduce bag weight.

With all the above recommendation we believe the long term health of the children can be safe guarded.

## 7. REFERENCES

- i. Health & Safe Fact Sheet, Towards Tomorrow's Queensland (Internet) 27<sup>th</sup> July 2012. Available at [http://education.qld.gov.au/health/pdfs/healthsafety/factsheet\\_hevbags.pdf](http://education.qld.gov.au/health/pdfs/healthsafety/factsheet_hevbags.pdf) (Accessed 27<sup>th</sup> July 2012).
- ii Time Of India, Heavy school bags can cause disability in children, (Internet) 27<sup>th</sup> July 2012. Available at [http://articles.timesofindia.indiatimes.com/2010-07-23/chennai/28305425\\_1\\_heavy-school-school-bags-heavy-back\\_packs](http://articles.timesofindia.indiatimes.com/2010-07-23/chennai/28305425_1_heavy-school-school-bags-heavy-back_packs) (Accessed 27<sup>th</sup> July 2012)
- iii. Voll H-J and Klimt F (1977) translated by Theodridis D (1977): On strain in children caused by Carrying schoolbags; 39:369-378
- iv. Whittfield JK, Legg SJ, Hedderley DL. The weight and use of schoolbags in New Zealand secondary schools. *Ergonomics* 2001; 44: 819-824.