



**NEW PRODUCT DEVELOPMENT
THE SMART CHAIR**

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3. EXECUTIVE SUMMARY

Name of product: SMART CHAIR

The purpose of the innovation

- To enable children keeping foot on the floor to encourage an ergonomic sitting position based on their height.
- To improve in sitting comfortability for students during prolonged sitting in classroom.
- To provide a portable chair suitable in various place with light weight design to ease mobility.
- To make it moveable & improve maneuverability for students during their learning process.
- To promote proper body posture and good body mechanic.
- To prevent long term deformity due to improper body posture.
- To promote durability and long lasting to avoid easily damage due to poor quality material is used.

The target market:

Our product is specifically targeted to a private school. From the observation made, it is shown that student needs are their top-priority. Therefore, they will consider the product in order to provide the best furniture regardless the cost needed. Moreover, as the concept of three-way partnership is an important part in most of the private school, the parent involvement is compulsory to make sure their children's performance in school improved. For that reason, the parent will be more concern about factors that may affect their children performance in school. As according to Azabagic et al, 2016, 30% of school time for preschool children needed them to be seated with inadequate posture using a furniture design that is not suitable by its dimensions to the body. Thus, it is important for the children to have specifically designed furniture for a child's body proportions & recommended different sitting posture. Other than that, Azabagic et al, 2016 also stated that the prevalence of musculoskeletal pain, particularly chronic pain in school children aged 8-12 years is high. Therefore, to avoid other health complication especially due to improper furniture, the school management will consider the product. Furthermore, a private school is an international educational institution. Thus, the decreasing of the student performance in school due to

environment factor such as the furniture will certainly affect their school standard. Consequently, the school management will consider the product that will benefit them as a long term investment.

As referred to the article of "Ergonomics in the Classroom, 2015", it shows that over 83% of elementary school children sit at chair-desk combinations which are not suitable for their body height. The elementary children spend around 9 hours sitting per day and most school furniture is out dated and does not conform to minimum orthopedic-physiological requirements. Thus, adjustable furniture is preferred, due to the different dimensions of the body.

4. INTRODUCTION

4.1 Problem Statement

According to the articles and researches that we have found, a lot of musculoskeletal problems have been caused by current school furniture especially on the chair itself. For instance, musculoskeletal system is compromised when posture is affected by an awkward body position while sitting or when lifting a heavy school bag (Syazwan et al., 2011). From the observation, the problem that relates to the current school furniture has been listed as below:

- 1) The feature of the furniture does not meet different children's height
- 2) The hard surface of the seat causes pain mainly for prolonged sitting
- 3) A heavy wooden type furniture, difficult to be lifted and moved
- 4) The features that have poor supporting design leads to non-ergonomic sitting position which may cause other health problem.
- 5) Causes long term back pain
- 6) Easily damaged due to poor quality material used.
- 7) Take up too much space to keep.

4.2 Methodology: Data Collections

This is the methodology that we used to gather information about the proposed innovation.

1) Observation:

We have been to one primary school, which is Sekolah Kebangsaan Puchong Utama to see the exact picture of furniture used in the school. From the observation conducted, we found out that they are using a standard plastic chair that adults would fit. It is certainly does not meet their body dimension that leads to improper body posture. This situation can be seen in figure 1 and figure 1a. However, different situation was observed at Rehabilitation Department of Hospital Melaka. As seen in figure 2 & figure 2a, the atypical child was seated on a small wooden chair. The concern here is the comfort ability of the child. Their concentration & attention will certainly being affected for a prolonged sitting due to the hard surface of the furniture.