

To: Co-Chairs Sen. Roblan, and Rep. Smith Warner, Co-Vice Chairs Sen. Knopp and Rep. Smith and members of the Joint Committee on Student Success



From: Anne Nesse, a public school teacher of 20 yrs. and current Director of Study in the science of Sustainable Economics

As a long time teacher in the public schools, and current tutor of 2nd and 3rd grade students in Oregon, I am testifying in favor of HB 2018. We need more solid evidence based study, of our current use of educational funds, so that we can maximize the use of those funds, for the positive futures of all young Oregonians.

I have talked with a number of the members of this committee on this subject, that has already been extensively studied on increasing student success, at a relatively low cost, and very fundamental way in terms of brain development and the quality of education. Today I would like to briefly summarize this information as researched by the American Academy of Pediatrics in their extensive position paper of 2018, <https://pediatrics.aappublications.org/content/142/3/e20182058> evidenced with over 147 citations, on how to maximize the educational development of our youth of all ages pre-K through grade 12:

Primary Conclusions from the American Academy of Pediatrics research. I am quoting word for word from this position paper, to make this brief, as it relates to education, and the affects of this research continuing into adulthood:

1. Play is not frivolous: it enhances brain structure and function and promotes executive function (ie, the process of learning, rather than the content), which allow us to pursue goals and ignore distractions.
2. An increasing societal focus on academic readiness (promulgated by the No Child Left Behind Act of 2001) has led to a focus on structured activities that are designed to promote academic results as early as preschool, with a corresponding decrease in playful learning. Social skills, which are part of playful learning, enable children to listen to directions, pay attention, solve disputes with words, and focus on tasks without constant supervision.
3. Play is fundamentally important for learning 21st century skills, such as problem solving, collaboration, and creativity, which require the executive functioning skills that are critical for adult success.
4. Research on children's learning indicates that learning thrives when children are given some agency (control of their own actions) to play a role in their own learning. The demands of today's world require that the teaching methods of the past 2 centuries, such as memorization, be replaced by innovation, application, and transfer.
5. Outdoor play provides the opportunity to improve sensory integration skills. These activities involve the child as an active participant and address motor, cognitive, social, and linguistic domains. Viewed in this light, school recess becomes an essential part of a child's day. It is not surprising that countries that offer more recess to young children see greater academic success among the children as they mature. Supporting and implementing recess not only

sends a message that exercise is fundamentally important for physical health but likely brings together children from diverse backgrounds to develop friendships as they learn and grow.

6. Play is not frivolous; it is brain building. Play has been shown to have both direct and indirect effects on brain structure and functioning. Play leads to changes at the molecular (epigenetic), cellular (neuronal connectivity), and behavioral levels (socioemotional and executive functioning skills) that promote learning and adaptive and/or prosocial behavior.
7. The dendritic length, complexity, and spine density of the medial prefrontal cortex (PFC) are refined by play. The brain-derived neurotrophic factor (BDNF) is a member of the neurotrophin family of growth factors that acts to support the survival of existing neurons and encourage the growth and differentiation of new neurons and synapses. It is known to be important for long-term memory and social learning. Play stimulates the production of BDNF in RNA in the amygdala, dorsolateral frontal cortex, hippocampus, and pons.
8. Play and stress are closely linked. High amounts of play are associated with low levels of cortisol, suggesting either that play reduces stress or that unstressed animals play more. Play also activates norepinephrine, which facilitates learning at synapses and improves brain plasticity. Play, especially when accompanied by nurturing caregiving, may indirectly affect brain functioning by modulating or buffering adversity and by reducing toxic stress to levels that are more compatible with coping and resilience. In children, play usually enhances curiosity, which facilitates memory and learning. During states of high curiosity, functional MRI results showed enhanced activity in healthy humans in their early 20s in the midbrain and nucleus accumbens and functional connectivity to the hippocampus, which solidifies connections between intrinsic motivation and hippocampus dependent learning.
9. Children who were in active play for 1 hour per day were better able to think creatively and multitask. Randomized trials of physical play in 7- to 9-year-olds revealed enhanced attentional inhibition, cognitive flexibility, and brain functioning that were indicative of enhanced executive control. Play with traditional toys was associated with an increased quality and quantity of language compared with play with electronic toys.
10. The health benefits of play involving physical activity are many. Exercise not only promotes healthy weight and cardiovascular fitness but also can enhance the efficacy of the immune, endocrine, and cardiovascular systems.
11. Many schools have cut recess, physical education, art, and music to focus on preparing children for tests. Unsafe local neighborhoods and playgrounds have led to nature deficit disorder for many children. A national survey of 8950 preschool children and parents found that only 51% of children went outside to walk or play once per day with either parent. In part, this may reflect the local environment: 94% of parents have expressed safety concerns about outdoor play, and access may be limited. Only 20% of homes are located within a half-mile of a park.
12. There are barriers to encouraging play. Our culture is preoccupied with marketing products to young children. Parents of young children who cannot afford expensive toys may feel left out. Parents who can afford expensive toys and electronic devices may think that allowing their children unfettered access to these objects is healthy and promotes learning. The reality is that children's creativity and play is enhanced by many inexpensive toys (eg, wooden spoons, blocks, balls, puzzles, crayons, boxes, and simple available household objects) and by parents who engage with their children by reading, watching, playing alongside their children, and talking with and listening to their children. It is parents' and caregivers' presence and attention that enrich children, not elaborate electronic gadgets.

13. On the implementation side, research indicates that breaks during the school day of over 15 minutes were associated with better teachers' ratings of classroom behavior scores.
14. Finally, it is recognized among educators that recess represents the most powerful strategy to get the most children to participate in physical activity. In its "Physical Activity Guidelines for Americans", the US Department of Health and Human Services recommends 1 hour or more of physical activity per day, with a major part of the hour dedicated to moderate to vigorous physical activity at least 3 times per week for children and adolescents.

Most of this research is actually common sense. The quality of educational hours is more important than the quantity of hours spent, that is also common sense. If we measure educational results it should include outcomes for individuals. And our primary goals as a state should be towards healthy brain development (especially outdoors, in our often cloudy wet environment), healthy exercise development, and the ability to creatively solve problems as adults and in group social settings as well. Without developing these skills we simply are wasting our educational dollars. We are not educating robots in school, in a situation where we can pour a given quantity of curriculum in at given speeds and ages. More laudably in Oregon we should be educating human beings, that mature at individual rates, and in individual styles. We must not only teach to specific test taking abilities on paper. We must also have rest/play/exercise/outdoor periods allotted during the day, to prepare young brains for the academic curriculum we are wanting them to retain, and be competent problem solving with, so that students can perform well on all kinds of tests.

HB 2018 allows us to begin with already proven research, and move on to student success. We can then find we have some simple and sometimes inexpensive solutions, that will increase graduation rates, because our students are respected as humans who need exercise and some free time between academic work. We may also decrease addiction rates and suicide rates, because students will have learned that the primary treatment for sadness and depression is exercise and outdoor play, which unlike using counseling or medicine, is the first medical treatment. And on top of all that we may save money. And have some to spare in our state budget for post-secondary education. So that all of our youth can have the hope of a partially paid education toward a career, and have graduated from grade 12 with the problem solving abilities to cope and acquire a more positive future.

Thank you for listening, and if you have any questions on how we can make this a reality I would appreciate them, and enjoy service of some kind on this study. I already know from talking with Superintendents and many teachers in Oregon that they have many implementation ideas as well. It will not be difficult to include more outside time into Oregon's curriculum, in a gradual recommendation, perhaps within the Department of Education, as long as we jointly decide that this time is part of an excellent curriculum.

Anne Nesse, Director <http://SustainableEconomiesNW.com>

