

Balls, Sticks and Other Tricks: *An Investigation into the Benefits of Teaching Juggling Apparatus in Schools*

By Nic Seton

Juggling apparatus, specifically juggling balls, diabolo, devil sticks, twirling poi and similar equipment have a deep anthropological background and exemplify the human capacity for play.¹ Recently, juggling arts have increased in popularity due to the acknowledgement of their value.² There is a broad range of benefits associated with the practice of these apparatus in curriculum, extending from the intellectual and physical development of students to the emotional and social aspects of physical education.³ This article provides an analysis of the achievable benefits of integrating skilled juggling apparatus with classroom and physical education in schools.

The skills of juggling arts today have their roots deep in the indigenous traditions of a multitude of cultures.⁴ From their distant origins, traced as far back as Egypt 4,000 years ago,⁵ skilled apparatus practices evolved worldwide and have culminated, particularly in the last two centuries, to produce the modern institutions known commonly juggling. Recently, juggling arts have been increasing in popularity and academic attention, as the value of these activities is becoming further understood.⁶ The process of learning juggling apparatus is not restricted to the perfection of performing one particular task, but related to many aspects of development and interaction, especially in the education of children.⁷ This article will outline the benefits of adding skilled juggling apparatus – compact equipment like juggling balls, diabolo, devil sticks, twirling poi and similar instruments – to classroom and physical education. The practice of these apparatus is known by various names, but this analysis will refer to the practice as skill-play. This investigation explores four main categories of benefits to school students from skill-play tuition, specifically intellectual, physical, interpersonal and emotional benefits, along with a brief examination of the advantages for wider school communities.

Skill-play for Schools

Skill play apparatus provide an accessible and practical option for schools, as the equipment is affordable, safe, durable, compact, easily stored and is a transportable teaching resource. Skill-play needs only conventional physical education spaces, indoors or out, thus providing an alternative rainy-day physical activity. Schools that integrate skill-play into curricular and extra-curricular activities also increase the range of subject matter available to students in mathematic, scientific, physical and artistic faculties. Additionally, skill-play activities are universally available to all students, providing endless opportunities to students of various abilities, needs and learning styles. Introducing skill-play serves to consolidate school spirit⁸ and increases the performance and display potential of the school.⁹ The greatest benefits to school communities, however, is the development of those key elements at the heart of the institutional structure; the individual students.

Intellectual Benefits

While, for students, the numerous benefits of skill-play fall into many categories, perhaps the most notable are the intellectual benefits. Intellectual abilities developed through skill-play have far-reaching applications, especially in literacy, cognition, psychology and academic skills. Skill-play incorporates and develops fundamental cognitive capacities, such as critical analysis, conceptualising models, spatial awareness and understanding of patterns, rhythm and sequencing. The wider application of these allows for development of scientific and mathematical analysis skills.¹⁰ Students of all learning styles, strengths, and intellects can achieve these benefits, incorporating verbal, spatial, musical, kinaesthetic, intra-personal and interpersonal learning.¹¹

In terms of direct academic benefits, skill-play relies on and develops such core academic virtues as concentration, patience, goal management and perseverance. For example, skill-play directly encourages students to concentrate on specific tasks,¹² a benefit that carries through to improved concentration in other subjects.¹³ Students also employ patience and persistence in skill-play training, as gratification and progress is incremental and dependent upon the amount effort applied. Such perseverance is reinforced in students through “sticking at specific tasks”,¹⁴ whilst resilience is developed via natural mistakes from which students “bounce back”¹⁵. Goal management is inherent in skill-play, students are required to understand and set goals in attaining discrete accomplishments.

Reviewing these factors, it comes as no surprise that skill-play is associated with improvements in students’ general academic performance.¹⁶ Due to the volume and diversity of mental resources drawn upon in skill play, it also benefits specific subject areas including Music, Science, Art, Maths, Physical Education and Performing Arts.¹⁷ Research has revealed that learning to use skilled juggling apparatus is linked to improvements in both handwriting and reading skills.¹⁸ These improvements are attributed to developments in “tracking”¹⁹, that is, learning to track objects with the eyes, and in addition, the enhancement of fine motor skills.²⁰

Other academic benefits include improvements in learning ability. For example, when students participate in energetic breaks of physical activity, “they return to academic tasks refreshed and will learn better as a result... like having a “right brain break in a left brain day,”²¹ a phenomenon easily utilized via skill-play activities.

Learning ability is also fostered through the development of an appreciation for the processes involved with learning and teaching. Skill-play reinforces the ability to deconstruct and reconstruct skills and activities,²² a part of logical categorization and classification involved in learning. The practices of skill-play involve an understanding of the educative approach to each task, thus students are developing skills, such as “learning to learn”.²³ Consequentially learning how to teach and communicate reinforces the wide range of intellectual benefits provided by skill play. These benefits are continually reinforced with sustained practice; where skill-play is incorporated and sustained in a student’s education, the learning process is cumulative.²⁴

Physical Benefits

Skill-play, based on physical activity, has both broad and complex physiological and psychological benefits for students. Amongst extensive physiological effects are coordination, ambidexterity, physical fitness, balance, rhythm, reflexes and psychomotor skills. On the other hand lie subtle but significant psychological effects, particularly left and right brain activity (bilaterality) and selective increases in the brain's grey matter.

Skill-play practice requires and maintains a level of fitness and agility pertaining to the development of apparatus skill.²⁵ The repetitive motions of throwing, catching, moving and lifting build and tone muscles whilst providing a cardio-vascular and pulmonary workout.²⁶ Skill-play is an alternative to conventional sport involving low-impact aerobics, "rhythmically and energetically [exercising] the big muscles close to the head and the heart, pumping blood to the brain".²⁷ It rapidly develops ambidexterity, which is directly advantageous for physical activities, particularly other sports.²⁸ Continued interaction with skill-play apparatus enhances balance, timing and reflexes, particularly brain controlled coordination (psychomotor skills), resulting in improvements in general physical awareness. Psychomotor skills involving gross and fine motor coordination are honed through the practice of skilled juggling apparatus.²⁹

This development of the brain in skill-play results in many psychological benefits for students, and is enhanced by bilateral activity³⁰ – developing both sides of the brain, actualising creative and analytical potential. Author Dave Finnigan elucidates that bilaterality is inherent in skill-play:

While they're learning to juggle, they're using the left side of the brain; when they're juggling, they're using the right side. After they've been juggling for a while, both sides of the brain are active.³¹

By engaging both hemispheres, skill-play appeals to multiple intelligences, left and right, analytical and creative.

Another psychological benefit of skill-play is the effect on neuroplasticity, that is, shaping of the brain. This relationship was explored in a recent study published in *Nature* (2004), in which individuals taught to juggle "show[ed] a transient and selective structural change in brain areas used for processing and storage of complex visual motion" when compared to their own earlier brain scans and that of a control group.³²

Interpersonal Benefits

A less quantifiable but no less significant area of benefit is that of social consideration. Skill-play has much to offer as an inclusive and non-discriminate group activity. The integration of skill-play into school life creates a safe, pro-social physical activity for students, developing trust, respect and group stability.³³ Put simply, there are no losers in skill-play education.

Skill-play education is an inclusive alternative to typical competitive physical education and a positive model for cooperative learning.³⁴ Competition is available through skill-play, directly and indirectly, through the use of skills in other sports, as

well as through competition with others and one's own past achievements.³⁵ Overall, however, skill-play is extremely cooperative, creating a place for development of interpersonal skills. As students learn new skills, they become able to teach skill-play to each other.³⁶ Thus, students develop communication and cooperative roles in group activities. This gives interpersonal learners a way to excel.

Other learning types – such as musical, spatial, and kinesthetic – are also provided for by skill-play education.³⁷ Skill-play activities, by being accessible to students of any age, gender, background, physical skill, fitness, experience or ability, create “a great medium for kids to learn how to accept differences.”³⁸ It provides an equal playing field and a suitable educational activity to students with disabilities, behavioural problems and students not interested in team sports. Unmotivated students are reported to have learnt new skills, gained confidence and learnt to work as part of a team through the practice of skilled juggling apparatus.³⁹ Additionally, skill-play activities have been linked to improvements in learning disorders such as ADHD and Dyslexia.⁴⁰

Emotional Benefits

Students find, in skill-play, considerable personal and emotional benefits, including improvements in confidence and self-worth.⁴¹ Self-confidence and self-esteem affect all areas of a student's performance. Consequently, boosts to self worth effectively enhance performance in all subjects, essentially influencing their attitude towards schoolwork.⁴²

Confidence and esteem are influenced by the achievement and feedback that come with skill-play success, especially in the form of praise, applause, and eventual internal gratification for sustained effort. Improvements in these aspects of the self create “a self-reinforcing system”⁴³ of rewarded effort, which in turn influences students' wider efforts in all endeavours.

When learning skill-play, all students, of all skill levels, “persevere through a series of minor failures (drops)”⁴⁴ of which there is no negative stigma attached, only positive reinforcement through perseverance, working together and accomplishment.⁴⁵ Additionally, skill-play practice can be maintained in whole, without a coach, on one's own and between students, providing unlimited scenarios for personal development. Skill-play is a fun activity, which directly affects the happiness of its students.⁴⁶

Conclusion

Skill-play, when integrated into curricular and extra-curricular activities, provides a comprehensive range of benefits and tangible positive effects for school students, complimenting all endeavours throughout development – academic, physical, social and personal.

Intellectually, skill-play develops fundamental cognition as well as academic appreciation, ability and performance. It also provides physiological benefits, such as fitness, ambidexterity, coordination and physical awareness. Psychological benefits include development in dual brain activity, and anatomical development in specific regions of the brain. Skill-play activities are a socially equal and inclusive

alternative to conventional competitive sport for students of all backgrounds and experience. It develops trust, respect, communication and cooperation within and around the group. Skill-play also has various positive effects for students with learning difficulties, behavioural problems and physical disabilities. It stimulates personal and emotional development through improvements in self-confidence and self-esteem, without any negative stigma attached to failure. New skills are cumulatively and continually reinforced through perpetual encouragement, thus, students inevitably achieve and succeed.

These benefits provide a strong case for inclusion of skill-play as a curricular and extracurricular activity over the existing long queue of physical education and classroom options. The field of skilled juggling apparatus is still largely unexplored and there is room for further study, particularly into benefits for learning abilities, disabilities and associated improvements in academic performance. Nonetheless, as demonstrated above, skill-play education provides a culmination of benefits for students, through development, growth and skills that are likely to stay with students all their lives.

Notes:

- ¹ Truzzi, M., 1979, "On Keeping Things Up in the Air" in *Natural History*, Vol. 88 No. 10
- ² Bolton, R., 1999, "Circus as Education" in *Australasian Drama Studies*, Vol 35
- ³ *Ibid.*
- ⁴ Truzzi, 1979, "On Keeping Things Up in the Air"
- ⁵ Lewbel, A., 2002, *Research in Juggling History*, <http://www2.bc.edu/~lewbel/jugweb/history-1.html>, Accessed 09/05
- ⁶ Bolton, 1999, "Circus as Education"
- ⁷ *Ibid.*
- ⁸ *The Case for Juggling* – teachers' reports, <http://www.icanjuggle.com/caseforjuggling.html>, Accessed 09/05
- ⁹ Bolton, 1999, "Circus as Education"
- ¹⁰ Barden, A., *The Benefits of Juggling*, <http://www.andrewbarden.com/BenefitsOfJuggling.htm>, Accessed 09/05. and *The Physics of Juggling*, Curriculum guide, <http://www.chs.k12.nf.ca/web2003/courses/scitech/p3204/STSE%20Juggling.pdf>, Accessed 09/05
- ¹¹ Finnigan, D., *The Benefits of Learning to Juggle for Children*, <http://www.learnjuggle.net/benefits.htm>, Accessed 09/05
- ¹² *The Case for Juggling*, <http://www.icanjuggle.com/>
- ¹³ Delisio, E. R., *Teachers Link Juggling to Improved Academic Skills*, 2002, Education World, http://www.educationworld.com/a_curr/curr393.shtml, Accessed 09/05
- ¹⁴ Woodhead, P., personal communication, Physical Education Teacher at Dubbo West Primary School. 21/09/05
- ¹⁵ *Ibid.*
- ¹⁶ Delisio, *Teachers Link Juggling to Improved Academic Skills*, 2002
- ¹⁷ Finnigan, D., *The Benefits of Learning to Juggle*
- ¹⁸ Smith, C., c.f. Finnigan, *The Benefits of Learning to Juggle*
- ¹⁹ Finnigan, D., *The Benefits of Learning to Juggle*
- ²⁰ *Ibid.*
- ²¹ *Ibid.*
- ²² Woodhead, P., personal communication
- ²³ *Ibid.*
- ²⁴ Finnigan, D., *The Benefits of Learning to Juggle*
- ²⁵ Goodman, c.f. Delisio, *Teachers Link Juggling to Improved Academic Skills*, 2002
- ²⁶ Thompson, S., *Physical Benefits of Juggling*, Jugglingworld, <http://www.jugglingworld.biz/performances/benefits-of-juggling-physical.html>, Accessed 09/05
- ²⁷ Finnigan, D., *The Benefits of Learning to Juggle*
- ²⁸ *Ibid.*
- ²⁹ *Ibid.*
- ³⁰ Bolton, 1999, "Circus as Education"
- ³¹ Finnigan, D., c.f. Delisio, *Teachers Link Juggling to Improved Academic Skills*, 2002
- ³² Draganski, B., May, A., et. al., 2004, "Neuroplasticity: Changes in grey matter induced by training", *Nature*, 427, pp 311-312 (22 January 2004)
- ³³ Woodhead, P., personal communication
- ³⁴ *The Case for Juggling*, <http://www.icanjuggle.com/>
- ³⁵ Finnigan, D., *The Benefits of Learning to Juggle*
- ³⁶ *Ibid.*
- ³⁷ *Ibid.*
- ³⁸ "Paul Woodhead - A whole new spin", *Vibe School Teacher of the month*, http://www.vibe.com.au/school_new/teacherofmonth/index.asp?teachid=10, Accessed 09/05
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- ⁴⁰ *Special Populations*, <http://www.icanjuggle.com/specialpopulations2.html>, Accessed 09/05
- ⁴¹ Woodhead, P., personal communication
- ⁴² *The Academic Benefits*, <http://www.icanjuggle.com/academic.html>, Accessed 09/05
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- ⁴⁴ *Ibid.*
- ⁴⁵ *Ibid.*
- ⁴⁶ Delisio, *Teachers Link Juggling to Improved Academic Skills*, 2002