

## GAME FOR LIFE FRAMEWORK

### NGEE ANN POLYTECHNIC IMPACT ANALYSIS REPORT

#### Introduction

Research shows that with age, there is a significant decline in physical activity (Mechelen et. Al., 2010). Most students in Singapore stop participating in sporting or fitness-related activities after secondary or junior college as there is no longer mandatory PE programmes at the tertiary level except for selected institutions. To ensure that students stay active, Ngee Ann Polytechnic (NP) in this instance has a mandatory Sports & Wellness (S & W) Module for their year 1 students. As an advocate of the power of sport to develop students holistically, NP decide to partner with SportSG to implement the GFL framework in their S & W Module as part of an intentional design effort to inculcate values through their lessons.

Beyond just the S & W lessons, NP and SportSG also hoped to uncover whether intentionally designed sport lessons can positively influence objective indicators such as academic performance, disciplinary records, scholarship and academic awards. An impact analysis study was undertaken as part of GFL implementation.

#### Training Evaluation model

The impact analysis was grounded on Kirkpatrick's well-established four levels of training evaluation model (Kirkpatrick & Kirkpatrick, 2006), which is a generic measurement model that describes training effectiveness in terms of how individuals reacted, learnt, applied and demonstrated results as a result of receiving training. Figure 1 illustrates the application of Kirkpatrick model in this study.

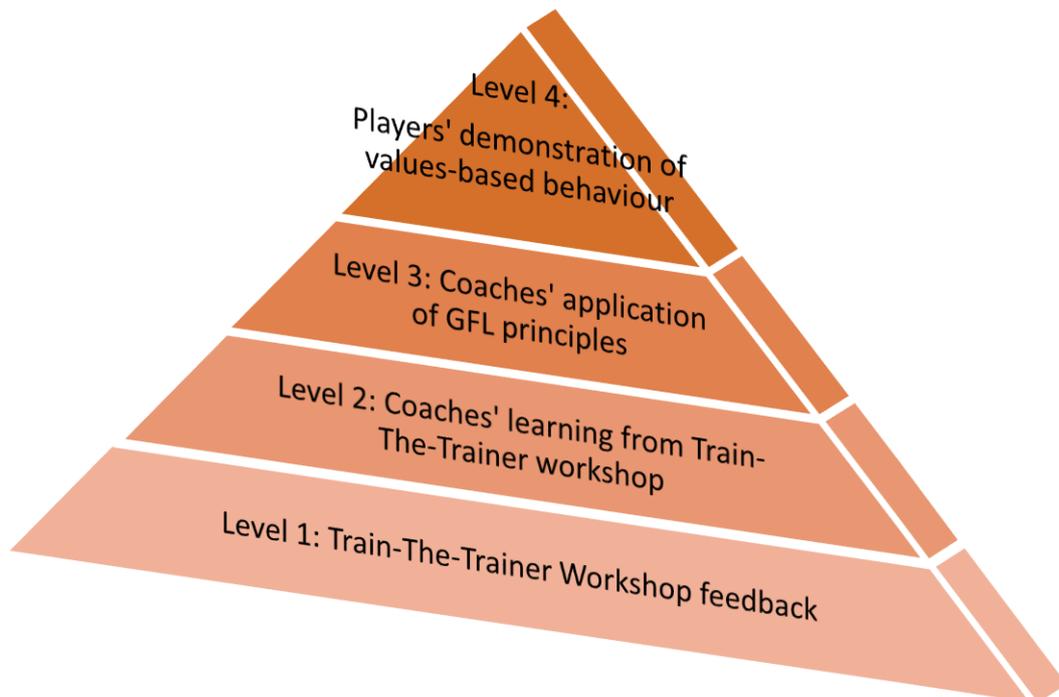
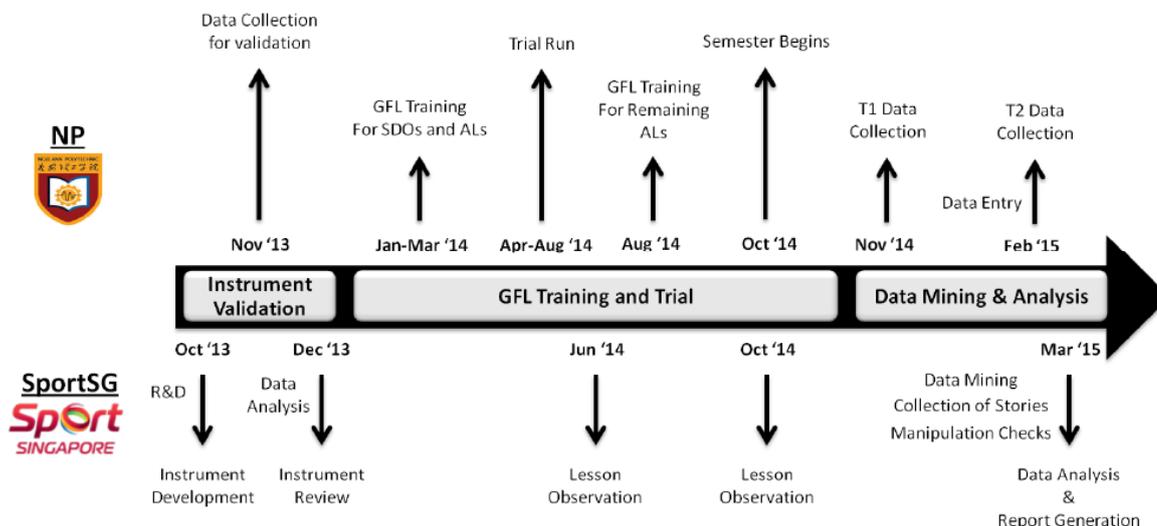


Figure 1.0

## Research Design

A comprehensive pre-post research design was established. Coaches from different disciplines were trained in implementing GFL and how to intentionally design sport lessons for values incultation over 3 sessions. The coaches are from disciplines such as football, badminton, tennis, hip-hop dance and yoga. Three hundred and sixty-nine first year NP students (n=369) took part in this study.



## Hypothesis

If the framework is effective, it is expected that:

Hypothesis 1: Students demonstrate values-based behaviours more frequently at time 2 than at time 1 during S & W lessons

Hypothesis 2: Positive co-relation between the implementation of GFL in S & W lessons on objective indicators such as academic performance, disciplinary records, scholarship records and academic records

## Instrument Validation

### Design of pre-intervention survey forms:

A survey was designed to collect immediate feedback (level 1) and learning from coaches (level 2) (Kirkpatrick and Kirkpatrick, 2006). This measure is meant to ensure that student development officers (SDOs) and associate lecturers (ALs) who are delivering GFL-infused S & W lessons, took away learnings for the successful application of the GFL framework.

### Design of Impact Analysis Instrument:

A pre and post survey was designed to measure students' perception of coaches' (level 3) intentionally designed lessons (GFL framework principles) and students' self-assessment of their values based behaviours (level 4) (Kirkpatrick and Kirkpatrick, 2006). Items of the instrument were adapted from Prosocial and Antisocial behaviour in Sport scale (Kavusannu and Boardley, 2009). These items were further contextualised to measure the NP's school values (respect, responsibility,

resilience, integrity, compassion and gratitude, utilizing a 5 point Likert scale (i.e. 1 = Never to 5 = Very Often). The instrument has a total of fifty-three items.

Ninety-one first year NP students (n=91) were selected to take part in the instrument validation exercise. This exercise was done prior to the rollout of the instrument to ensure that the items were adequately contextualized to their background and able to measure values accurately over time. The instrument was also tested for its reliability.<sup>1</sup>

### **Data Collection and Ethics Considerations**

Students were briefed prior to taking part in the study on issues of confidentiality and informed consent. They were informed that all data received from each individual would be kept confidential and information shared with the school would only be at the aggregate level. Students were also aware that the research was entirely voluntary and were welcome to withdraw from the study at any point.

All surveys were administered via NP's student online portal platform. Data was collected at the beginning of the semester (T1) and the process repeated again when the semester ended (T2). All collated study was compiled and provided for SportSG for further analyses.

The Statistical Package for Social Sciences (SPSS) 22<sup>nd</sup> Edition was utilised for the various levels of quantitative analyses. In addition, five lecturers and eight students were selected for interviews after their participation in GFL-infused S & W lessons. The interviews were meant for capturing anecdotes, key takeaways and memorable experiences throughout the course of the semester.

### **GFL Training**

2 runs of training were conducted to prepare Sport and Wellness lecturers that include Student Development Officers (SDOs) and coaches. Additionally, SportSG also conducted lesson observation exercises to ensure that SDOs and coaches had the guidance required to deliver appropriate GFL-infused lessons.

### **Quantitative Results**

Hypothesis 1 predicted that students demonstrate values based behaviours more frequently at time 2 than at time 1 during S & W lessons.

Overall, results revealed there was an increase in the frequency of the coaches application of framework principles at T2<sup>2</sup> than at T1. This meant that students felt coaches were more frequently teaching values through S & W lessons by demonstration of how certain values can be exhibited in the activities and reinforcing of positive behaviours. See Figure 1.1 for graphical representation of the results.

---

<sup>1</sup> Cronbach's Alpha and Exploratory Factor Analysis (EFA) were conducted to test for scale reliability and factor structure.

<sup>2</sup> A repeated measures T-test was performed. Results were significantly different, T1 mean = 3.44 and T2 mean = 3.80 (t = -9.98, p < .001). When 2 means are significantly different from each other, it is interpreted that there is 95% confidence that the difference between the 2 means are not due to chance

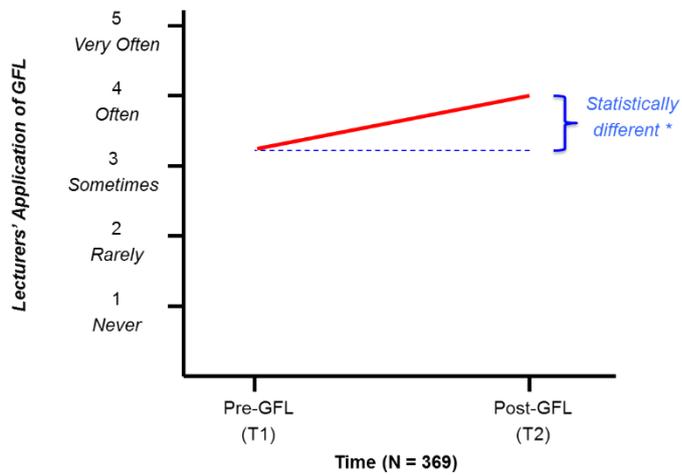


Figure 1.1

Results also revealed a significant difference in students' demonstration of values-based behaviours between T1 and T2<sup>3</sup> with students perceiving themselves to demonstrate significantly more behaviours related to NP's core values during their lessons. Please see Figure 1.2 for graphical representation of the results.

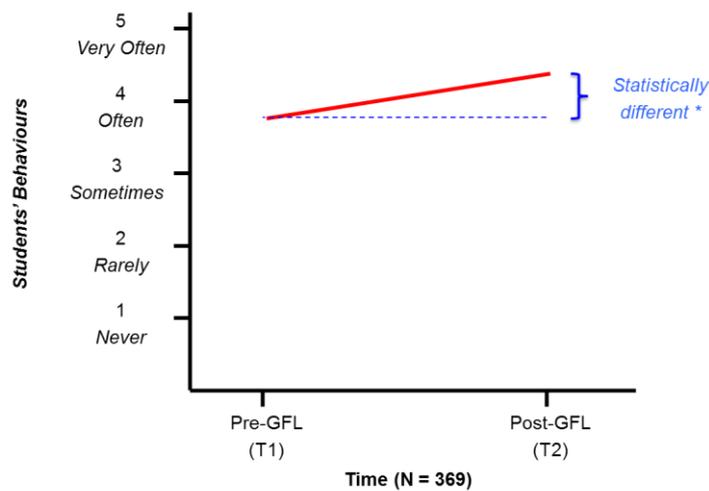


Figure 1.2

### Skill & Enjoyment vs Values Inculcation

An analysis was performed to explore the relationship between skill development, values inculcation and enjoyment. Results revealed a positive relationship between skill development, enjoyment of lessons and S & W coaches application of the GFL framework.<sup>4</sup> This meant that the more frequently coaches facilitated GFL, the more the students enjoyed and learnt more skills during the lessons.

<sup>3</sup> A repeated measures T-test was performed. Results were significantly different, T1 mean = 3.98 and T2 mean = 4.12 ( $t = -7.65, p < .001$ ).

<sup>4</sup> A Bivariate Correlation was performed. Strong, positive correlation reported ( $r = .601, n = 369, p < .001$ ).

## Sport vs Wellness

Analysis was also performed to study the impact of GFL on sport vs non-sport activities (wellness) which revealed there was no significant differences between students' demonstration of values based behaviours whether they took part in sport or wellness activities<sup>5</sup>. This meant that GFL was effective at encouraging demonstration of values based behaviours in both sports and wellness activities.

### **Qualitative Results**

In view of the application of GFL principles in Sports and Wellness modules, interview responses from both Sport and Wellness lecturers and students provided supportive evidence of an understanding and increased application of focus of values and attributes.

### Application of GFL framework during Sports and Wellness Modules

Lecturers agree that the framework provided a structured approach to instil values through sport. Badminton, gym and football lecturers echo similar sentiments that the framework provided a more systematic approach in designing values inculcation through their respective sport. Interview responses from the S & W lecturers and students provided supportive evidence of an understanding and **increased application of focus on values and attributes with a purposeful action plan during lessons.**

To emphasize the value of resilience, the gym lecturer successfully reinforced the need for active participation. This led to students encouraging each other to give their best for each session so as to complete all the activities tasked to them. One particular student who had never lifted weights before in her life, showed promising signs of progress; gaining 12kg of muscle and confidence she never knew she had. The student attributed her success to the lecturer who taught her not to give up in the face of challenges. The reinforced importance of active participation also led to her fellow students who encouraged her to persevere and rise above her own perceived limitations.

In the case of a Hip Hop lecturer, he felt that GFL provided the necessary framework and structure needed to readily design values-infused lessons with greater ease and also identify key learning outcomes. The C.A.R structure also enabled him to take deliberate actions required to achieve those outcomes. In Hip-Hop, the habit of looking into the mirror is important to check on one's technique. The Hip-Hop lecturer effectively applied the framework to reinforce this practice and taught his students the importance of taking responsibility for their actions. A by-product of this reinforcement during lessons was the increase in punctuality of the students. The students when interviewed, noticed there were more explicit teaching of values during lessons.

There is also a marked improvement in **students' demonstration of values based behaviours.** Behaviours picked out from the students revealed more exhibition of values such as respect, discipline, teamwork, responsibility and resilience.

In the case of gym students, they felt motivated by the encouragement of their lecturers to not give up easily. The lifts do get easier as they persisted. They also learnt responsibility through the awareness of gym etiquette to wipe down the bench after use. Eventually students reminded each other to bring their personal towels.

---

<sup>5</sup> An independent samples T-test was performed. Results were not significant (Sports mean = 4.15, Wellness mean = 4.08,  $t(367) = 1.38$ , n.s.).

In the area of sport/rock climbing, the students were taught the importance of responsibility through roles learning. The belayer was taught to exhibit behaviours associated with responsibility to ensure a safe climb for the climber. Initially, the students were unwilling to cooperate with the lecturer such as checking through equipment with a fellow classmate. However as lessons progressed, there was marked improvement as compared to the beginning and eventually students started to help lecturers in the preparation of equipment before each lesson. Where asked if such learnings during their S & W lessons helped other areas of their life, they replied that it enabled them to be more disciplined and willing in attending their academic classes on a day-to-day basis.

### **Limitations And Recommendations**

One limitation of the current study is that of time to measure sufficiently the impact of participation that GFL infused S & W lessons have on students over the course of their student life in NP. Objective indicators can be measured in more detail such as academic and non-academic achievements.

Academic performance provided by NP comparing students' grade point averages (GPAs) between Semester One (pre-GFL; Apr-Aug 2014) and Semester Two (post-GFL; Oct-Feb 2015) suggests that students did improve academically. There could be a co-relation between taking part in GFL-infused S & W lessons<sup>6</sup>. To further establish this long term impact, it is proposed that those who took part in this study be tracked over the remaining two years of their time in NP, comparing GPAs obtained each Semester.

Disciplinary records provided by NP shows that seven out of the 369<sup>7</sup> who took part in this study had disciplinary records (eg. playing poker cards or smoking in school). As this is the students' first year in NP, to form a basis for comparison, disciplinary records for year two and three can be recorded and the number of recorded disciplinary incidents be compared against the present figure to measure if there has been any decrease.

Scholarship awards obtained by students over this time showed an increase. 26 students<sup>8</sup> obtained either NP scholarships or external scholarship awards. The co-relation between students' participation in GFL-infused S & W lessons and the attainment rates of scholarship awards could be studied deeper in year two and three to add to the breadth of research related to students' sustained improvement in academic performances after participating in GFL-infused S & W lessons.

Academic awards were obtained by one hundred and twenty students<sup>9</sup>. As with scholarship awards, the correlation between students' participation in GFL-infused S & W lessons and the increase in attainment rates of academic awards could be studied deeper in year two and three.

### **Conclusion**

From the impact analysis study using a pre-post research design, analysis of quantitative data supports hypothesis 1 due to significant changes in coaches implementing framework principles and

---

<sup>6</sup> A repeated measures T-test was performed. Results were significantly different, T1 mean = 3.19 and T2 mean = 3.28 (t = -3.34, p < .05).

<sup>7</sup> 1.90% of study participants.

<sup>8</sup> 7.05% of study participants.

<sup>9</sup> 32.52% of study participants.

players demonstrating more values based behaviours at Time 2 as compared to Time 1. Analysis of qualitative data also revealed evidence of students' experience of S & W lecturers application of framework principles and an increase in values based behaviours of the players with positive narratives of changes that occurred during lessons. Interviews with coaches also revealed their experiences of more frequently and deliberately facilitating values inculcation through their lessons.

The impact analysis to study objective indicators was limited by time. Although there was improvement in academic performance, academic and scholarship awards, the positive co-relation can be more accurately established if more time was provided.

Hence, it is recommended that NP continue to adapt the GFL framework in its S & W lessons to intentionally design lessons to optimise learning and opportunities for values inculcation while taking into account the results of this impact analysis to identify areas of application.

## **References**

Kavussanu, M. & Boardley, I. D. (2009). The prosocial and antisocial behaviour in sport scale. *Journal of Sport & Exercise Psychology*, 31, 97-117.

Kirkpatrick, D. L. & Kirkpatrick, J. D. (2006). *Evaluating training programs: The four levels (3rd Edition)*. San Francisco, CA: Berrett-Koehler Publishers Inc.

Mechelen, W. V., Twisk, J. W. R., Post, G. B., Snel, J., & Kemper, H. C. G. (2000). Physical activity of young people: the Amsterdam Longitudinal Growth and Health Study. *Journal of the American College of Sports Medicine*, 1610-1616.