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A digital game for the enhancement of reflection on materialistic and non-materialistic values

Tak-Yan Lee, MSW, PhD, RSW¹, Daniel TL Shek, PhD, FHKPS, BBS, JP² and Chun-Lam Fan, MAP¹

¹*Department of Social and Behavioural Sciences, City University of Hong Kong, Hong Kong, and* ²*Department of Applied Social Sciences, The Hong Kong Polytechnic University, Hong Kong, PR China*

Abstract: This paper offers a brief review of literature on materialism among adolescents and game-based learning on the promotion of one specific positive youth development construct, namely spirituality as a preventive measure. It then describes the design of the digital game and how it can be used as an electronic resource to enhance learning on reflection of materialistic and non-materialistic values and the development of spirituality and enhancement of self-efficacy in financial management. It also provides suggestions on how to use the game effectively. The discussion is supported by in-depth qualitative and critical comments of two users from different cultures and educational levels. Theoretical and practical issues are discussed. Limitations and future research suggestions are presented.

Keywords: Prevention, positive youth development, spirituality, game-based learning, materialism, digital game

Correspondence: Daniel TL Shek, PhD, FHKPS, BBS, SBS, JP, Associate Vice President (Undergraduate Programme), Chair Professor of Applied Social Sciences and Li and Fung Professor in Service Leadership Education, Department of Applied Social Sciences, The Hong Kong Polytechnic University, Hunghom, Hong Kong, PR China. Email: daniel.shek@polyu.edu.hk

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Introduction

Overemphasis on materialism and high rates of narcissism and overconfidence are some of the common concerns for young people in many developed countries. Most Asian parents believe that their children must enter into a good university so that they will get a good job with high salary. The notion of “hover parents” has been widely accepted by Asian parents. In China, where collectivism is more highly recognized than individualism, similar patterns are observed. In Hong Kong, emphasis on children’s high academic achievement seems to have gone to an extreme that parents “should never let their children lose at the starting point” (1-3). The notion of success held by these parents is rather instrumental and often materialistic. Commission on Youth (4) found that 20-30% of youths would consider using unethical means to achieve what they want which are material orientations based on hedonism, wealth, and sensual stimulation.

When young people value possession and judge success and others by materialistic values, they would consider less on other significant elements of a meaningful life such as moral character and spirituality. They value less in the areas of universalism, benevolence, righteousness, honesty, responsibility, diligence, conformity to norms, cultural tradition, and show less commitment to family, friendship, as well as the community. One plausible explanation is that Hong Kong is a city with strong international connections of finance and trading (5). However, it is disturbing when a significant number of young people would consider using unethical means to achieve their wealth. Against this background, the promotion of a positive concept of money and success as well as material possession is needed and the production of educational resources for educators, teachers and parents are desirable. With the financial support from The Hong Kong Jockey Club Charities Trust, a digital game designed to enhance adolescents’ reflection on materialistic and non-materialistic values was produced.

Literature review

Materialism is a complex concept with various definitions. From the consumers’ perspective, materialism is defined as the desire to pursue goods (6). Belk (7) equated it with three personality traits which include envy, non-generosity and possessiveness. Shek, Ma and Lin (8) further conceptualized it along three dimensions which include, materialistic possessions, acquisition centrality and hedonistic pursuit and developed a test on materialism in the Chinese culture.

The development of materialism in children and teenagers is complicated. Models are constructed to predict materialism including the consumer socialisation model of children (9), materialistic value orientation model and the concept of social comparison (10). According to John (9), the desire for material goods starts in the early age where pre-schoolers request certain type of products and demonstrate their desires through behaviors such as grabbing and begging. Throughout children’s development process, they acquire consumer skills, knowledge, and values that are related to their function as a consumer in the market (9). The model of materialistic value orientation based on the concept of socialization suggests that materialistic values are derived from experiences with the feelings of insecurity and real life examples of materialistic values, beliefs, and behaviors in children’s life (10). When children’s psychological needs are not met, they tend to use material goods to compensate their negative feelings and sense of insecurity (10). In addition, the emergence of material possessions among young people is due to a decline in self-esteem when they enter adolescence at the ages of 12 to 13, giving them a strong motivation to obtain material possession to enhance their self-esteem (11). Chan and Prendergast (12) adjusted the model of materialistic value orientation and the concept of social comparison by replacing insecurity and materialism exposure with social comparison

variables such as family communication, peer influence, peer communication and television viewing as an effort to adapt the model into the Chinese context. The authors further concluded that media figures and social comparison are positive predictors of materialism in the Chinese youth population (12).

Concerns for materialism in adolescent are increasing. Youth materialism, meaning owning luxury goods and the importance of money, has increased over generations of 12th graders in America between 1976 and 2007 due to the popularity of advertising (13). 95% of adults in American agreed that children are attracted to shopping and about 80% of adults believed that regulations on advertising to children are needed (14). In the United Kingdom, a phenomenon that parents frequently buy goods for themselves and their children is observed, while such a phenomenon is not found in Spain and Sweden (15). Interestingly, it was observed that the levels of materialism among children to early adolescence are at the highest and then they decrease afterward (11). Comparing children and adolescents with poor and affluent backgrounds, underprivileged children aged between 8 to 10 years old exhibit similar level of materialism as compared to their wealthier peers, but the impoverished teens are more materialistic than their rich fellows when they enter inter adolescence (13).

The perception of materialism is not only found in the west, but also in the east. A study of young consumers in both the United States and China concluded that materialism is cross-cultural as both samples demonstrated similar results in the questionnaire items related to materialism (16). In another study, Chinese youth tend to be more materialistic when they grow up because of high parental material success expectations due to the one child policy (17), whereas young people in the U.S. reduce their levels of materialism after the peak at early adolescence (11). Unlike the situation in western countries, television programmes have no effect on materialism in children and teenagers because China has restricted rules on media contents (17). In Hong Kong, adolescents are living in an environment that emphasizes money and material possession. In a metropolitan that focuses on economics and finance, adolescents in Hong Kong develop and maintain their materialistic values (5). Although Children in Hong Kong do not show excessive level of materialism, they understand the value of possession as young as six years old (18). Chan (18) further found that younger children with more pocket money are more materialistic, and the effect of television on materialism depends on the perception on advertisements of children and adolescents.

The concept of materialism is associated with individual's physical and psychological well-being as well as academic performance. A study found that young adults who focus on money, popularity and reputation are more likely to be depressed and report to have experienced physical symptoms such as headaches, sore muscles and backaches (19). Focusing on money drives individuals to spend more time at work and less time with friends and family, negatively affecting the level of happiness (20). Psychological needs satisfaction is undermined by materialism, leading to a decrease in psychological well-being and an increase in depressive symptoms (20). Moreover, those reported with strong materialistic value experience more negative emotions, and thus distanced themselves with positive life constructs which include competence, autonomy, gratitude, and meaning in life (21). Materialistic youth who have a habit of spending and saving little are more likely to be excited by new products in advertising. They report school as less enjoyable, and have poor academic performance (22).

In order to facilitate positive development in children and adolescents, minimizing the influence of materialism is crucial. In fact, materialism has become a major concern in both developing and developed countries. Scholars suggest some intervention directions to reduce the

level of materialism in children and adolescents as improvement in their well-being is observed if the degree of significance of materialistic value and goals decreases (23). Self-esteem has been proved to be associated to materialism. A study by Liang et al (24) found that increasing self-esteem results in a low level of materialism and reduced corrupted intention. Meaning in life and psychological well-being are highly correlated in adolescents that meaning in life is a potentially protective factor of materialism (25). Similarly, another study demonstrated a positive association between meaning in life with well-being, academic adjustment, self-esteem, ethnic belonging and exploration (26). A normative developmental characteristic during the adolescence period helps the development of spirituality in teenagers, building resilience to challenges in puberty (27). Chaplin et al (28) suggested promoting sense of gratitude in adolescents and children to reduce materialism as those who are grateful with what they have are less materialistic. Based on the previous findings, the design of the digital positive youth development (DPYD) game tackles the aspect of meaning in life to enhance spirituality and promote resilience in adolescents towards materialism.

With increasing recognition of the importance of well-being, many schools promote positive well-being among students on top of the acquisition of skills and knowledge (29). The digital game described in this paper is designed to promote one of the positive youth development constructs, namely spirituality. It is intended to promote early adolescents' well-being through reflection on both materialistic and non-materialistic values with game-based learning (GBL). Gaming environment promotes both learning and motivation to learn, allowing students to participate actively in the learning process (30).

As part of the effort in updating teaching and learning materials for the project P.A.T.H.S. (31), a digital game named "Live a meaningful life" was designed and produced in 2015 to support teaching on the construct of spirituality through prudent financial management and reflection on the meaning of life. Digital GBL on financial literacy is popular nowadays due to rapid advancement in information and communication technology (ICT). A study on digital learning game and financial literacy education has found that well-designed and instructionally integrated digital games can motivate players to learn financial management knowledge (32). In the United States, an online financial game named *Gen i Revolution* (Council for Economic Education, n.d.) was developed to educate students the importance of personal finance skills (33) for high school students. Over 120,000 students have played the game to acquire knowledge (33). Other games such as Financial Football and the Visa's Practical Money Skills platform were designed to serve a similar purpose, i.e., teaching children and adolescents about money concept (34). Our game is designed with similar purpose for students in Hong Kong, adopting the idea of "Edutainment".

Theoretical underpinnings of the game

The name of the game is "Live a meaningful life." It is targeted at Secondary 2 (Grade 7) students. Its design is based on the framework on money literacy for children and adolescents (35) which was inspired by Potter (36) effort on media literacy and research on education on personal finance and economics as well as the developmental and cultural characteristics of children and adolescents. The framework is built on two levels: foundation and advanced. The former is composed of three components, namely, narrative acquisition, cultivation of traditional value, and developing scepticism. The advanced level consists of experiential exploring, critical appreciation, and social responsibility. The six-stage model (35) covers from developing an awareness of differences between needs and wants to disputing beliefs about materialism and

hedonism for the foundation level; and for the advanced level, from searching for gratification and fulfilment from new experiences, which include emotional, moral, aesthetic, and sports activities to recognizing what one can do to contribute to society positively.

Based on the framework, cognitive, affective, value judgement, and behavioral dimensions are covered in the game. For the cognitive dimension, the game covers “desire to gain money”, “money as a symbolic meaning of power”, “cautions in using money”, “money is not the only criterion to determine success or failure”. For the value judgment domain, it includes reflections on whether “money has a symbolic meaning of good or bad” and “personal spending”. On the affective dimension, the game encourages making contribution to support family and society through donations”. Finally, on the behavioral dimension, the game requires players to conduct monthly personal financial management which will, to a large extent, determine whether the player will win one of the four awards, namely, the “Individual Award” (the largest positive balance of good moral character cards); the “Family Award” (who has the largest amount of money by adding savings, remainder of investment, the total amount of family expenses times two, and cash-on-hand together); the “Donation Award” (the highest donation ratio); and the “Social Contribution Award” (long-term social benefits generated from personal donations). The game is designed to help students examine such elements in their lives.



Figure 1: The front page of the game “Live a meaningful life” (2015).

The time needed to finish the game is around 10 to 30 minutes depending on the number of rounds chosen by students. Throughout the game, students experience randomly different life circumstances, which are mostly uncontrollable. In this way, the game shows what real life can be and it is hoped that students can reflect on the meaning of life with the help of the instructors. They are also encouraged to learn to make personal financial decisions wisely in order to stay on the game and get awards in the end. Feedback is provided for players at the end of the game so

that they can learn how to make better decisions and come up with other effective strategies to compete for the awards in the next round of the game.

Objectives

The game is designed to enhance students' reflection on personal values through discussing materialistic and non-materialistic values as well as the definition of a meaningful life. The objectives of the game are three-folded. First, on the cognitive aspect, students can understand their own view on financial management and have chances to practice it in the game. They can reflect on the values and meaning of life when making the decisions of how to allocate their salary in different categories such as family expenses and donation. Second, on the affective aspect, students can enhance their emotional competence in facing life issues beyond their control; and enhance their levels of empathetic competence and care for their community through experiencing the lives of different social classes. Finally, on the behavioral aspect, students can apply prudent financial management skills in the virtual reality. This will be a great learning experience for students, who may not have experience on how to manage their money on the whole in real life situations.

The purpose of the game is to let students understand that some things are beyond our control in life, such as one's origin and a financial tsunami. However, students could develop good moral character, learn prudent financial management skills, engage in careful decision making processes, show more concerns toward society, and make donations, which are the crucial elements of a decent and meaningful life. This teaching material is designed for a teaching unit, MS 2.3 'A meaningful life'. The objectives are to help students to understand that good moral character is essential in leading a meaningful life; and sensible and smart financial management is important skills for managing life. The unit focuses on the construct of spirituality and self-efficacy.

Game design

The physical design of the game is very similar to the board game 'Monopoly'. Players are allowed to choose their gender and the number of rounds at the beginning of the game. They will be assigned a social class with a fixed amount of monthly salaries randomly by the game. Lower class with \$10,000; middle-class with \$20,000; and upper class with \$30,000. The game will also generate three virtual players with different genders and social classes to join the game simultaneously. Players can see them at the lower right corner of the screen. At the beginning of the game, a fixed amount of rent will be automatically deducted from the salary. The player has to decide how to distribute his/her remaining salary to the following items: personal consumption, savings, investments, family expenses, and donations. The remaining amount of cash-on-hand will be shown, and it is a crucial factor to determine if the player can carry on with the game. The player starts the game by throwing a dice and the icon of the player will move according to the number of steps shown on the dice. He/she has to decide how to use the salary every time when passing through the starting point on the board. The game is over when the amount of cash-on-hand is in deficit or the player has completed the number of rounds she/he chooses to play at the start of the game.

Throughout the game, players will have the opportunities to get good or bad moral character cards, which include kind-heartedness, diligence, contentment, health, family warmth, craving for knowledge, selfishness, laziness, greediness, criminal record, jealousy, arrogance, etc. Players will be given an award when the number of good moral character cards are more than the

bad ones. In addition, there are four awards: The Individual Award will be given to the player who has the largest positive balance of good moral character cards; The Family Award to the one who has the largest amount of money by adding savings, remainder of investment, the total amount of family expenses times two, and cash-on-hand together; the Donation Award to the player who has the highest donation ratio; and lastly the Social Contribution Award to the one who has long-term social benefits generated from his/her personal donations.

Teaching and learning method

The teaching material is designed for a single user. It randomly assigns a social class to the player, who will virtually experience different life circumstances and unexpected changes that are mostly beyond their control such as accidents, change of economic environment, etc. On one hand, the players learn to use their monthly salaries through careful budgeting and planning. On the other hand, they are introduced to the significance of non-materialistic elements of life which include moral character, care for others, and contribute to society through donations. The game provides feedback to students on how to use money wisely and encourage them to search for the meaning of life at the same time.

Teaching and learning strategy

Instructors can introduce and demonstrate the game in class or during an assembly to arouse curiosity and interest in playing the game. Students can play the game in class or at home depending on the availability of time during lessons in school. Instructors are encouraged to focus on the reflection of the meaning of life, money and success, personal financial management, and the feedback provided at the end of the game with students. Social workers and counsellors can also use the game for group or individual counselling, especially for those who are weak in financial management or who over-emphasize materialistic values.

Besides, instructors can make good use of students' curiosity and interest in organising competitions in order to enhance the learning outcomes. In this way, students become more engaged and they can discuss as a group to win certain awards in the game. Since students will be assigned a different status at the beginning of the game, they have to employ different strategies in personal financial management. Students might complain it is not fair that they are given the low social status most of the time while others are often lucky to have a high salary. Instructors can make use of some post-activities discussion on issues related to money and success, and the meaning of "being a winner" with students as they have gained some learning experiences through the game. Instructors should encourage students to try to get non-monetary awards such as the Individual, Donation, and Social Contribution Awards. This could provide food for thought to help students reflect on their own values and encourage a reflection on the meaning of life for students. Finally, instructors may remind students to use the print-screen function to save their personal financial management table for review purposes. In that way, they can review and analyze their practice of personal financial management, and initiate some discussion with their peers regarding strategies to win awards.

Tips for instructors

Instructors need to explain to students about each item of expenditure and what are supposed to be included in the item. Most students lack the concept of running a family and do not understand much about budgeting within a household. For example, family expenses usually include all the bills like rent, water, electricity, internet fees, food, transportation, medical bills,

etc. Activities such as donation to support a good cause and assist the less fortunate groups in the community is encouraged by giving two awards to players who regularly donate. If students have allocated an amount of donation, they will get a Card of Kind-heartedness automatically when they pick a surprise card that praises their willingness to help. On the contrary, overspending on shopping can cause 50% of one's salary if one picks a surprise card. All these can be used for teaching points at the end of the game with students. They need to be careful about making purchases and instructors can bring up the possible "traps" of using credit cards and the high interest rate it incurs if one cannot repay the amount owed. There are plenty of areas instructors can discuss with the class such as the topic of "Spiritual Wealth" and its meaning. Positive behaviors will be rewarded like the value of hard work with a bonus of one-month salary when players land on the "work hard" square; and a card of arrogance is given when students land on the square of being overconfident. Instructors can encourage students to discuss the values and meaning of life using the materials provided in the game.

A digital game for the project P.A.T.H.S.

To promote the holistic development of junior secondary school students in Hong Kong, the project titled "P.A.T.H.S. to Adulthood: A Jockey Club Youth Enhancement Scheme" was launched in the 2005/2006 school year. It is a collaboration with the research team involving scholars from five universities, the Social Welfare Department, and the Education Bureau (formerly the Education and Manpower Bureau). The project P.A.T.H.S. has been recognized as one of the evidence-based programs that apply prevention science (37) using 15 constructs identified as core components of positive youth development (PYD) (38).

Construct and related teaching units

This game unit focuses on the construct of spirituality and self-efficacy. It is related to three teaching units of the project P.A.T.H.S. on the same theme "Money and success" (MS) designed for Secondary 1 and 2 (Grades 7-8) students. They are:

MS 1.1 "I Believe I Can" (Objectives: to recognize one's self-efficacy in social, living habits, academic study, appearance, and financial management; and to understand that many essential abilities cannot be developed just with money. This unit focuses on the construct of self-efficacy).

MS 1.2 "The Value of Life" (Objectives: to reflect on materialistic values and to down play those values while helping students explore the value of life. This unit focuses on the construct of spirituality).

MS 2.4 "The Story of a Cycling Boy" (Objectives: to understand the importance of spiritual satisfaction and to reflect on the value and the meaning of money in life. This unit focuses on the construct of spirituality).

Concept map

Concept map of MS 1.1 "I Believe I Can" is presented below.

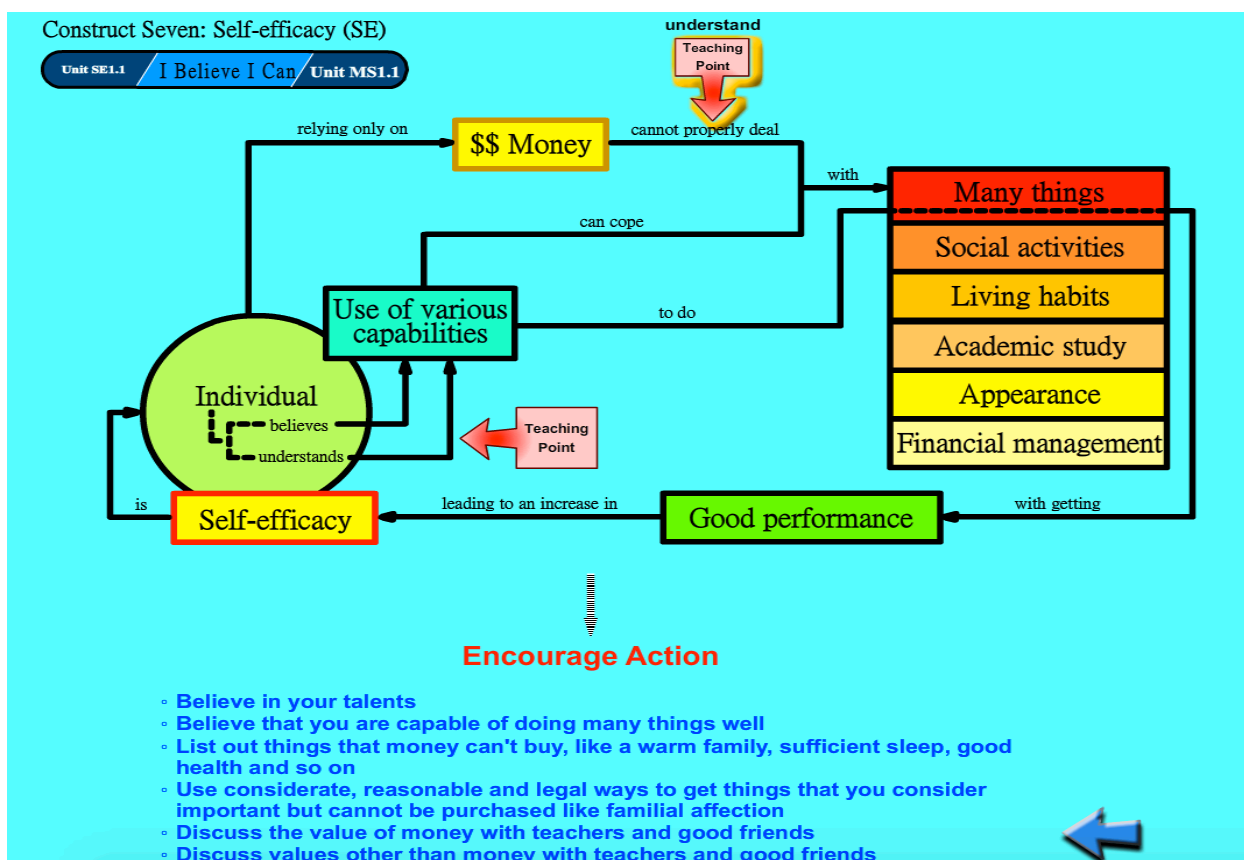


Figure 2. The concept map of MS 1.1 “I Believe I can”

Teaching points for MS 1.1

Instructors can lead students in the process of understanding and believing that we cannot develop many of the essential abilities with money, and we cannot rely only on money to deal with things properly in our daily lives such as our academic study and cultivation of friendship. Instead, we need to recognize one’s self-efficacy in social, living habits, academic study, appearance, and financial management, and use one’s capabilities to cope with one’s day to day issues. When students have good performance, their confidence and self-efficacy will be enhanced. Thus, it will reinforce our coping capabilities when we are dealing with different issues in life.

Students are encouraged to believe in their talents, trusting that they are capable of doing many things well. Instructors can discuss with the class about the value of money, and list out things that money cannot buy, such as a warm family, sufficient sleep and good health. We can use considerate, reasonable and legal ways to obtain things that we deem important, but these are the things that cannot be purchased such as good friends and affection from others. Instructors can encourage students to discuss the value of money and other things with teachers, family and good friends to generate more constructive discussion on the issue.

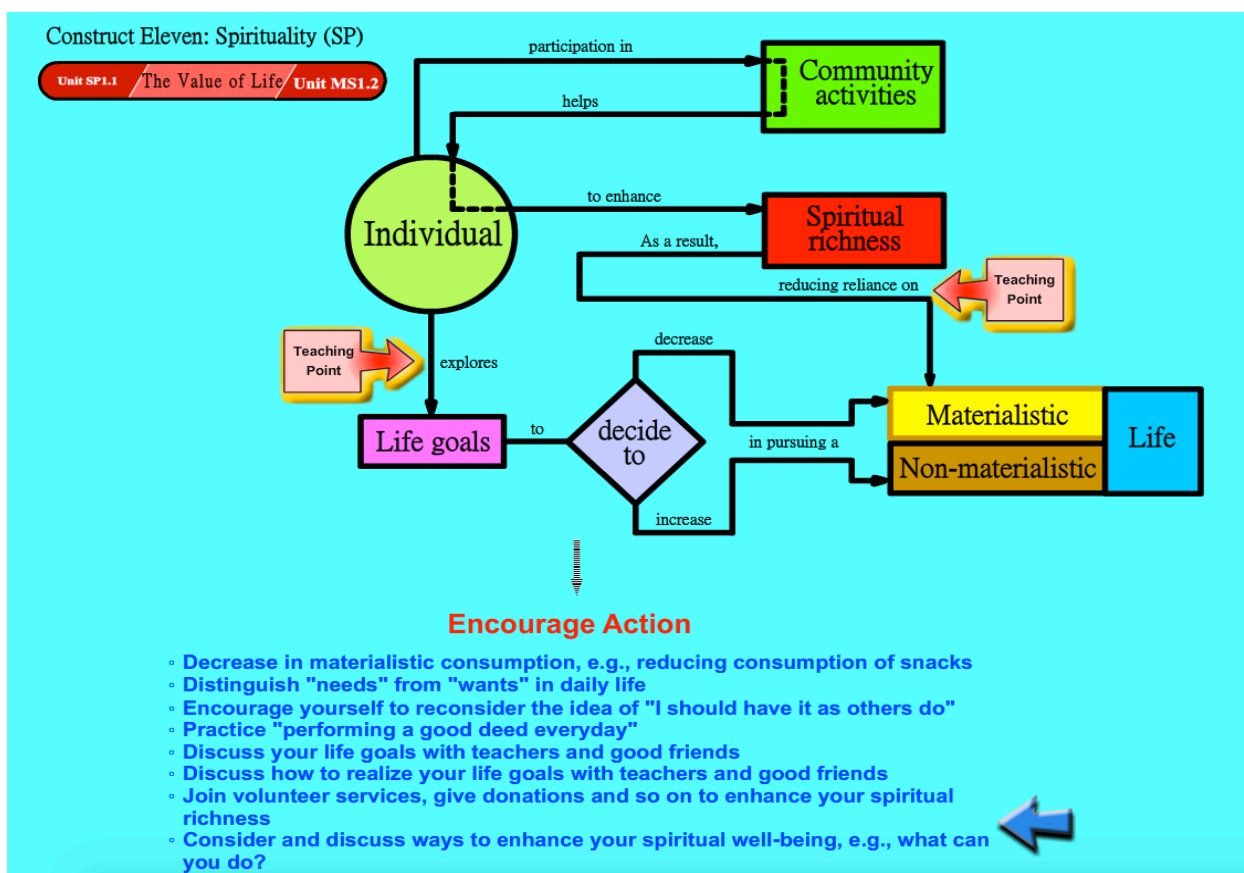


Figure 3: The concept map of MS 1.2 “The Value of Life”

Teaching points for MS 1.2

The unit targets at students who are at the age of exploring the meaning of life and their life goals. Some might start exploring different kinds of life style which will lead to a different outcome. Should they pursue a more materialistic or non-materialistic life? Instructors can highlight the importance of participation in community activities such as volunteering in community projects, shelters for homeless or senior centres. It helps enhance a sense of spiritual richness in students and as a result, it reduces their reliance on material goods for satisfaction, fulfilment or accomplishment. In fact, those feelings are short-lived and instructors can draw on personal experiences and real life examples to illustrate the point.

Students are encouraged to discuss what their life goals are with their teachers and classmates, and think about how they can achieve those goals. At the same time, instructors should help students to distinguish “needs” from “wants” in their daily lives, and encourage them to rethink the idea of “getting things because others have them”. Students can form into groups and debate about the reasons for and against the practice of purchasing something because “I should have things as others do”. This can stimulate students’ thinking of the logic behind the idea and come up with a plan to deal with the situation when they want to have something as others do. At the same time, instructors can discuss the value of life with students and remind them of the importance to have a balanced life. For example, students can try to reduce the consumption of materialistic goods such as snacks, clothes and games. Instructors can also encourage students to try practicing a good deed a day, serving voluntary in the community, and finding ways to enhance their spiritual richness. Having a walk in the park, going hiking and

cycling with close friends and family or just helping a senior to carry his/her grocery will be a good start for students' experience in this area.

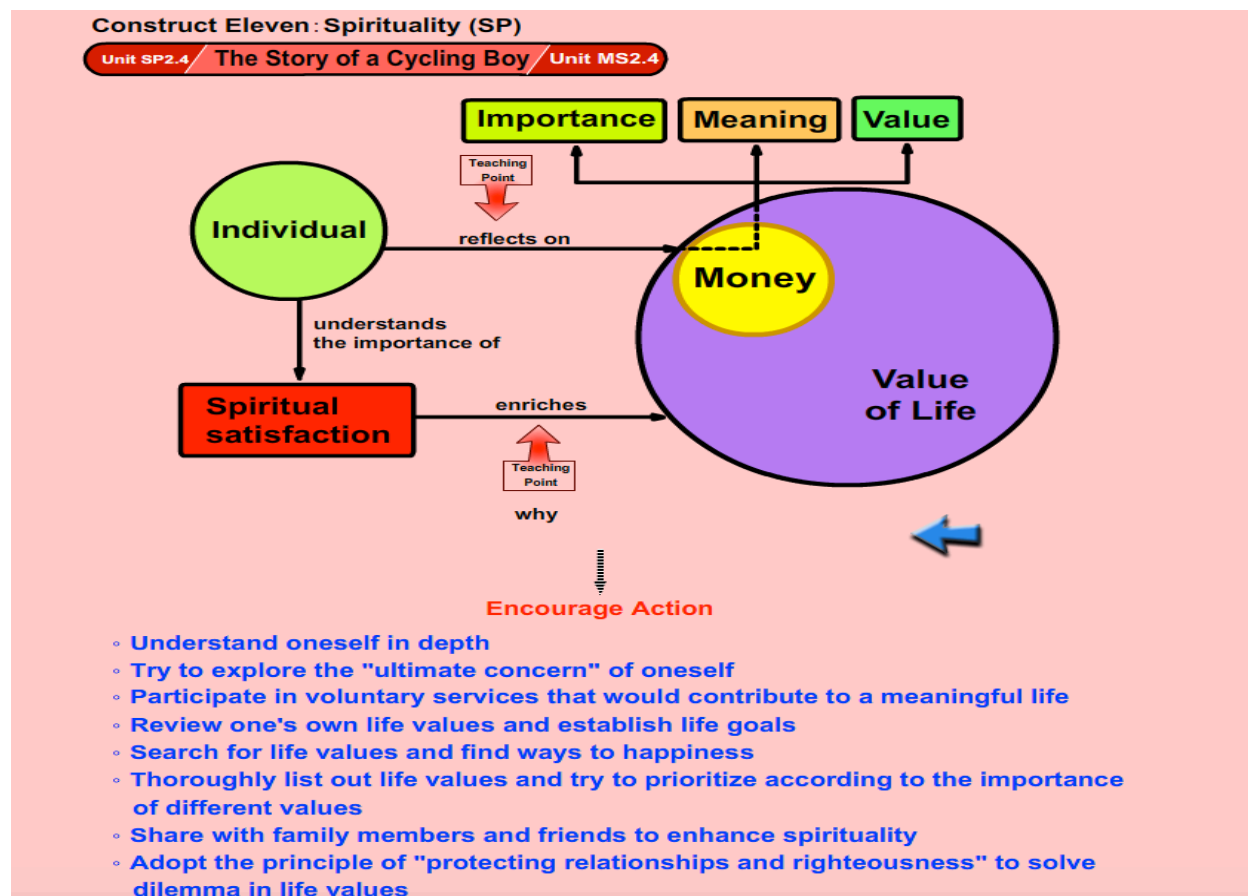


Figure 4: Concept map of MS 2.4 “The story of a cycling boy”

Teaching points for MS 2.4

At the beginning of the story, a person who loved cycling developed a passion for cycling and set a goal of touring around the world. What is the meaning and value of life, and where does money stand in the equation? Instructors can guide students to discuss those questions and reflect on the meaning of money and other values in our lives. Students will be helped to think about the differences between “Material satisfaction” and “Spiritual satisfaction”. Instructors can ask students to share their experiences of both satisfaction and give them feedback accordingly. On the whole, the unit teaches how spiritual satisfaction enriches our lives and helps students understand the value of life which include a broad spectrum other than just money.

It is a golden opportunity for instructors to encourage certain actions in this teaching unit. We need to first understand ourselves in depth and try to explore what our “ultimate concern” is. Instructors can discuss with the class and review their own life values and establish life goals with them. This will facilitate students' search for their life values and ways of happiness. Another exercise they can do is to list out students' life values. Both instructors and students work together to prioritize according to the importance of different values. Students will be encouraged to participate in voluntary services that would contribute to a meaningful life; share their goals with family members and friends and spend more quality time with them to enhance

spirituality. They will adopt the principle of “protecting relationships and righteousness” to solve dilemma in life issues.

Remarks

This game is designed to help students learn some important skills of managing finances, and understand there are circumstances in life where we have no control over. The happiness of life can be achieved by a lot of non-monetary values such as seeking and reaching one’s dreams, helping out in the community, or simply enjoying a quiet afternoon reading on a beach. Everyone has his or her own standard of happiness, students should learn to strike a balance between “Material Satisfaction” and “Spiritual Satisfaction” and should not rely too much on using material goods for happiness. The principles of “Helping others is the origin of happiness” and “Giving is more blessed than receiving” as well as the fact that “Maintaining fairness and promoting equality” can help students themselves and others happy.

User feedback

The following comments were from a 15-year old girl attending an international school in Shanghai. Informed parental consent to play the game and publish her critical comments on the game was secured.

“The game resembles the popular board game Monopoly. Players use an electronic dice to move ahead but have free choices in gender, duration of the game of three, five, or seven rounds, and most importantly managing their monthly income. They will lose the game whenever their accounts (money-on-hand) are in deficit. The game will end when players complete the number of rounds selected.

Positive side

The game embodies a lot of elements in real life such as family, social organization, cultural practices, society, financial management, moral values, and value judgments.

First, the users have a free choice in distributing their salary in how much they are going to use in each aspect (personal consumption, savings, family expenses, and donation). The money remains will be the cash-on-hand. When the cash-on-hand is in deficit, the game ends. Each round, they have a choice to change their decision in how to distribute their monthly salary. This gives the users a good experience in managing their money. Users throw a dice to see how many steps they will move. Therefore, the players have minimal influence on where their chess will stand on. On some places, negative things will happen such as loss of money in investment, sickness, hospitalization and things that will use up money unexpectedly. These resemble the real-life situation that sometimes we need to use money in situations that we do not expect. In this case, students can learn to reserve a slightly higher amount of money for unexpected use. Most importantly, when players find that their money at a round is very close to zero, they will learn to prepare more money for cash-on-hand next time so that they will not lose easily. In this case, students can learn how to save money for unexpected things in real life situation and may not overspend.

Secondly, although the game focuses on how to manage money, it also promotes moral values. The players with the most money in hand can get an award but players who donate a great proportion of their salary, or who have the most good moral character card, or who contribute the most to society can also get awards. This brings out the idea that not only is

earning money important, other aspects such as family, personal warmth, moral values are also important elements in life.

Thirdly, this game is interesting as players may engage in some ups and downs in emotion when they step on rewarding squares and unfavorable squares.

Negative side

First, as cash-on-hand is a crucial factor of the game, once a player's cash-on-hand is in deficit, he/she will lose the game. It is possible that after a few times the players played the game, they may put all or most of the money to cash-on-hand rather than putting them to personal consumption, savings, family expenses, and donation, in the hope of not losing the game rather than thinking of how to distribute the money in a real-life sense. Therefore, an experienced teacher and instructor may help players clarify their aims and targets when they play this game.

Secondly, it is possible that the game cannot promote the correct way of how to enhance familial relationship. Family award is given to the player who has the largest amount of money by adding savings, remainder of investment, the total amount of family expenses times two, and cash-on-hand together. Usually, players who were given the upper-class role will spend more money (not in ratio) in family expenses than the middle-class and the lower-class because they have more money. There are a lot of reasons and ways to achieve a harmonious family relationship. Money is only one of the important factors. Although the aim of the game is not to bring out the idea that money is the most important factor in maintaining familial relationship, the game somehow works in this sense. It is possible that students may neglect other crucial factors which could promote good familial relationship such as time spent with family, tolerance, and understanding.

Thirdly, it is better if some small games that could promote correct values judgment can be added to some squares on the board. If players stop on some certain squares, they will be given some positive or negative moral value cards (e.g. greedy, jealous, hard-working, and healthy). Students may not have a deep impression of those values. It is possible to add some small games or some short questions about the corresponding values on those squares. So if students answered them correctly, they can avoid getting bad cards and get good cards. In this case, students may find it more fun as they have to work or discuss to get good cards and avoid getting bad cards, instead of getting them without doing anything. In addition, the game designer can also instill correct value judgments and moral values to students in those questions.

To conclude, the game is interesting enough to arouse students' motivation to play it more than one time. And, the frame of the game was nicely structured. However, some small changes may be needed to improve the game."

The following comments were from a Chinese female young adult (21 years old), a university student from Hong Kong.

Pictures: There is a clear starting page and a clean and clear image of male and female characters for players to choose. The colourful checkerboard is eye-catching and therefore, it is able to arouse my interest in playing the game. The artworks match the description of different life situations with clear instructions.

Game Design: The rules were clearly stated. The important rules that describe different points counting system are highlighted in different colors. However, it may be better to specify the use of remaining cash in the game. The use of dice was good in the game as the randomness of the dice resembles the unpredictability of life. The quote in the end can let me reflect about the meaning of life and daily life decisions.

Content: There are four awards in the game which are individual, family, donation and social contribution. This helps me know that there are different values in life. It is good that the cards are written with different kinds of attitudes and feelings. So it can concretize some abstract description. The reasons given when I get a particular card (attitudes and characteristics) can let me know what specific behaviors are classified as certain characteristics. The game also includes different kinds of situation that adolescents and young adults may encounter when they start work. Lastly, the personal financial management table helps me think about how I would spend my money meaningfully. The financial management table can reflect a player's spending pattern and his/her value towards money and success.

Effect: Different situations can impress me and help me think deeper (e.g. work hard so that I can get a card of diligence and bonus of one-month salary; you will get what you deserve; once you work hard, how much effort you make, how much you get)."

Discussion

Our findings suggest potential effectiveness of the electronic learning material. From the feedbacks of the users, the design of the learning material is easy to understand and interesting as it is similar to a popular board game named Monopoly. Most importantly, users agreed that the game helps students acquire money management skills and understand moral values, which is the primary goal of designing the game. The feedbacks are consistent with a previous study that a well-designed and clear instructions digital games is beneficial to adolescents in terms of learning financial literacy, supporting the game-based learning phenomenon in schools (32). The feedbacks have provided some insights to a well-designed DPYD game for young people. For instance, colorful pictures and gorgeous animation attract young people to play the game, increasing their motivation to learn. Moreover, the game has clear learning objectives which are extremely crucial.

Secondly, the effect of teachers' involvement in the process of learning is not ascertained as this is not the focus in this study. However, from the feedbacks of the users, teachers or instructors play an important role in clarifying the learning objectives of the game and indicating a positive effect to enhance the effectiveness of the game. Besides, as pointed out by Kim, Lee (39), teacher support significantly influences youth people who display maladaptive behaviors. Franklin, Kim (40) showcased the effectiveness of school-based psychological intervention delivered by teachers. Teachers not only assist adolescents to learn but also play a therapeutic role which requires further studies to confirm their influence. In addition to their role, teachers can also act as a facilitator to assist in the discussion amongst adolescents on the topic, and getting feedbacks from their fellows. If players receive feedbacks regularly during their learning process, the game is more than just entertainment but a deep learning process for the players (30). To tackle materialism in youth, it is no doubt that educators should be involved.

Thirdly, a previous study has found that Chinese adolescents from different age groups exhibit different level of materialism, which reveals materialism increases with age (41). Impulsive buying behaviors increase with age and female shows more impulsive buying compared to male (42). In response to the gender and age differences, game designers might have to provide a guideline to teachers or instructors to ensure the learning materials are applicable in adolescents with all age range.

Finally, adjustments on the content of the learning materials are suggested. One user shows concerns that the game might be over-emphasizing on money to maintain family relationship while money is just one of the factors that can promote family harmony. Also, some

mini games can be added into the game in order to help players to make correct moral judgements and understand correct moral values.

Limitations

First of all, the feedbacks in this study do not represent the effectiveness of the learning material. The feedbacks are the fundamental ground for further studies. They are purely opinions of the users that cannot be generalized to greater population. This is because qualitative method is not designed to test whether the result is statistically significant or due to chance (43). In fact, the utilization of game-based learning on financial literacy is a relatively new concept that almost no research has been done in Hong Kong. With limited knowledge in this area, it is difficult to make an in-depth conclusion on the effectiveness of the game. Further research on this area is recommended, especially testing the effectiveness of game-based learning on money management using quantitative method with rigorous methodology and validated measurements. In addition, the data in this study is collected only from two individuals. Thus the result in this study should be interpreted with caution.

Apart from that, the game does not cover other protective factors of materialism such as promotion of gratitude (28), social comparison with friends and media influence (12). These factors should not be ignored in the interpretation of the effectiveness of the game. Financial education is one of the possible solutions to tackle the problem of materialism in youth people.

Finally, it is also worth mentioning that the game design itself is limited to money literacy in young people to reflect on materialistic and non-materialistic values. Other factors that contribute to materialism such as parental influence cannot be addressed. Based on the model by Chan and Prendergast (12), social learning from family members on materialistic values contributes to the development of materialism. For those who are strongly influenced by their parents' materialistic value, this learning materialism might not be as effective. Special training on teaching skills is needed to help this group of young people to deal with their conflicting values (35).

Testing the effectiveness

This study did not obtain any quantitative data on the level of materialism of the students. Future studies can conduct a thorough quantitative research to test the effectiveness of the game with regard to minimising materialism among adolescents. Studies have been done in Hong Kong or with Chinese population to explore materialism in adolescents with translated measurements with validation (12, 17, 18). The Chinese Adolescent Materialism Scale (CAMS) is also ideal to be administrated to test young people's level of materialism as it measures materialistic beliefs through several aspects related to materialism which include morality, spirituality, egocentrism and empathy (8). To test the effectiveness of the game, a pre-test and post-test design is recommended. The study could first examine the level of materialism using Richins and Dawson (44) Material Values Scale before introducing the learning material. After students have completed the game, the same set of questionnaires could be done by the same group of students in order to find out if there are changes in their level of materialism by comparing the scores before and after introducing the learning materials. Hieftje, Edelman (45) believed successful electronic media interventions should promote behaviour change. Future studies could also measure behaviour changes of the students who have played the game. From that, the effectiveness of the game could be concluded.

Apart from testing the effectiveness of the game, it is also worth investigating the contribution of teacher's participation. From the feedbacks, teacher seems to play an important role in students' learning process. Therefore, a cross-sectional study comparing the level of materialism between the group of students with teacher's guidance and the group of students without could provide an insight on the effective implementation of the learning materials.

Conclusions

To conclude, the learning materials can educate young people on money literacy. Some adjustments are needed on the game for students to understand the concepts of financial management. Further investigation on the effectiveness of the materials through quantitative method is needed to reach an accurate conclusion on the effectiveness of the game. Overall speaking, the game is a form of "Edutainment" for the promotion of positive youth development among adolescents.

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