

**RESEARCH GRANTS COUNCIL  
COMPETITIVE RESEARCH FUNDING SCHEMES FOR  
THE LOCAL SELF-FINANCING DEGREE SECTOR**

**FACULTY DEVELOPMENT SCHEME (FDS)**

**Completion Report**  
(for completed projects only)

**Submission Deadlines:**

1. Auditor's report with unspent balance, if any: within **six** months of the approved project completion date.
2. Completion report: within **12** months of the approved project completion date.

**Part A: The Project and Investigator(s)**

**1. Project Title**

Promoting Children's Pro-environmental Behavior: A Multilevel Analysis

**2. Investigator(s) and Academic Department(s) / Unit(s) Involved**

Research Team	Name / Post	Unit / Department / Institution
Principal Investigator	Dr NG Mei-lan/ Principal Lecturer	Division of Business and Hospitality Management / School of Professional Education and Executive Development, The Hong Kong Polytechnic University (PolyU SPEED)
Co-Investigator(s)	Dr YIM Pui-yu/ Associate Professor	The Open University of Hong Kong
	Dr LO Man-fung/ Senior Lecturer	Faculty of Education, HKU
Others	N/A	N/A

**3. Project Duration**

	Original	Revised	Date of RGC / Institution Approval (must be quoted)
Project Start Date	01/01/2021	N/A	N/A
Project Completion Date	31/12/2022	N/A	N/A

Duration ( <i>in month</i> )	24 months	N/A	N/A
Deadline for Submission of Completion Report	31/12/2023	N/A	N/A

- 4.4 Please attach photo(s) of acknowledgement of RGC-funded facilities / equipment.  
N/A

## **Part B: The Final Report**

### **5. Project Objectives**

#### 5.1 Objectives as per original application

##### 1. Theory Building

Inspire a novel methodology to examine children's pro-environmental behavior:

❖ Experiment: Using game format experiment and applying the Theory of Planned Behavior (TPB), we will investigate individual children-level's pro-environmental behavior.

❖ Survey: Inviting General Studies teachers who teach the targeted primary school students (i.e. students nested with teachers) to fill the questionnaire about environmental knowledge sharing practices, we will examine the moderating role of teachers' knowledge sharing practices in encouraging children's pro-environmentalism.

❖ Gathering the data from both experiment and survey, we will develop and test a multilevel framework integrating the impact of individual-level and teacher-level factors in explaining pro-environmental behavior of children (Appendix 1).

##### 2. Educational Implications and Government Policy

❖ In-depth Interview: An additional qualitative study will be used to gain insights from primary school principals regarding issues and challenges in implementing environmental education. All the findings in this study will be gathered so as to design educational guidelines in relation to promoting children's pro-environmental behavior. The educational guidelines will also be presented to Hong Kong Aided Primary School Heads Association (香港資助小學校長會).

❖ Inform Teaching: The use of novel methodology will be discussed with students in course subjects, such as Applied Business Research, Marketing Research and Integrated Study.

❖ Government Policy: The findings will inform government related bodies such as Environmental Protection Department (EPD) and Environmental Campaign Committee (ECC) regarding encouraging children's pro-environmental behavior, providing valuable insights into allocation of environmental education resources.

#### 5.2 Revised objectives

Date of approval from the RGC: N/A

Reasons for the change: N/A

### 5.3 Realisation of the objectives

*(Maximum 1 page; please state how and to what extent the project objectives have been achieved; give reasons for under-achievements and outline attempts to overcome problems, if any)*

#### To fulfill objective one: Theory Building

Inspire a novel methodology to examine children's pro-environmental behavior:

❖ Experiment regarding message framing was conducted in secondary schools to investigate students' self-efficacy, perceived values and pro-environmental intention and behavior (Appendix 6). Two papers are published in Business Strategy and the Environment, one paper is submitted in Young Consumers and another paper is submitted to Journal of Interactive Marketing. Also, two conference papers were published in ANZMAC 2021 and ACEID 2022.

❖ Survey was collected from General Studies teachers who teach the targeted primary school students (i.e. students nested with teachers) to fill the questionnaire about environmental knowledge sharing practices, we will examine the moderating role of teachers' knowledge sharing practices in encouraging children's pro-environmentalism (Appendix 7). Also, online questionnaire (Google Form) was collected from the public regarding consumer behavior. One paper with the findings is published in Business Strategy and the Environment and another paper is submitted to Business Strategy and the Environment.

❖ We have submitted a conference paper to ACEID 2023 regarding the multilevel framework integrating the impact of individual-level and teacher-level factors in explaining pro-environmental behavior of children.

#### To fulfill objective 2: Educational Implications and Government Policy

❖ In-depth Interview was done to gain insights from primary school principals regarding issues and challenges in implementing environmental education. All the findings were gathered to design educational guidelines in relation to promoting children's pro-environmental behavior (Appendix 8). The educational guidelines were sent to Hong Kong Aided Primary School Heads Association (香港資助小學校長會), the Association of Heads of Secondary Schools of Tsuen Wan, Kwai Chung & Tsing Yi District, Union of Government School Teachers (UGST), Hong Kong Federation of Education Workers and Hong Kong Prospective Teachers Association.

❖ Inform Teaching was completed. The use of novel methodology and the novel findings were delivered and discussed with students in course subjects, such as Applied Business Research, Integrated Study.

❖ The findings were gathered to send and inform government related bodies such as Environmental Protection Department (EPD) and Environmental Campaign Committee (ECC) regarding encouraging children's pro-environmental behavior, providing valuable insights into allocation of environmental education resources.

### 5.4 Summary of objectives addressed to date

<b>Objectives</b> <i>(as per 5.1/5.2 above)</i>	<b>Addressed</b> <i>(please tick)</i>	<b>Percentage Achieved</b> <i>(please estimate)</i>
1. Theory Building	✓	100%
2. Educational Implications and Government Policy	✓	100%

## 6. Research Outcome

### 6.1 Major findings and research outcome

(Maximum 1 page; please make reference to Part C where necessary)

In the published paper titled *Why do young people do things for the environment? The effect of perceived values on pro-environmental behavior* revealed that the perceived values of children regarding environmentalism play an essential role in developing pro-environmental attitudes and behavioural intentions, such as recycling intention and conservation intention (Appendix D). The results support the utility of TPB for its adoption of attitude and behavioural intention as key components of the model. The use of CVT showed that three dimensions of young people's perceived values, namely, emotional value, functional value and relational value, predict a pro-environmental attitude, while attitude predicts recycling intention and conservation intention.

In the publish paper titled *Green consumption and sustainable development: The effects of perceived values and motivation types on green purchase intention* integrating customer value theory (CVT) and self-determination theory (SDT) to explain green purchase behavioral intention (Appendix E). Three hundred and five participants were recruited, and the findings were analyzed using partial least square structural equation modelling (PLS-SEM). Results suggested that the three perceived values (i.e., emotional value, functional value, and relational value) significantly predict perceived green product value, while perceived green product value predicts four types of regulations (i.e., external regulation, introjected regulation, identified regulation, and integrated regulation). Results also showed that autonomous motivation (i.e., identified regulation and integrated regulation) significantly predicts green purchase intention. These findings provide theoretical implications to SDT and customer value theory in the field of green business strategy management and practical implications to green businesses and governments.

In the submitted paper titled *Green Marketing 4.0: The impact of green interaction on green purchase intention* examined the underlying mechanism of green interaction and specific perceived values on green purchase intention. A total of 308 participants were recruited to complete a survey regarding green purchases in China. Structural equation modeling (SEM) was used, and the findings provided empirical evidence that emotional value is a central concept that mediates the relationship between green interaction (i.e. social media and online peers) and other value dimensions (Appendix F). The study provides significant findings for organizations and marketers to implement more effective marketing strategies to promote green products.

In the submitted paper titled *Near or far? Gain or loss? The Trigger of Messages Framing on Young Consumers' Pro-environmental Behaviors* revealed through three experiments the conditions under which young people are more (or less) likely to report self-efficacy and functional, emotional, and relational values. In study 1 and 2, the results indicated that the effect of triggering self-efficacy, emotional value, and relational value was significant when green messages were framed with the matched loss and concrete condition (Appendix C). Replicating the results of previous studies, study 3 found that social media exposure with loss and concrete message triggers emotional and functional values and green consumption intention. The results have important managerial implications for policymakers, advertisers, and conservationists who seek to promote green consumption among young people by using framed messages with matched conditions.

In the conference paper titled *Enhancing green purchase intention: Perspectives of perceived values and self-determination theory* aims to investigate how consumers' perceived values influence different motivation types, and in turn affect their green purchase behavioral intention. An extended research model by integrating customer value theory (CVT) and self-determination theory (SDT) is developed to explain green purchase behavioral intention (Appendix 2). 305 participants were recruited and the findings were analyzed using partial least square structural equation modelling (PLS-SEM). Results suggested that the three perceived values (i.e. emotional value, functional value, and relational value) significantly predict perceived green product value,

while perceived green product value predicts four types of regulations (i.e. external regulation, introjected regulation, identified regulation and integrated regulation). Results also showed that autonomous motivation (i.e. identified regulation and integrated regulation) significantly predicts green purchase intention. These findings provide theoretical implications to self-determination theory and customer value theory in the field of green business strategy management and practical implications to green businesses and governments.

In the conference paper titled *The Mediating Role of Primary School Environmental Education in Promoting Children's Pro-environmental Behavior; A Game Format Experiment* revealed that environmental education in primary school is necessary to act as a mediator between pro-environmental attitude to pro-environmental intention and further induce PEB.

## 6.2 Potential for further development of the research and the proposed course of action (Maximum half a page)

The results of all the studies have important managerial implications for policymakers, educators, and conservationists who seek to promote nature conservation among young people by using framed messages with matched conditions. Beyond the education sector, we suggest that teachers create novel green communication messages, promotional videos, and activities at schools to enhance nature conservation in young people. Conservationists and policymakers in Hong Kong should ensure that their policies and promotional strategies account for this factor to inspire young people to modify or change their intentions and behaviors. Although many resources have been deployed by government bodies to promote nature conservation, the effect is not salient. The environmental messages are delivered to young people, yet they may see themselves as incapable of performing nature conservation behaviors. Conservationists and policymakers should consider delivering appropriate messages and promotional videos to young people when promoting green products and services. To promote nature conservation, the government could design an animal theme park (i.e. Ocean Park Hong Kong) using effective message framing strategies to enhance young people's self-efficacy and emotional and relational values. Conservationists and policymakers of the animal theme park could develop promotional messages, games, rides, and educational talks using loss-framed and concrete messages and videos to induce self-efficacy and perceived values.

## 7. Layman's Summary

*(Describe in layman's language the nature, significance and value of the research project, in no more than 200 words)*

Children's pro-environmental behavior is crucial to achieve a more sustainable future. Increasing attention has been paid to identify what factors are vital to children's pro-environmental behavior. This project found that environmental education could not only trigger pro-environmental intention of students but encourage their behavior. In environmental education, message framings are important when delivering environmental messages to students to trigger their pro-environmental intention and behavior. Especially, loss and concrete messages could generate self-efficacy, emotional and relational value. With the message framings, this project also found that students with higher environmental knowledge from outside school generate higher pro-environmental behavior. Practical implications are provided to schools and the government to utilize message framing.

This project also investigated the green consumer behavior. This project examined that with the support of socialization agents, consumers' perceived values can be generated and encourage green purchase attitude and intention. Moreover, consumers' perceived values (functional, relational and emotional values) could generate economic value and further predict autonomous motivation and green purchase intention of consumers. These findings pose the importance of perceived values and motivation of consumers. Practical implications are provided to green businesses and the government to generate consumers' perceived values, motivation and intention to purchase green products.

## Part C: Research Output

### 8. Peer-Reviewed Journal Publication(s) Arising Directly From This Research Project

(Please attach a copy of the publication and/or the letter of acceptance if not yet submitted in the previous progress report(s). All listed publications must acknowledge RGC's funding support by quoting the specific grant reference.)

The Latest Status of Publications				Author(s) (denote the corresponding author with an asterisk*)	Title and Journal / Book (with the volume, pages and other necessary publishing details specified)	Submitted to RGC (indicate the year ending of the relevant progress report)	Attached to this Report (Yes or No)	Acknowledged the Support of RGC (Yes or No)	Accessible from the Institutional Repository (Yes or No)
Year of Publication	Year of Acceptance (For paper accepted but not yet published)	Under Review	Under Preparation (optional)						
2023	2023	N/A	N/A	Dr. Peggy M. L. Ng*, Miss Cherry T. Y. Cheung, Mr Lit Kam Kong, Dr Calvin Wan, Dr Choy T.K. Ellesmere	Ng, M. L., Cheung, T. Y. Cherry., Lit, K. K., Calvin Wan., & Choy, T.K. Ellesmere. (2023) Green consumption and sustainable development: The effects of perceived values and motivation types on green purchase intention. <i>Business Strategy and the Environment</i> .	N/A	Yes [Appendix E]	Yes	N/A
2022	2022	N/A	N/A	Dr. Peggy M. L. Ng*, Miss Cherry T. Y. Cheung	Ng, P. M. L., & Cheung, C. T. Y. (2022). Why do young people do things for the environment? The effect of perceived values on pro-environmental behaviour. <i>Young Consumers</i> , 23(4), 39-554. <a href="https://doi.org/10.1108/YC-11-2021-1411">https://doi.org/10.1108/YC-11-2021-1411</a>	N/A	Yes [Appendix D]	Yes	N/A

The Latest Status of Publications					Title and Journal / Book (with the volume, pages and other necessary publishing details specified)	Submitted to RGC (indicate the year ending of the relevant progress report)	Attached to this Report (Yes or No)	Acknowledged the Support of RGC (Yes or No)	Accessible from the Institutional Repository (Yes or No)
Year of Publication	Year of Acceptance (For paper accepted but not yet published)	Under Review	Under Preparation (optional)						
N/A (under review)	N/A	Yes	N/A	Dr. Peggy M. L. Ng*, Miss Cherry T. Y. Cheung, Mr Kam Kong Lit, Dr. Man Fung Lo, Dr. Calvin Wan	Ng, M. L. Peggy, Cheung T. Y. Cherry, Lit Kam Kong, Lo, M. F. & Calvin Wan (Submitted). Near or far? Gain or loss? The triggers of young consumers' self-efficacy and perceived value in pro-environmental behaviors. <i>Journal of Interactive Marketing</i> .	N/A	Yes [Appendix C]	Yes	N/A
N/A (under review)	N/A	Yes	N/A	Dr Peggy M. L. Ng*, Mr Kam Kong Lit, Miss Cherry T. Y. Cheung, Dr LAU, Mei-mei May, Dr Ellesmere T. K. Choy	Peggy M. L. Ng., Kam Kong Lit., Cherry T. Y. Cheung., Mei-mei Lau., Ellesmere T. K. Choy (with editor). Green Marketing 4.0: The impact of green interaction on green purchase intention. <i>Journal of Interactive Marketing</i>	N/A	Yes [Appendix F]	Yes	N/A

**9. Recognized International Conference(s) In Which Paper(s) Related To This Research Project Was / Were Delivered**

*(Please attach a copy of each conference abstract)*

<b>Month / Year / Place</b>	<b>Title</b>	<b>Conference Name</b>	<b>Submitted to RGC</b> <i>(indicate the year ending of the relevant progress report)</i>	<b>Attached to this Report</b> <i>(Yes or No)</i>	<b>Acknowledged the Support of RGC</b> <i>(Yes or No)</i>	<b>Accessible from the Institutional Repository</b> <i>(Yes or No)</i>
12/2021/ Melbourne/ Australia (Attending online)	Environmental message framing effects and the role of environmental knowledge in students' pro-environmental behavior	ANZMAC 2021	N/A	Yes [Appendix A and Appendix 9]	Yes	N/A
03/2022/ Japan (Attending online)	The Mediating role of primary school environmental education in promoting children's pro-environmental behavior	ACEID2022	N/A	Yes [Appendix B and Appendix 10]	Yes	N/A
03/2023/ Japan	A Multilevel Framework on fostering children's pro-environmental behavior	ACEID2023	N/A	Yes [Appendix 11]	Yes	N/A

**10. Whether Research Experience And New Knowledge Has Been Transferred / Has Contributed To Teaching And Learning**

*(Please elaborate)*

Educational guideline (Appendix 12) in PowerPoint has been sent to the Hong Kong Aided Primary School Heads Association, the Association of Heads of Secondary Schools of Tsuen Wan, Kwai Chung & Tsing Yi District, Union of Government School Teachers (UGST), Hong Kong Federation of Education Workers and Hong Kong Prospective Teachers Association to share the results of our studies and the practical implications in environmental education.

**11. Student(s) Trained**

*(Please attach a copy of the title page of the thesis)*

<b>Name</b>	<b>Degree Registered for</b>	<b>Date of Registration</b>	<b>Date of Thesis Submission / Graduation</b>
N/A	N/A	N/A	N/A



## 12. Other Impact

*(e.g. award of patents or prizes, collaboration with other research institutions, technology transfer, teaching enhancement, etc.)*

The new knowledge (a match of loss (gain) frames with concrete (abstract) mind-sets

leads to self-efficacy, emotional and relational values by applying prospect theory and

construal level theory leads to pro-environmental intention), the novel research design

(i.e. experiment in pro-environmental message framing) and the novel methodology

(i.e. 2 x 2 ANCOVA) was delivered to “BHMS4418 Applied Business Research”

and “BHMS4419 Integrated Study”.

## 13. Statistics on Research Outputs

	Peer-reviewed Journal Publications	Conference Papers	Scholarly Books, Monographs and Chapters	Patents Awarded	Other Research Outputs (please specify)	
No. of outputs arising directly from this research project	4 (2 published and 2 under review)	2			Type	No.

## 14. Public Access Of Completion Report

*(Please specify the information, if any, that cannot be provided for public access and give the reasons.)*

Information that Cannot Be Provided for Public Access	Reasons
N/A	N/A