# RAE2020 Lamb Lamp

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ARTICIPACIÓN O

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## Title: Counseling Service Through Family Functioning and Gamification Enhanced Design

## Descriptor

The research attempts to examine the multidisciplinary approach about incorporating **interactive prototype and gamification with tangible experience** (design discipline) and **family functioning** (social sciences discipline) to address the emerging global societal issue- **mobile addiction** in Hong Kong and overseas (Shek and Yu, 2016; Beranuy, Oberst, Carbonell and Chamarro, 2009) which causes **negative impact to family relationship** (Takao, Takahashi & Kitamura, 2009; as cited in Chóliz, 2012) during 2016-2018.

The project also demonstrates a cross-disciplinary platform whereby innovative methods are explored for the advancement of social work's practice. The team members include Dr. Kenny Chow (Interaction Design Lab), Mr. Benny Leong and Dr. Brian Lee (Design Led) (Asian Lifestyle Design Lab) from School of Design, The Hong Kong Polytechnic University, and Dr. Elda Chan (mental health and addiction counsellor of Integrated Centre on Addiction Prevention and Treatment (ICAPT) of Tung Wah Group Of Hospitals) who provides 'family-based' counselling service. The proposed familyfocused intervention system (an interactive lamp with wireless mobile charging platform, a series of game design, game log, selfguided probe, home visit and interviews) is based on family functioning (Dai and Wang, 2015; Epstein, Bishop and Levin, 1978; Shek,, 2002; Smilkstein, 1984) and gamification theory (Deterding et al., 2011; Caillois, 2001) to enhance intimate parent-adolescent interactivity and mitigate adolescents' excessive mobile use through specifically designed tangible games (activated by charging /put down the mobile).

The result was presented at two conferences (one with best presentation award), in the International Journal of Mental Health and Addiction, and exhibited at three local and international design exhibitions. The system received one product design award and one social service innovation award. The project team received **additional funding** (around HK\$800,000) to further extend the study in which **ninety families** will be invited to further test the modified prototype during the end of 2018 to end of 2020.

## Short Bio of Brian LEE

Brian Lee, a designer and researcher, who explores social value change through prototyping approach and stakeholder's empowerment. His research questions the roles of tangible artifacts and systems in the perspective of sociomateriality in design, quality of life, creative citizenship, and sustainable living.

#### What constitutes the body of work

## (I) Awards

Ten sets of working prototype are made. It includes an interactive lamp (in a metaphor of a lamb) with wireless mobile charging function and a set of games facilitated by the interaction with the lamp (controlled by sensors with LED interface). Two awards are received and recognized by two different fieldsone by design discipline and one by social work. They are:

- Bronze A' Design Award at Lighting Design Award Category, A' Design Award & Competition, Italy (15 Apr 2018)
- Outstanding Award, Wofoo Asian Award for Advancing Family Wellbeing 2018, Consortium of Institutes on Family in the Asian Region (CIFA) (21 Aug 2018)



by Brian Lee and Benny Leong

## A'DESIGN AWARD & COMPETITION

Certificate of Excellence

This is to certify that

Brian Lee, Benny Leong & Ida Chan

has won the Bronze A' Design Hward in Lighting Products and Lighting Projects Design Category in 2017 - 2018 period with design #64928: Lamb - Interactive playful lamp

About The Bronze A' Design Award Bronze A' Design Award is a prestigious award %10 percentile designs that has achie ed grand jury panel of press membr als, academics & entrep e ranked based on standard deviation of jury voter see & unterlion distinct as I design worldwide, the ultimate aim of the acco ers, brands & companies to

15 April 2018, Milan / Italy

## What constitutes the body of work

## (II) Research publications

The team publishes one journal paper (peer reviewed), two conference papers (peer reviewed). One in design field. One in social science field.

- Leong, B. D., Lee, B. Y. H., & Chow, K. K. N. (2018). Collective Play Versus Excessive Use: an Insight into Family-Focused Design Intervention for Mobile Phone Overuse. International Journal of Mental Health and Addiction, 1-16. (DOI: <u>https://doi.org/10.1007/s11469-018-9966-9</u>)
- LEONG Benny, LEE Brian, CHOW Kenny. (2017). A Multidisciplinary Initiative of Intervening Mobile Addiction via Family-focused and Gamification-enhanced Design, Asia - Design Engineering Workshop (A-DEWS), Seoul National University, Dec 11-12, 2017 (best presentation award)
- CHOW Kenny, LEONG Benny, LEE Brian. (2017). **Designing intervention with technology for healthy mobile use Personal and home approach.** The First Asia Pacific Conference of Addiction Professionals (APCAP), HK, May 18-19, 2017

## What constitutes the body of work

## (III) Design exhibitions

The design project "Lamb Lamp" was invited to showcase in a professional product design exhibition in Hong Kong.

- A' Winners' Exhibition at "MOOD" Ex Chiesa di San Francesco, Como, Italy. (10 Jun 7 Jul 2018)
- A' Winners' Exhibition at "Shenzhen International Industrial Design Fair", Shenzhen, China. (5-7 Nov 2018) and "Hebei Design Week" Exhibition, Hebei, China (18-24 Oct 2018)
- Industrial Designers Society of Hong Kong 15th Anniversary Exhibition, Hong Kong Polytechnic University (23-30 Sep 2018)

#### **Research questions**

- 1. How technology-enabled interactive design platform can facilitate family fun time and enable rebuilding family relationship (e.g. mutual understanding and trust) that subsequently increases quality family interaction instead of screen time of individuals?
- 2. Would and how adolescence and or family members enjoy the physical prototype with playful elements (based on the theory of family functioning) even though they are highly engaging with other virtual and visual intensive online and computer games?
- 3. How design prototype approach can play a supportive role for the counsellors to carry out their current counselling service on parents-adolescent relationship?

## Research field and key works referenced

- Research through design intervention
- Family functioning enhanced through gamification
- Parent-adolescent relationship

С

Mobile phone overuse



Two types of interactive design interventions were implemented into the research process- (i) the **interactive lamp** with **wireless mobile charging** feature and the function to **recommend different games** when the users activates it (at least two members charging the phones at the same time) through **hand gesture** on top of the lamp shade, and (ii) the **lifestyle probing tool** that providing a more engaging experience while filling the personal information as well as carrying out the self evaluation and other types of assessment.

The interactive lamp and the game cards were developed according to the assumption of **McMaster model** and the enhancement of **family functioning** will bring **positive family relationship and initiate communication channel** to **support the counsellor's intervention** to solve the intergenerational issues. Referring to the suggested **six dimensions of the model**-communication, roles, problem solving, behavior control, affective involvement, and affective responsiveness, it is adopted into the situated intervention with the facilitation by the prototype and game design.

In the **pilot study (Phase I)**, **eight convenient samples** of families recruited through ICAPT were invited to go through the **pre- and post-evaluation** before and after the installation of and interaction with the 'Lamb' for one month at home . Having positive results from both the parents, children and the social workers, the project team received additional funding to further extend the study. In **second phase** of the research, the engagement aims to extend to **ninety families** in which **thirty** of them (half with family issues, and half are control group) will be involved in a longer term implementation at their home (two to three months). All thirty home's installations and data are expected to be finished and collected at middle of 2020.

At phase I, the team carried out qualitative case studies of ten families from the convenience samples provided by ICAPT (two samples are incomplete due to drop out). Families with children encountering mobile addiction within twelve to nineteen were invited to participate the design intervention exercise with the installation of the 'Lamb Lamp', and to play the games with family members and fill in the lifestyle probes within around six to eight weeks. Pre- and post-evaluation thought the probes and semi-structured interview were conducted to collect insights.

#### Phase I: Develop prototype, research tools, and conduct user test

**Step I- Problems identification** through experts interview, literature review, and idea development with design team and social worker's team.

**Step II- First full functional prototype evaluation** with expert's comments (engineers from Industrial Centre, HKPolyU; psychologist and social workers from ICAPT)

Step III- Final prototype and probing tools production (iterative process looping amongst step I, II & III)

**Step IV- Design intervention and data collection** (engaging the potential families including installing the lamp at home, interviewing the family members, and the social workers)

Step V- Data analysis, reflection and dissemination

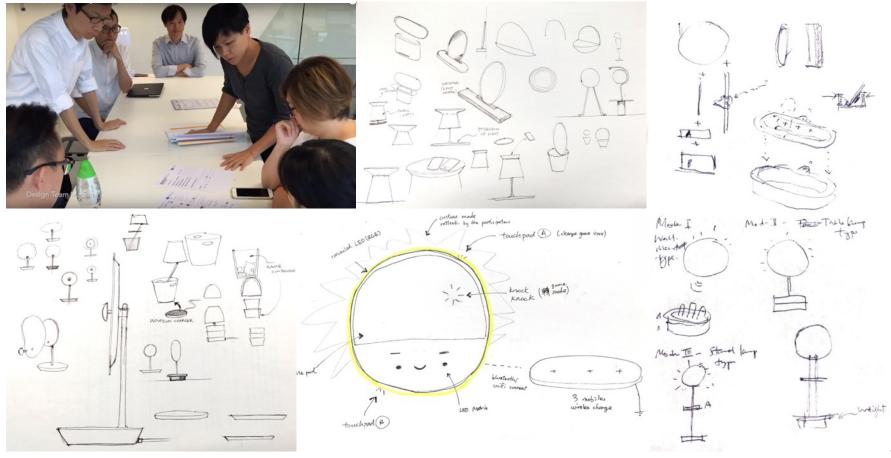
Step VI- Modification of prototype and game play for phase II

Phase II- Development of 2<sup>nd</sup> prototype and participatory design workshop for ninety families (On going from end of 2018 to 2020)

#### \*Selected records

Step I- Problems identification through experts interview, literature review, and idea development with design team and social worker's team.

\*Below are the selected images/ sketches about the early project meeting and design problems/ concepts articulation through visualisation.



#### \*Selected records

Step I- Problems identification through experts interview, literature review, and idea development with design team and social worker's team.

\*Table: The **interactive game's prototype** is framed according to a set of game design elements from Deterding et al. (2011) and Caillois (2001) to intervene and assess the improvement of **'family functioning'** performance (Chen et al. 2015; Dai & Wang, 2015) of the participants of the family.

Interactive game prototype's elements	Purpose	Example
Interface	Providing engaging design components to retain family members' interest and divert their attention from mobile devices.	Mobile device docking platform, visual/audio signals, physical props, performance index.
Affective stimuli	Specific gaming conditions or stimuli designed to trigger parents' and adolescents' affective responses and interaction.	Timed eye/bodily contact, intellectual/physical interdependence.
Mechanics	Reoccurring parts of game design that elicit the affective responses of parents and adolescents.	Time constraints, punishments/rewards.
Type/model	Types or conceptual models of games selected to ensure all members' affective involvement.	Chance, challenge, competition, dynamism, simulation.

Reference:

Caillois, R. (2001). Man, play and games (Meyer Barash, Trans.). Urbana and Chicago, IL: University of Illinois Press. (Original work published 1958) Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011, September). From game design elements to gamefulness: Defining gamification.

Proceedings of the 15th International Academic MindTrek Conference: Envisioning future media environments (pp. 9–15). New York, NY: ACM.

Chen, Y. L., Chen, S. H., & Gau, S. S. F. (2015). ADHD and autistic traits, family function, parenting style, and social adjustment for Internet addiction among children and adolescents in Taiwan: A longitudinal study. Research in Developmental Disabilities, 39, 20–31.

Dai, L. T., & Wang, L. N. (2015). Review of family functioning. Open Journal of Social Sciences, 3, 134–141.

#### \*Selected records

**Step II- First full functional prototype evaluation:** The project team evaluated the prototypes with the experts (engineers from Industrial Centre, HKPolyU; psychologist and social workers from ICAPT)



A. The multi-disciplinary team's meetings on the testing interactiveness of the electronic engineering issues (hardware driven).

B. The design team and the psychologist from ICAPT were evaluating the interactive-ness of the game (software focus).

#### \*Selected records

**Step Illa- Final prototype production:** In order to enhance the user experience and to simplify the production, **i**terative process was carried out to refine the functions and form language of the prototype.



A. Further exploration of different product features and interface to induce more effective user's experience.



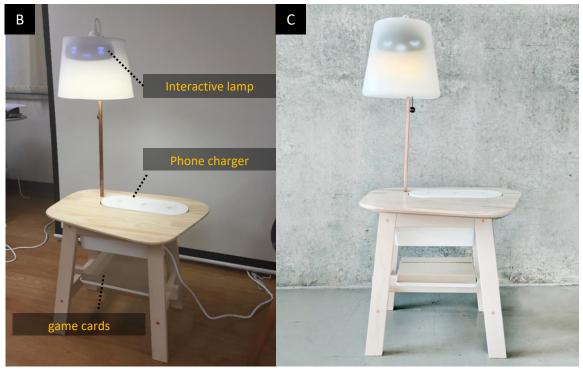
B. All the components of the final prototype of phase I of the project was recorded to enable the planning of batch production and assembly.

#### \*Selected records

**Step Illa- Final prototype production**: It is expected that the household users may perceive the iconic image of 'lamb' while the interactive lamp is placed at their home. The team aimed to develop the lamp which can immersed into the home environment and enhanced the lifestyle quality with a cozy home atmosphere.



A. The symbolic meaning 'Lamb' is applied to enhance the quality of interaction with the users (family members).

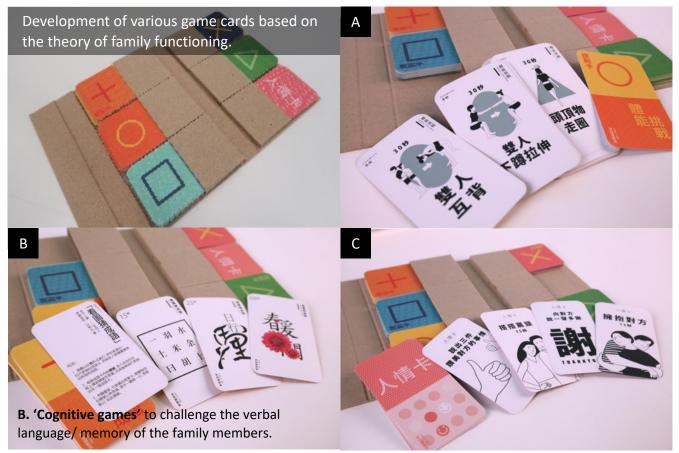


B. Full function prototype Ver 1.0

C. Full function prototype Ver 2.0

#### \*Selected records

**Step IIIb- Final game cards production**: Total five different game plays were incorporated to enable intergenerational playful experience. It includes physical challenge, cognitive game, action imitation and guess, coordination challenge, and empathy game.

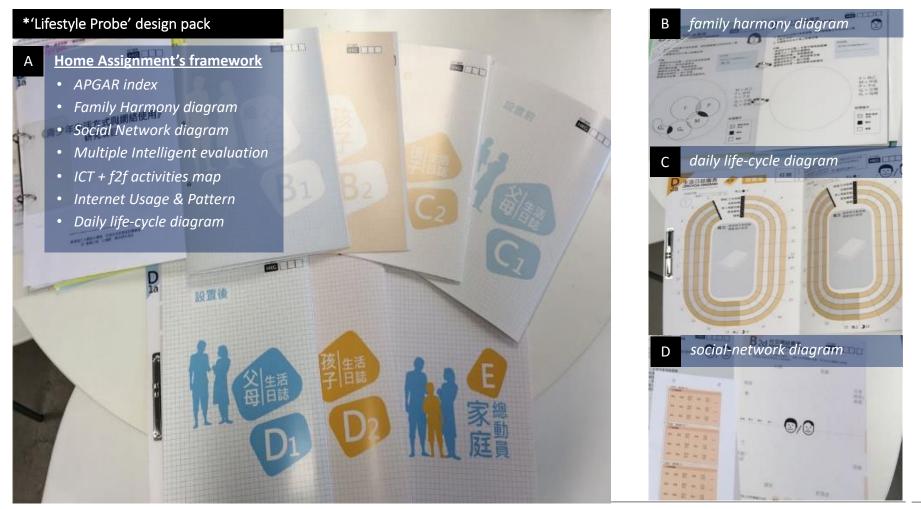


**A. 'Physical games'** to promote bodily coordination/ with physical touch to enhance intimacy. It can be carried out either by individual or pair up with family member.

**C. 'Appreciation actions'** to promote care/ love to other family members through intimate interaction, appreciation, thank you or recognition to each other.

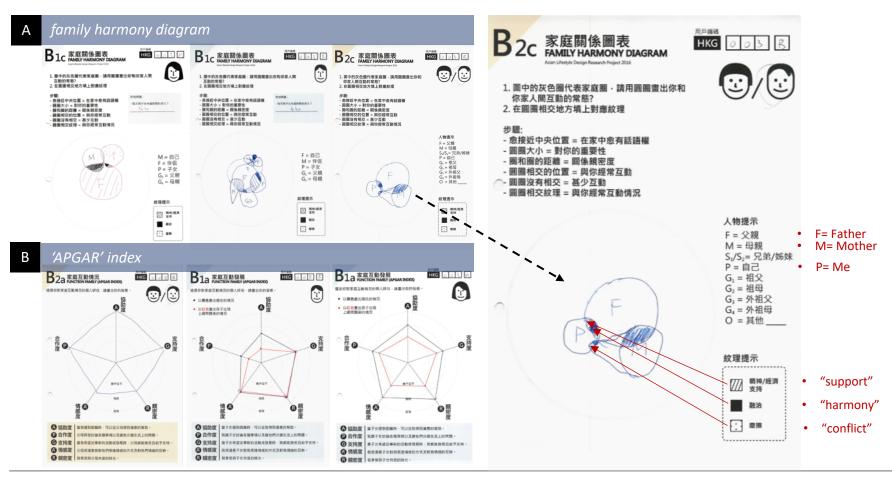
#### \*Selected records

**Step IIIc- Final probing tools production:** Pre & post probing were conducted before and after the family members engaged the lamp at home.



#### \*Selected records

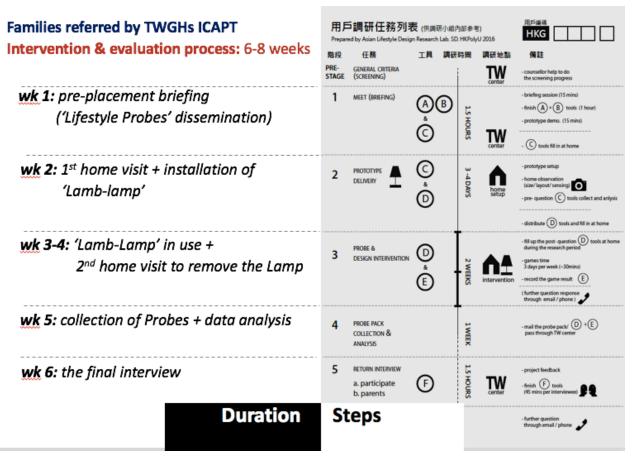
**Step IIIc- Final probing tools production:** Each family member was invited to fill in the probe and conduct self evaluation and perceptions on some concepts related to family functioning.



#### \*Selected records

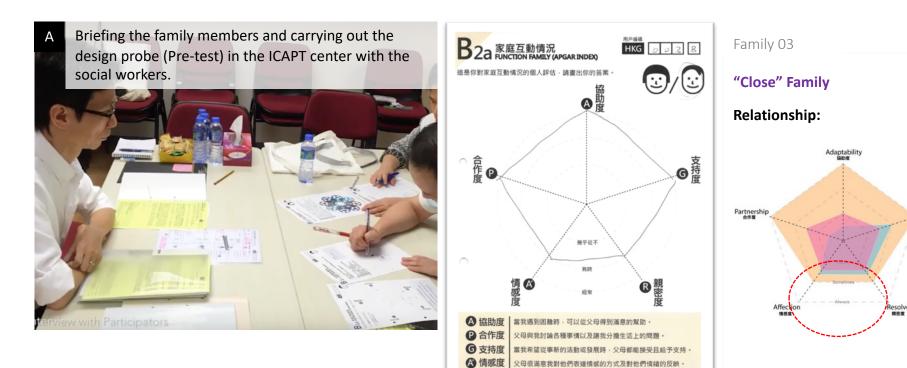
#### Step IV- Design intervention and data collection

#### A The protocol of the research



#### \*Selected records

#### Step IV- Design intervention and data collection



**R**親密度

我享受與父母共度的時光

#### Communication Frequency/ Intensity:



Father

Growth

#### \*Selected records

#### Step IV- Design intervention and data collection



#### \*Selected records

#### Step V- Data analysis and reflection

- А
- \*Example Case 03

#### "Close" Family

General Information - No. of Member: Five ( parents + one son +

two maids) - Family Income(year):

> \$300,000

- Dwelling type & Location: Semidetached housing, Kowloon City "I feel that our hierarchy becomes equal when I really played with my son." "I have quite good experience with the game platform. It supports the nurture of family's bonding gradually." "Aptitude of my son changes better. I had better interaction with him."

Family member 1: **Father** Age: 56 Occupation: Director of trading Education: Master or above Family member 2: **Mother** Age: 52 Occupation: Retired Teacher/ Housewife Education: Bachelor Degree



"I realized my son is still 'here', and

he interacts more gentle/ kind with

his mother." "I realized my son is still 'here', and

he interacts more gentle/kind with

his mother."

"My son seems enjoying the interaction with us." "We all laugh intensively." "We have more interaction...in particular me."



3

"There is a small improvement such as more coordination and mutual agreement are happened" "We tried to appreciate other's perspective." "I expect to discuss with my family about my personal interest..."

Family member 3: Son Age: 19 (Male) Occupation: employee under his father Education: drop-out from High School

#### **Research conclusions**

In order to enable the functioning, the **analogy of a 'lamb'** with friendly and engaging animal-like character and the tetrapod structure with an illuminated head and facial expression provided by animated blinking eyes and mouth are integrated to induce different user experience and concepts such as the modes the game (inactivated and activated), types of game (different geometrical forms), and emotion of the lamb (joy, sleepy, contempt etc.). The family members may take different card games according to the random suggestion by the 'lamb' and **playful challenges** (intellectual, physical, bodily-interactive, and collaborative game) are provided. We identify that **majority of the participants received constructive self-reflection** such as discovering another capabilities or characteristics of their family members.

The intervention strategy through the tangible play platform "Lamb Lamp" with the incentive of putting down the mobile phones together verifies the assumption that collective play activities can impact positively on parent-adolescent relationships, in return enhancing the psychosocial role of family in mitigating adolescents' likelihood of addiction development.

With data collected and evaluated with various families, initial results show positive benefits that **tangible collective-play** not only stimulated **emotional connectivity** between parents and adolescents, but also encouraged them to **relive joyful memories** of family activities before the mobile overuse problem had arisen.

This project was initiated by the departmental research grant HK\$300,000 (around US\$38,000) from School of Design, The Hong Kong Polytechnic University) since middle of 2016. The pilot study received second batch of funding (around HK\$860,000/ US\$109,000) from the Jockey Club Charity Trust (One of the major funder in HK promoting social innovation projects) and Tung Wah Group Hospitals from Oct 2017 to Oct 2020.

## **Dissemination and distribution of outcomes**

Awards & publications (2 awards, 1 peer reviewed journal, 2 peer reviewed conference papers)

Year	Categories	
	<u>Awards</u>	
2018	Lee Brian, Leong Benny, Kenny Chow & Chan Ada (2018). <b>Bronze A' Design Award</b> at Lighting Design Award Category, A' Design Award & Competition, Italy	
2018	Chan Elda, Leong Benny, Lee Brian & Chow Kenny (2018). <b>Outstanding Award</b> , <b>Wofoo Asian Award for Advancing</b> Family Well-being 2018, Consortium of Institutes on Family in the Asian Region (CIFA)	
	Journal paper (peer reviewed)	
2018	Leong, B. D., Lee, B. Y. H., & Chow, K. K. N. (2018). Collective Play Versus Excessive Use: an Insight into Family- Focused Design Intervention for Mobile Phone Overuse. International Journal of Mental Health and Addiction, 1-16. (DOI: <u>https://doi.org/10.1007/s11469-018-9966-9</u> ) (source: <u>http://ira.lib.polyu.edu.hk/handle/10397/81446</u> )	
	<u>Conference paper (peer reviewed)</u>	
2017	LEONG Benny, LEE Brian, CHOW Kenny. (2017). <b>A Multidisciplinary Initiative of Intervening Mobile Addiction via</b> <b>Family-focused and Gamification-enhanced Design</b> , Asia - Design Engineering Workshop (A-DEWS), Seoul National University, Dec 11-12, 2017 ( <b>best presentation award</b> ) (source: <u>http://ira.lib.polyu.edu.hk/handle/10397/81438)</u>	
2017	CHOW Kenny, LEONG Benny, LEE Brian. (2017). <b>Designing intervention with technology for healthy mobile use -</b> <b>Personal and home approach</b> . The First Asia Pacific Conference of Addiction Professionals (APCAP), HK, May 18-19, 2017	

## **Dissemination and distribution of outcomes**

Exhibitions

Year	Categories	
	Exhibitions	
2018	Lee Brian, Benny Leong & Kenny Chow (2018). <b>Lamb Lamp</b> , A' Winners' Exhibition at "Shenzhen International Industrial Design Fair" Shenzhen, China. (5-7 November 2018)	
2018	Lee Brian, Benny Leong & Kenny Chow (2018). <b>Lamb Lamp</b> , A' Winners' Exhibition at "MOOD" Ex Chiesa di San Francesco, Como, Italy. (10 June - 7 July 2018)	
2018	Lee Brian & Benny Leong. (2018). <b>Lamb Lamp</b> , Industrial Designers Society of Hong Kong 15th Anniversary Exhibition, Hong Kong Polytechnic University in 23-30 Sep 2018	

## References

#### <u>Websites</u>

- 1) <u>http://www.sd.polyu.edu.hk/en/research/design-legacy-aldl-project</u>
- 2) <u>https://www.polyu.edu.hk/cpa/excel/en/201808/viewpoint/v1/index.html</u>

#### Press interview

See appendix

#### <u>Remarks</u>

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