SINGAPORE-CAMBRIDGE GENERAL CERTIFICATE OF EDUCATION (H1) EXAMINATION

PROJECT WORK

Cover Page for Written Report

School: Group Index No.:

Title of Project: Project Task (please circle): **1 / 2**

Word Count:

Declaration: We declare that this Written Report is our own work and does not contain plagiarised material.		
NAME	**CENTRE / INDEX NUMBER**	**SIGNATURE**

Candidates' information is verified by:

Name of Supervising Tutor: .....

Signature: ..... Date: .....

Candidates are to fill in the details, sign and attach one completed Cover Page to the Written Report.

AC 011

girls dyna**mite**

Girls Making ICT a Lifestyle

ANGLO-CHINESE JUNIOR COLLEGE

PROJECT WORK 2016

ABSTRACT

Our project aims to reach out to female students in Singapore in order to expand Information and Communications Technologies (ICT) education among them. According to our findings, female students are not adequately informed about the ICT and perks of studying it. This results in female students becoming disinterested in ICT. Hence, we resolve that ICT has to be made more appealing to be better accepted and understood for female students. The appeals are considered based on their preferences that are indicated in the surveys we have conducted.

Hence, driven by this issue, we come up with three different strategies: ICT Competition, online-based ICT game as well as social media pages to promote ICT. These programmes aim to bring ICT closer to the lives of female students to increase their encounter by ICT. By doing so, it is hoped that the ICT education among female students at secondary school level in Singapore can be expanded.

TABLE OF CONTENTS

EDITORS NOTE

The cover page depicts a series of codes that are used to programme a computer, a very key aspect to ICT. We also foreground the theme through incorporating HTML codes ie. <bold>, </bold> into the title. The emboldening of the text symbolises our hope to cultivate boldness among female students to venture into ICT. Lastly, purple and pink are used in this report as these colours are closely associated to female.

<title> introduction </title>

A. CURRENT AND FUTURE NEEDS

Singapore aspires to be a Smart Nation to remain competitive (Lee, 2014). This entails the need to bolster the ICT industry in Singapore, as the initiative redirects Singapore to be focused in "multi-billion annual research and development (R&D) investments, a fast-growing community of tech start-ups", according to the website.

Consequently, this bring a greater demand for professionals with ICT proficiency in Singapore.

- According to a report by Straits Times → 30,000 job vacancies in the IT industry which remain unfilled by 2017
    - Local graduates are not enough to fulfil the demand by local manpower market (Tan, 2016)
- Globally, the demand for ICT related job has also been steadily increasing since the beginning of the millennium (ITU, 2012)

B. PROBLEM

Despite the condition of shortage and promising future of ICT, women are far behind their male counterparts in terms of their engagement in the industry.

- In Singapore, women only make up 29,57% of the STEM industry (Phaidon International, 2014)
- Even in the world's wealthiest continent, Europe, it has been predicted that there will be a skills gap of over a half million ICT jobs in Europe (Mid-Pacific ICT Centre, 2016)

Hence, the root of the problem starts earlier on, in both the society and education system female students are at.

- Entrenched gender stereotype → men are seen to be more well-suited for the job as they occupy most high-value and high-income jobs in the sector (ITU, 2012)

- Gender imbalance in Singapore ICT education → disproportionate number of women who major in ICT (NUS, 2015)
    - Without sufficient educational background, it is more unlikely for females to be professionals in ICT sector (Nesta, 2014)
- Negative impression of ICT among female students → "beyond comprehension", "too technical" to describe ICT (Annex A)
- Current strategies fails to attract more females into the industry → reinforces the notion of ICT being a "masculine domain" (Milizewska, 2010)

C. CURRENT EFFORTS

The Ministry of Education has created "Computer Studies" as an O-Level subject. It introduces the basics of computing to students at secondary school level, and taken as an elective subject.

The current strategy has not been effective to elicit their passion in ICT. Nearly half of the respondents, female students in secondary school level who has undergone Computer Studies curriculum for over a year, find that the learning process is not enjoyable.

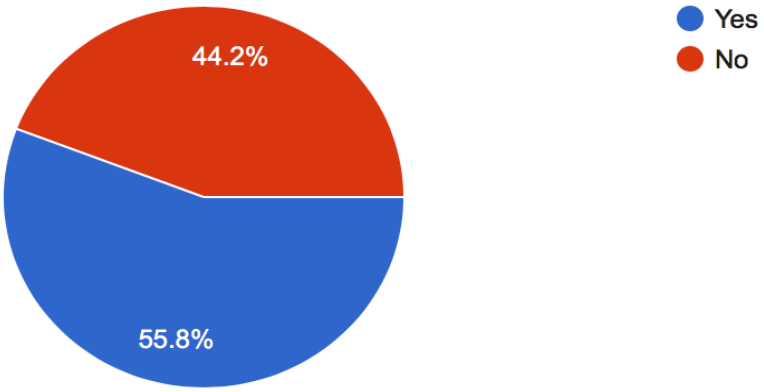


Figure 1: Number of respondents who find enjoyment in learning ICT - specifically coding

This results in low proportion of respondents who want to further their ICT studies.

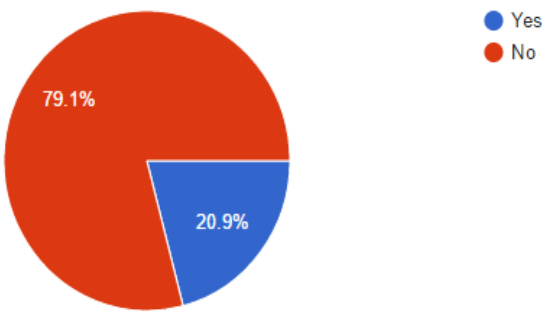


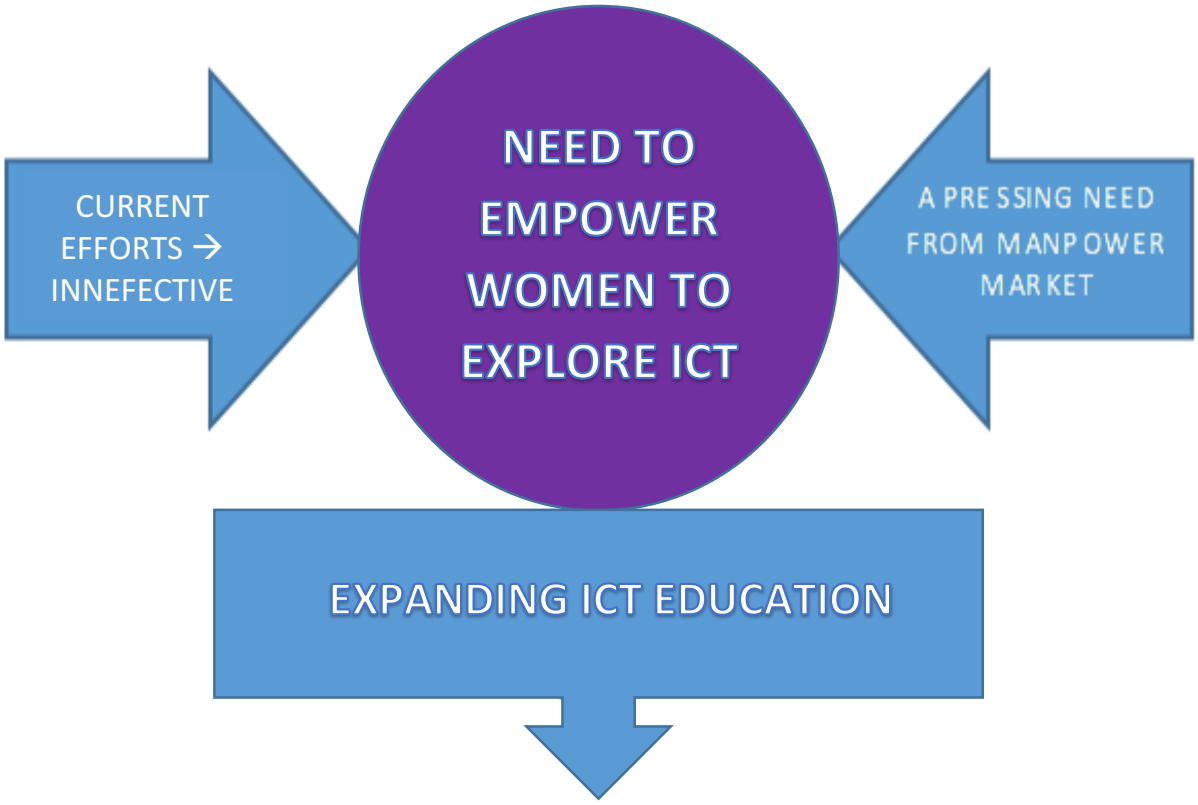
Figure 2: Number of respondents who are willing to pursue ICT-related studies at a higher level

Hence, it is concluded that the current efforts have not been effective in pushing more women into the field. Reasons like lack of continuous learning process[1] and lack of appeal to female students[2] may be the key reasons of unreciprocated attitude towards current strategy of ICT education among female students.

[1] One respondent answered: "classes conducted only fortnightly, the lessons go quite fast and I am usually unable to keep up." The other: "we have too little time to be creative and learn beyond the basics of coding" (Annex B)

[2] "It's hard to follow up and it is boring" (Annex B)

D. REASON FOR PROJECT



WHY ARE WOMEN IMPORTANT?		
Women to take a greater share in the industry → alleviate the current shortage	Narrowing male-female gap can play a key factor to a flourishing economy, as it has been in European Union (ITU, 2012), which has faced similar demographic decline as Singapore (K.P. Ho, 2014)	IT skills are becoming the new indicator for economic success; "the independent women"[3] must not depend on men's technological prowess

Figure 3 Reasons for and Importance of the Project

[3] In Chapter 14 of Simon de Beauvoir's book on feminism, The Second Sex, she raised the idea of "the independent woman" who has emancipated herself from the man. "Beauvoir sets two prerequisites for liberation. First, women must be socialized to engage the world. Second, they must be allowed to discover the unique ways that their embodiment engages the world." (Bergoffen, 2015)

<title> case study and framework of project </title>

Mother Tongue Languages (MTLs) education in Singapore is our case study because of similarities in the challenges faced as compared to ICT education among female students at secondary school level. Both are under-appreciated, given the perceived challenging natures[4] of the subjects (The Kam Family, 2014). Nevertheless, both subjects are crucial in the context of our society. While the MTLs aim to preserve maintain Singapore's cultural identity ("In his own...", 2015), the ICT education among female students is to ensure gender parity in the workforce and efficiency of the workforce.

MTL EDUCATION	LEARNING POINTS [LP]
1. Expansion of formal MTLs education (MTL Review Committee Report, 2010) • MTL Syllabus B and Higher MTL curriculum.	LP1: differentiating the levels of difficulty of content that is taught as well as diversifying the mode of education.
2. Increasing exposure to MTLs through popular media, i.e. smartphone app • "Pintar Kata", by the Malay Language Centre of Singapore → helps Primary school students in learning Malay Language. (Tee Zhuo, 2015)	LP2: using a medium of learning that is relatable to the target audience.
3. Expansion of MTLs education through inter-school events	LP3: using inter-school events to motivate learners to explore the subject in a greater depth.

[4] According to the research that we have conducted, our respondents' initial impressions of ICT are "very difficult to learn", "challenging" (Annex B)

• The Malay Youth Literary Association holds a Malay debate workshop, "*Bahas 4PM"*, which involves youth mentors from the organisation • Competitions for both secondary and post-secondary levels • Series of events are published through their Instagram account, @bahas4pm → gaining popularity	LP4: learning through peer-mentorship method.

Table 1: Case studies and Learning Points derived

Hence, we have devised three plans that emulate the learning points derived by each case study.

PROJECT PLAN	APPLICATION OF LP	LP APPLIED
Online Game	Adjustment to difficulty levels in learning ICT	1, 2
	Fun way of learning	
Competition	Competitions are rewarding and exciting → motivates learning	1, 2, 3
	Different categories based on abilities of participants	
	Participants will be able to learn from their peers and mentors	
Social media-based publication → Instagram	Increasing access to information pertaining to ICT through a medium that is relatable to female students	1, 2

Table 2: Project plans and application of LP

These plans are integrated in an initiative named "Girls DynaMITE. "Girls DynaMITE" itself is an abbreviation for "**Girls M**aking **ICT** a Lifestyl**e**". It portrays our aim to make ICT an integral part of the female students' lives.

Each plan also complements each other.

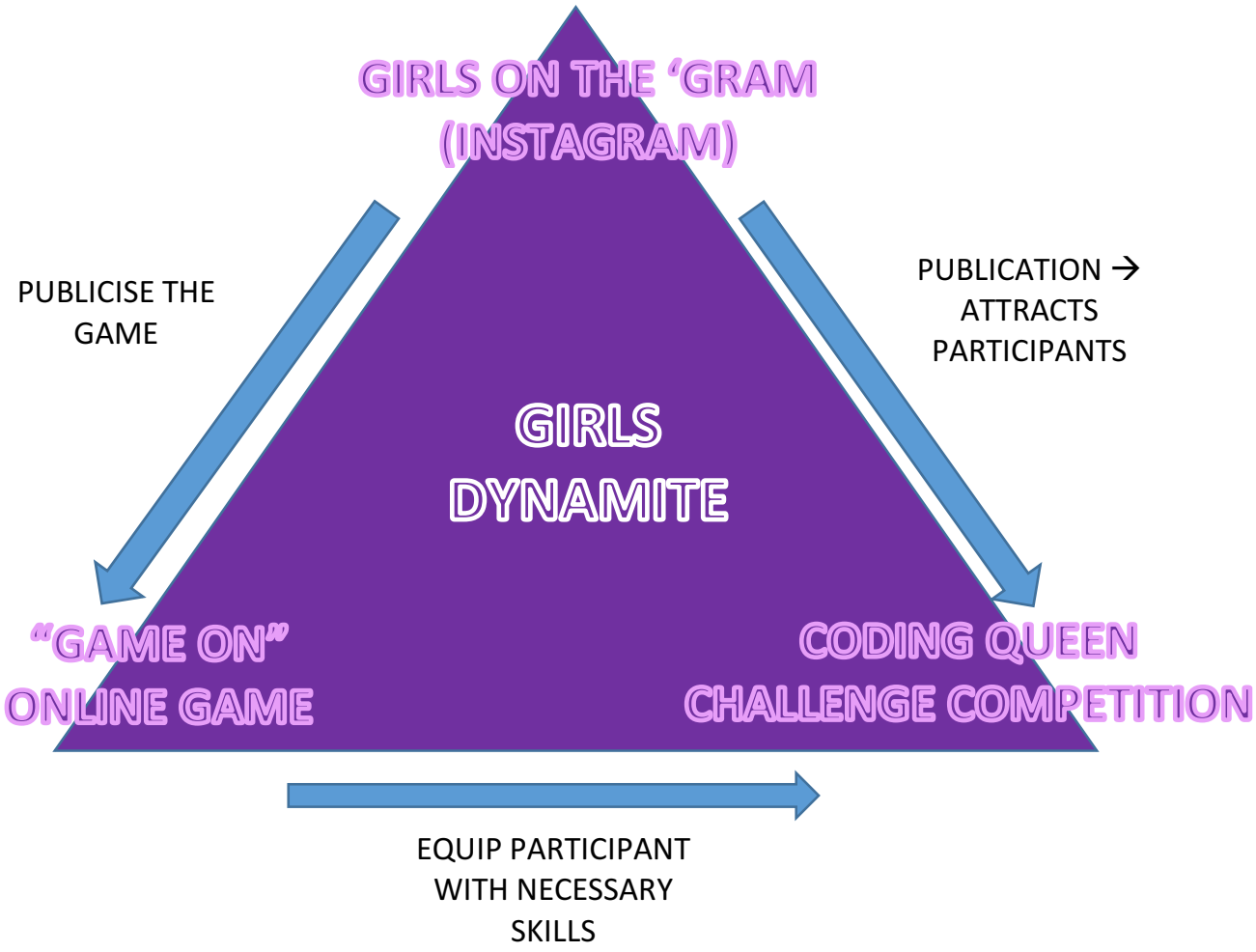


Figure 4: Each project plan in relation with each other


<title> project plans </title>

A. CODING QUEEN CHALLENGE

1. OVERVIEW

This is a 2-day training-cum-competition event. All female students in Singapore's secondary schools are eligible to sign up [LP 3]. The participants will be trained and compete in three categories: "Duchess", "Princess" and "Queen", of increasing difficulty level [LP 1][5]. Each school can send one team of 3 for each category.

Part of the event will be separate training programme for each category [LP 5]. After the training, participants will apply the ICT knowledge they have learnt to solve real-life problems and deliver a presentation to a panel of judges. Outstanding participants will be awarded medals and/ or Special Awards which include "Most Creative Design" and "Best Presentation".

2. AIM

The "Coding Queen" Challenge aims to expose and attract female students in Singapore's secondary schools to the field of computing and ICT. Activities that many women have found significant include mentoring students and employees or communicating with colleagues and customers (Abbate, 2010). Also, training programme empowers participants to inspire like-minded individuals and builds support groups among them, hence sustaining their interest and passion in ICT.

[5] refer to Annex D for details on syllabus for each category

3. PROCESS

a. Day 1: Training programme

Figure 5: Generic flow of the programme

Focus 1: Problem-solving approach

- Teach the participants how to analyse and approach the problems.
- Let the participants think of some real-life problems and discuss solutions.
- Evaluate others' solutions and propose suggestions.

Focus 2: Relate to personal interests

- Allow participants to discuss and work on problems of their chosen fields such as Art or Mathematics.

Focus 3: Community of support

- Group learning enables participants to help each other and forge friendship.

b. Day 2: The Final Challenge

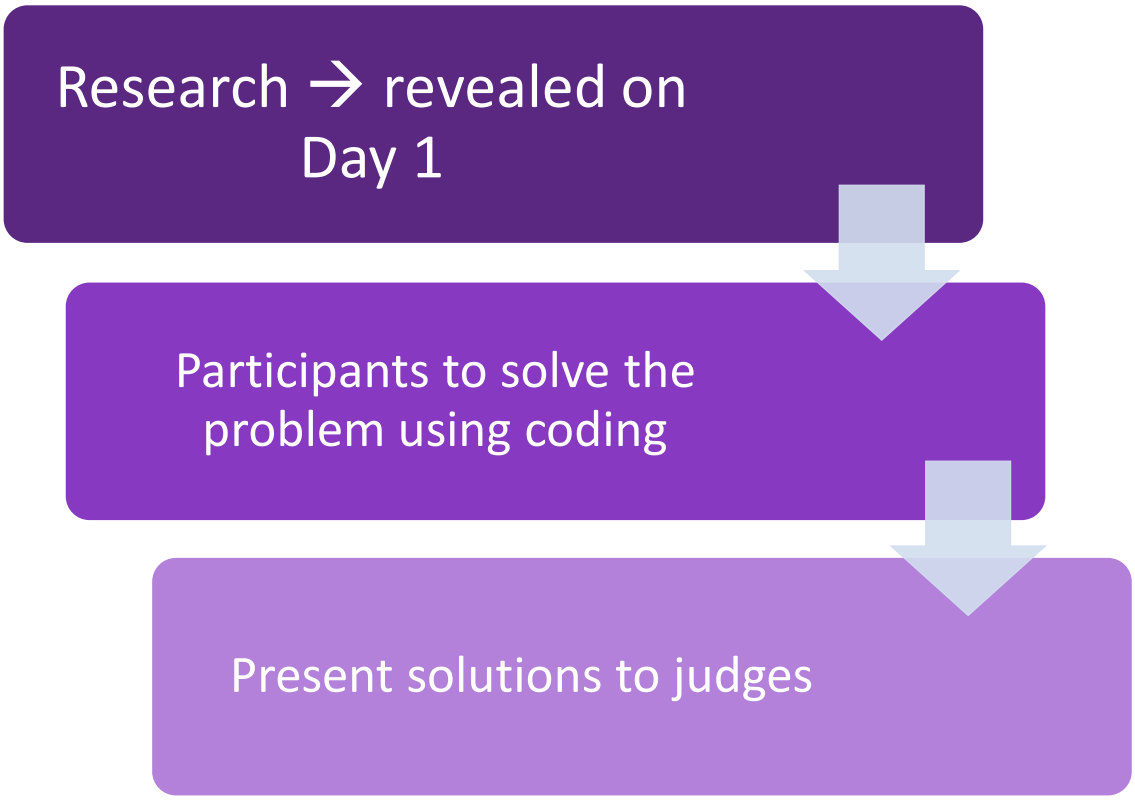


Figure 6: Generic flow of the final challenge

c. Sample Challenge

MRT Wizard	• Participants use algorithms to find out the shortest route from one station to another

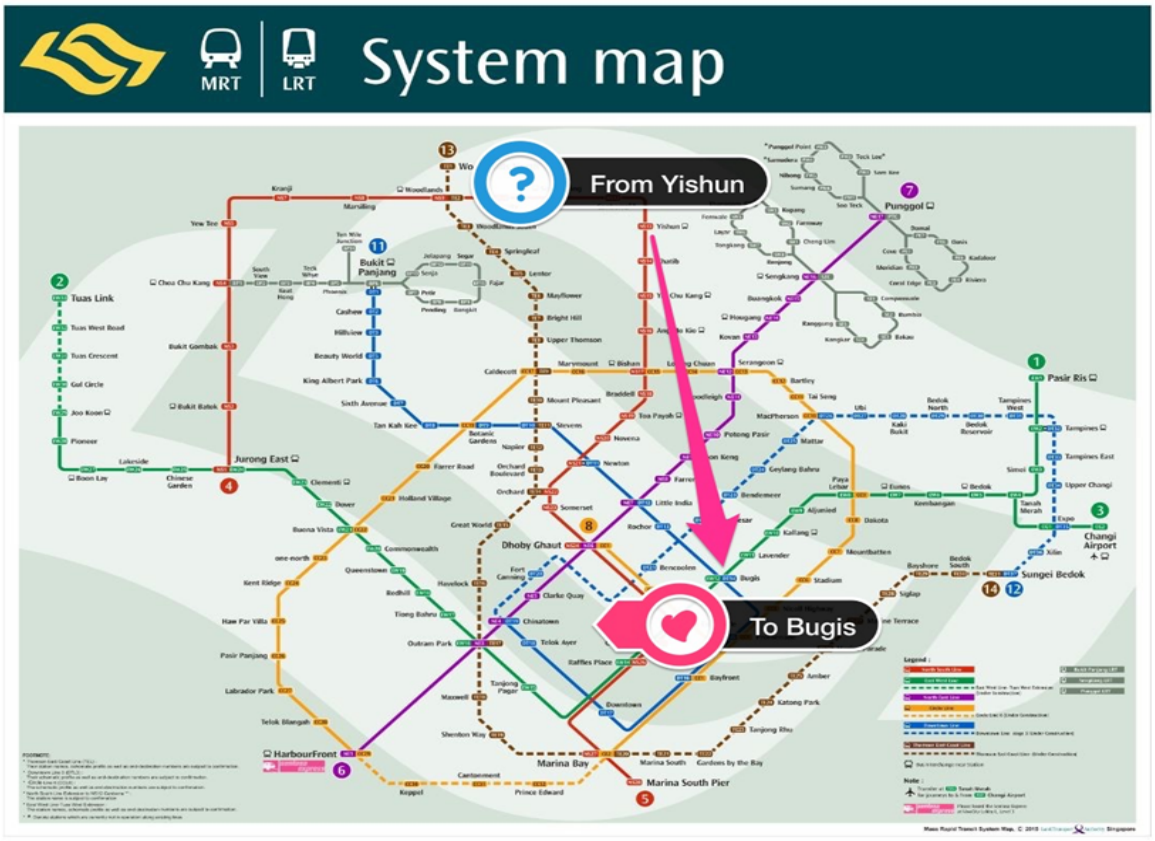


Figure 7: MRT Wizard Challenge visualisation

4. FEASIBILITY

The rewarding experience of competition motivates them to overcome difficulties they faced during their learning process. The task is set in real-world context, and hence enables them realise the relevance of ICT. Whilst, peer mentoring workshop builds a community of like-minded female students who share their expertise and experience in ICT area.

Poster and details of syllabus, event and sign-up will be e-mailed to HODs of ICT in secondary schools across Singapore to publicise our event.

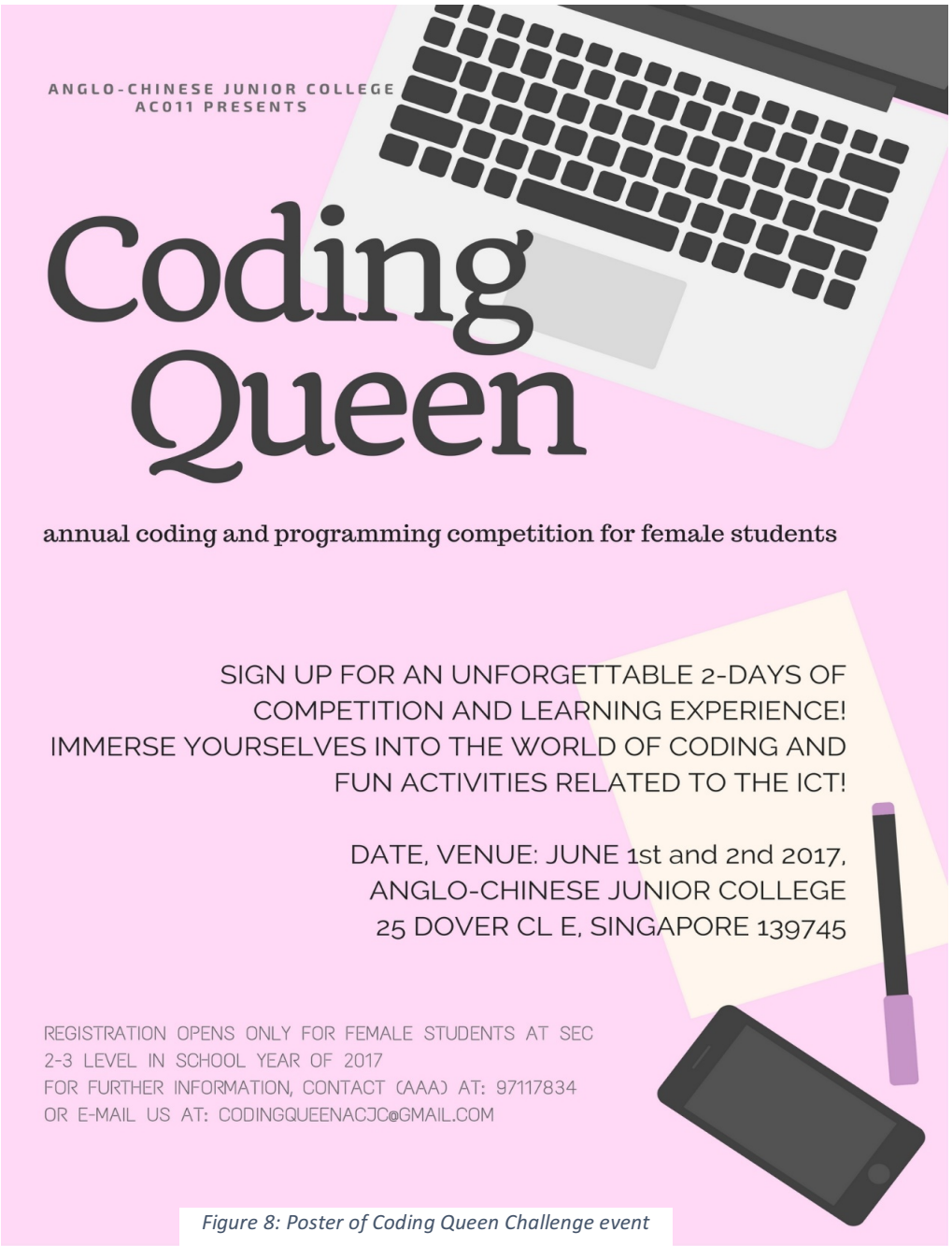


Figure 8: Poster of Coding Queen Challenge event

Based on the survey we conducted, 27.9% of the female students who have not seen our project plan were willing to participate in coding competitions.

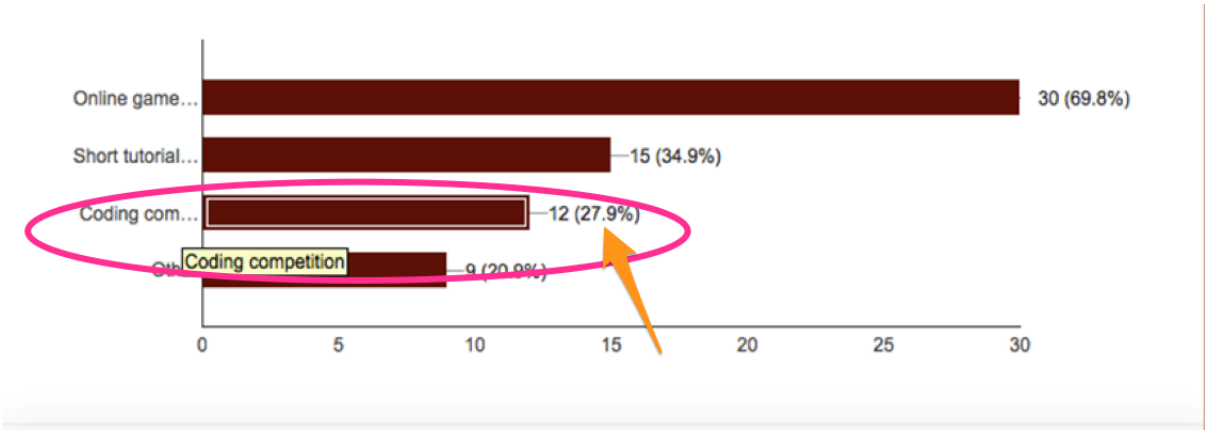


Figure 9: list of preferred Project Plans

After we incorporated game-like tasks and peer-mentoring in the "Coding Queen" Challenge to increase the appeal of project, we conducted another survey to the same group of respondents. Most respondents are interested in participating.

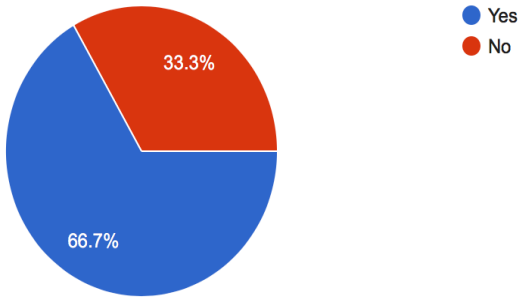


Figure 10: Number of respondents who are interested to participate in the Coding Queen challenge

5. MANAGEABILITY

The event is open to all secondary school female students in Singapore; up to 200 participants. We will recruit volunteers from ACJC. Weekly meetings will be arranged at least two months in advance to plan and prepare for the challenge. Our group will book the venues for preparation and on event day, and check all facilities (computers, projectors) are in proper function.

Moreover, after consulting with teacher-in-charge of ACJC's Science and Mathematics Council (SMC) who frequently conducts similar programmes[6], our project is deemed to be "workable" (Soong, 2016).

Stakeholders	Collaborating with: o SMC Possible sponsors: Infocomm Development Agency (iDA), National University of Singapore's School of Computing
Potential Problems → Possible Solutions	• Limited funds → crowd-funding through gofundme.com • Volunteers not sufficiently trained → start training early; multiple dry-runs & contingency plans

Table 3: Additional strategies to ensure the manageability of our Project Plans

[6] Such programmes include the annual International C. B. Paul Quiz, a science competition organised for secondary school students across Singapore.

B. “GAME ON” ONLINE GAME

1. OVERVIEW

The plan aims to teach female students coding language by integrating coding into a roleplaying game (RPG) that will be put up online. It is online for easier access and distribution to all students.

2. AIM

The plan aims to teach female students coding language by integrating coding into an online role-playing game (RPG).

3. PROCESS

The game follows a female protagonist who takes up arms to fight monsters and protect her village. Players complete tasks and fight overworld monsters by answering code-related questions in a multiple-choice question (MCQ) form. The game will also provide hints and tips if the players get stuck. The game ends once the player encounters the dragon, and answers 30 MCQ questions correctly.

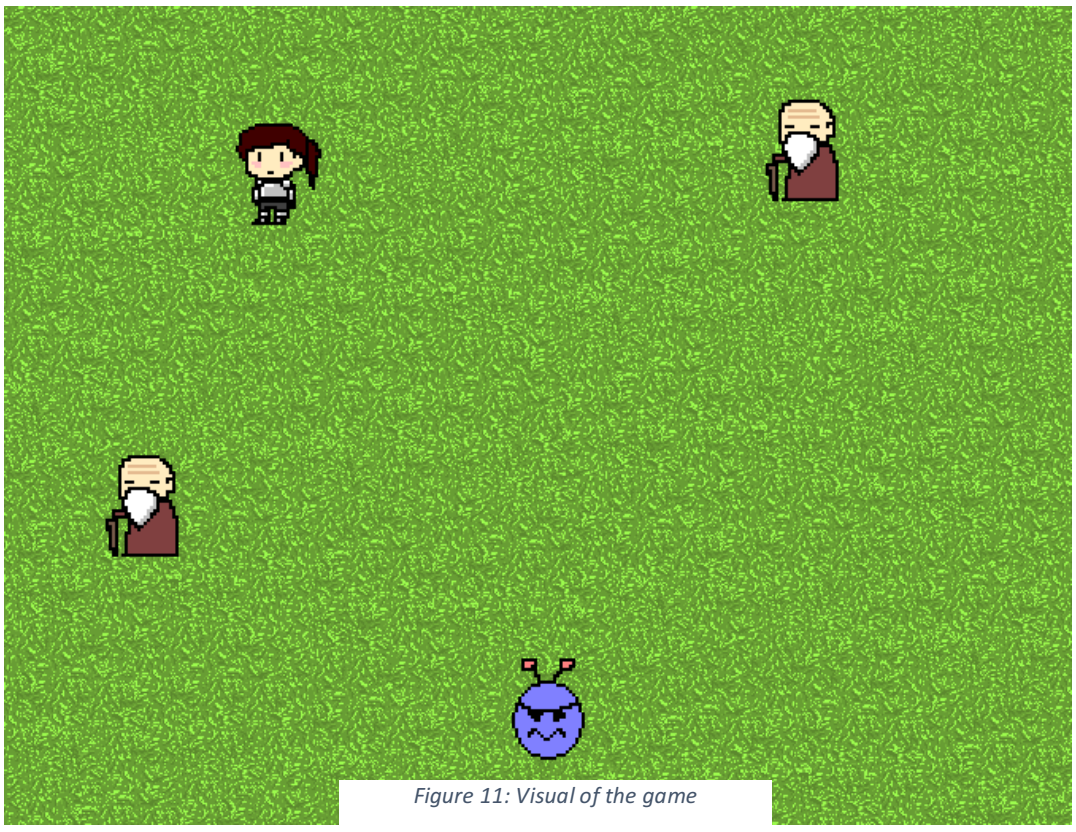


Figure 11: Visual of the game

As the players progress, the code gets more difficult, ranging from asking for the basic HTML on how to bold a text to inputting a simple code on designing a site with a title, body, and hyperlinks.

4. FEASIBILITY

We can request for ACJC's Tech Council to help program the game. and call for student volunteers to be on the creative team to help develop storyline and create graphics. Coding of the game can be done using free game creation softwares such as "GameMaker" while creation of graphics can be done using free softwares such as "FireAlpaca".

The use of video games adds to the fun factor of learning code, thus prompting students to be more intrigued by it. All respondents of our follow up survey would play the game; majority agrees that it would possibly increase their overall interest in ICT.

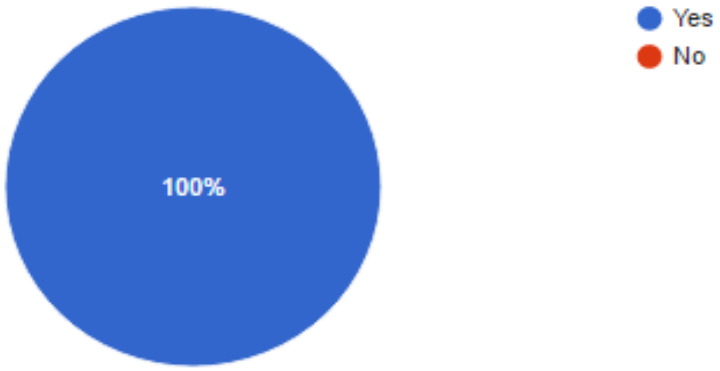


Figure 12: Number of respondents who are willing to play the game

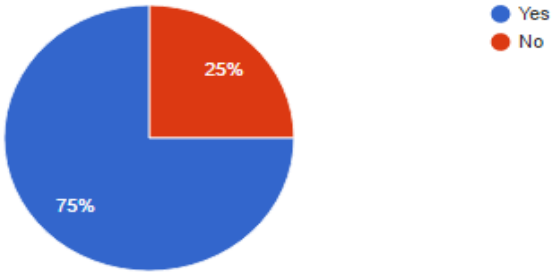


Figure 13: Number of respondents who believe that the game will help to increase their interest in ICT

5. MANAGEABILITY

Programming the game may take a long time. However, with a larger team consisting of members of ACJC's Tech council and student volunteers, creation of the game will be sped up. Furthermore, online servers may crash due to the projected byte size of the game. To mitigate this, a file of the game may be distributed to students as a last resort.

C. GIRLS ON THE 'GRAM

1. OVERVIEW

As technology has become such an integral part of our lives, our group devised a social media campaign that would motivate females to learn and develop modern IT skills. Given that the first two project plans focus on coding, our third project plan focuses on developing basic graphic design skills on applications such as Adobe Photoshop and Lightroomas well as HyperText Markup Language (HTML) codes.

2. AIM

While there are some dedicated Instagram pages for teaching graphic design fundamentals, none of them specifically target females. Our aim is to integrate an effective teaching of graphic design basics and information pertain to women in ICT that appeals directly to female secondary school students in Singapore.

3. PROCESS

We have created an Instagram page (@girls_dynamite) dedicated to our project and reach out to as many secondary school female students as possible by publicizing this page through word-of-mouth and by mass following Instagram profiles of our target audience. These are the items that will be posted:

Adobe Photoshop Skills	Utilising several instructional videos from YouTube, we will post basic media-editing tutorials that is comprehendible, on a daily basis
	Progressively increase the difficulty of tutorials, starting from fundamental basics such as "magic eraser", cropping and clone-stamping to more advanced skills such as vector adjustments → a seamless "syllabus"

HTML Tutorial	A series of infographic/ videos on introduction to HTML; introduce participants to the blogging platform Tumblr which can be customised using HTML coding.
Influential women in ICT	We will craft out a series of infographic on women who are influential in ICT sector → programmers, inventors, IT professionals

Table 4: Items that will be posted on the Instagram account

To assess the success of this strategy, we will monitor the number of views of our videos to measure the extent of our outreach to our target audience, as well as the complexity of the Tumblr pages that participants will be invited to share with us.

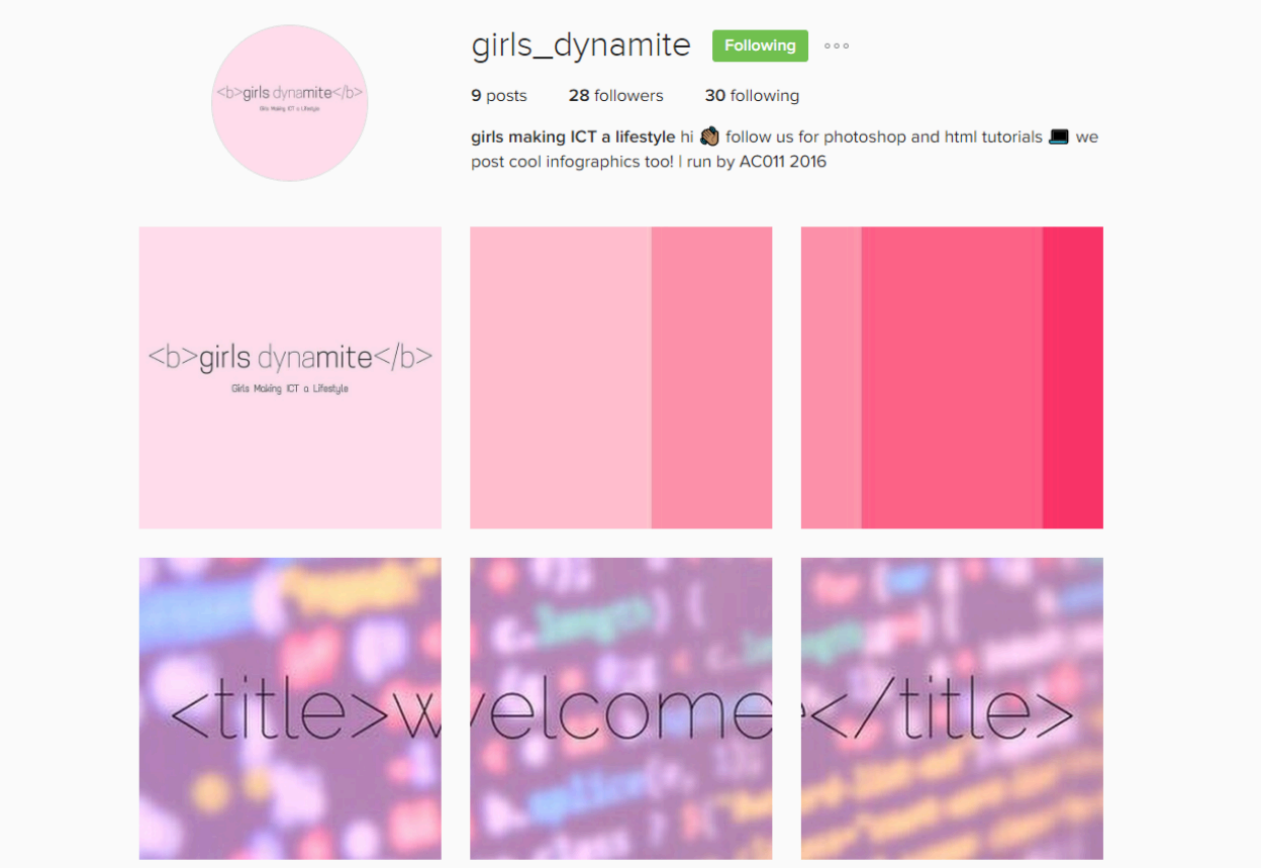


Figure 14: Screenshot of @girls_dynamite account

4. FEASIBILITY

Using the social media platform Instagram is particularly effective as social media platforms are particularly popular amongst teenagers, as shown by a survey by Pew Internet, which shows that over 50% of teens aged between 13 and 17 are active users of Instagram[7]; this method of teaching basic graphic design skills with have the most outreach to our target audience. Furthermore, our target audience has concurred that they would like to follow our Instagram page, which confirms that they are receptive of this strategy.

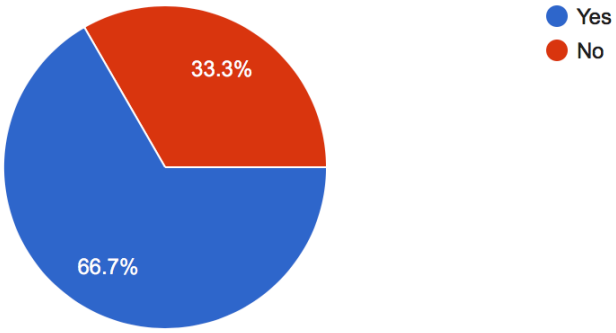


Figure 15: Number of respondents who are willing to follow our Instagram page

5. MANAGEABILITY

This is particularly manageable because there is a plethora of useful videos on coding basics already available on the internet. Sustaining sufficient content on our page regularly can be done by any of our group members, thus no external help from other parties would be required.

[7] Pew Research—Teens, Social Media & Technology Overview 2015 (Annex E)

<title> conclusion </title>

A. PLAN REFINEMENT

	SCOPE	SCALABILITY	SUSTAINABILITY
OVERALL — ENCOMPASSES ALL THREE PLANS	Make the project a common effort of different stakeholders → volunteers from different walks of life: female students, educators, and professionals		Set up a permanent committee to coordinate the project annually
"CODING QUEEN" CHALLENGE	Can be expanded to involve Junior College/ Polytechnic students → help students to explore ICT in tertiary education	Increase participation and outreach by inviting other schools' related CCAs to collaborate → SMC, Tech Council	
"GAME ON" ONLINE GAME	Diversify the characters in the game → includes male characters	Advertise on popular game website such as http://store.steampowered.com	Source for experts → regularly maintain the game website
GIRLS ON THE 'GRAM	Broaden the topics of the posts → C++ codes, Javascript tutorials	Influence-advertising: Link with accounts with more than 500 followers on social media → increasing popularity using Instagram's algorithm	Appoint persons in charge to keep the account active → from partner organisations

Table 5: List of possible refinements to existing Project Plan

B. CONCLUSION

Although it might take some time for the project to gain awareness, once a stable 'customer base' is established, our project is manageable and sustainable. Each project can be executed with careful planning and the help of volunteers and ICT specialists.

In the long run, the project plans can remain applicable as they are designed to be easily modified. With the underlying rationale behind each project to promote a shift in mindset of female students towards ICT, the project is highly significant as long as technology plays an important role in our lives.

<title> bibliography </title>

BIBLIOGRAPHY

BOOKS, PRINTED MATERIALS

- Abbate, J. (2010). The Pleasure Paradox: Bridging the Gap Between Popular Images of Computing and Women's Historical Experiences. In Thomas J. Misa (Ed.), *GENDER CODES: Why Women Are Leaving Computing* (pp 213-228). Hoboken, New Jersey: John Wiley & Sons, Inc.
- de Beauvoir, S. (1949). *The Second Sex*. First Vintage Books Edition.

ONLINE ARTICLES

- In his own words: English for trade, mother tongue to preserve identity. (2015, March 27). *The Straits Times*. Retrieved from http://www.straitstimes.com/singapore/in-his-own-words-english-for-trade-mother-tongue-to-preserve-identity
- Ho, K.P. (2015, March 5). Europe's baby bump holds lesson for Singapore. *The Straits Times.* Retrieved from http://www.straitstimes.com/opinion/europes-baby-bump-holds-lessons-for-singapore
- Ho, O. (2015, June 20). Wanted: Female Stem Professionals*. The Straits Times.* Retrieved from http://www.straitstimes.com/singapore/wanted-female-stem-professionals
- Lee, H. L. (2014, November 24). Launch of Smart Nation Initiative. Speech. Retrieved from http://www.pmo.gov.sg/mediacentre/transcript-prime-minister-lee-hsien-loongs-speech-smart-nation-launch-24-november
- Lee, P. (2016, June 29). 19 Schools to Offer Programming at O Level. *The Straits Times*. Retrieved from http://www.straitstimes.com/singapore/education/19-schools-to-offer-programming-at-o-levels

- Tan, W. (2016, February 8). IT Talent in short supply amid Smart Nation Push. The Straits Times. Retrieved from http://www.straitstimes.com/singapore/manpower/it-talent-in-short-supply-amid-smart-nation-push
- Tee Z. (2015, June 15). Pick up Malay Words with New App. *The Straits Times*. Retrieved from http://news.asiaone.com/news/singapore/pick-malay-words-new-app
- The Kam Family. (2014, September 30). Why is it so difficult to learn Chinese in Singapore [Blog post]. Retrieved from http://www.thekamfamily.com/2014/09/why-is-it-so-difficult-to-learn-chinese.html

NONPERIODICAL DOCUMENTS AND REPORTS; DISSERTATIONS

- Babin, R. (2010). *The Key Influencers in High School Student ICT Career Choice.* Retrieved from http://www.isedj.org/8/26/ISEDJ.8%2826%29.Babin.pdf
- Gurumurthy, A. (2004). *Gender and ICTs: overview report*. Retrieved from http://www.academia.edu/download/43263062/CEP-ICTs-OR.pdf
- International Telecommunication Union (ITU). (2012). *A bright future in ICTs: Opportunities for A New Generation of Women.* Retrieved from https://www.researchgate.net/publication/278029298_A_Bright_Future_in_ICTs_Opportunities_for_a_new_generation_of_women
- Ministry of Education & University of Cambridge Local Examinations Syndicate. (2015). *COMPUTER STUDIES GCE Ordinary Level (2017) (Syllabus 7017).* Retrieved from http://www.seab.gov.sg/content/syllabus/olevel/2017Syllabus/7017_2017.pdf
- Mother Tongue Languages Review Committee Report. (2010). *Nurturing Active Learners and Proficient Users.* Retrieved from

- National University of Singapore. (2015). *Summary of Graduate Student Enrolment (2015/2016).* Retrieved from http://www.nus.edu.sg/registrar/info/statistics/gd-enrol- 20152016.pdf
- Wells, JA. (2010). Marketing Theatre to the Millennial Generation: A Marketing Initiative for Stageworks, a Professional Regional Theatre in Tampa, Florida (doctoral dissertation). Retrieved from http://s3.amazonaws.com/zanran_storage/dspace.lib.ttu.edu/ContentPages/107462049.pdf

PERIODICAL JOURNALS

- Bergoffen, D. (2015). Simone de Beauvoir. *The Stanford Encyclopedia of Philosophy (Fall 2015 Edition).* Edward N. Zalta (ed.), Retrieved from http://plato.stanford.edu/archives/fall2015/entries/beauvoir/
- Milizewska, I. (2010). Encouraging Girls to Consider a Career in ICT: A Review of Strategies. *Journal of Information Technology Education: Innovations in Practice, Volume 9 2010.* Retrieved from http://www.informingscience.org/Publications/1292
- Ng, P. (2011). Language Planning in Action: Singapore's Multilingual and Bilingual Policy. *Ritsumeikan Asia Pacific Journal 2011, volume 30, ppl - 12*. Retrieved from http://ci.nii.ac.jp/naid/120004929263/

WEBPAGE

- International Telecommunication Union (ITU). (n.d.). Why a Girls in Information and Communication Technology (ICT) Portal?. Retrieved from http://girlsinict.org/about/Why-a-Girls-in-ICT-Portal
- Mid-Pacific ICT Centre. (n.d.). What Is ICT Education and Why Is It Important?. Retrieved from http://www.mpict.org/ict_education_defined_importance.html

- Nesta. (2014, April 3). Female Fuel for the Digital Economy. Retrieved from http://www.nesta.org.uk/blog/female-fuel-digital-economy
- Smart Nation. (n.d.). Why does Smart Nation Matter?. Retrieved from http://www.smartnation-forbes.com

PRESS RELEASE

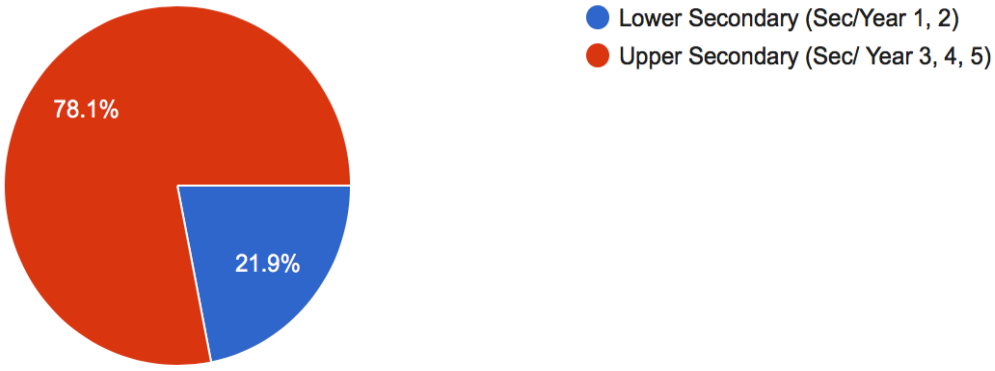
- Phaidon International. (2014). *Inclusive Talent Strategy Event: How to attract and secure diverse STEM talent* [Press Release]. Retrieved from http://girlsinict.org/events/diverse-stem-talent-overcoming-recruitment-retention-barriers

<title> annex </title>

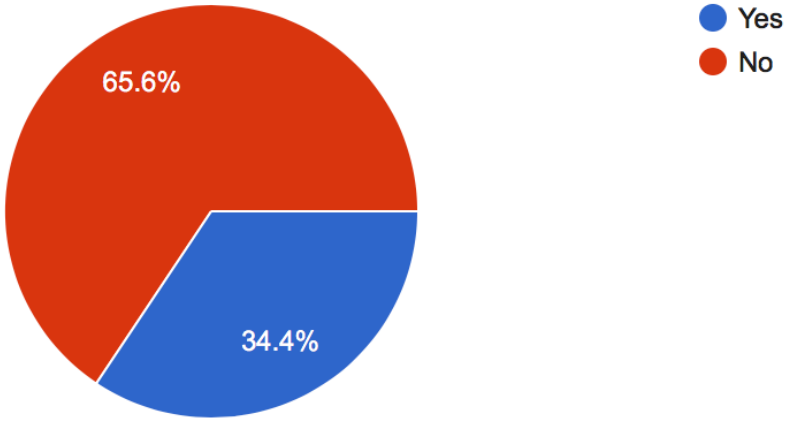
TABLE OF CONTENTS

ANNEX A: GENERAL ATTITUDES TOWARDS ICT AMONG FEMALE STUDETS AT SECONDARY SCHOOL LEVEL

Are you in: (32 responses)



Currently, are you interested in ICT? (32 responses)



Why/ why not? (32 responses)

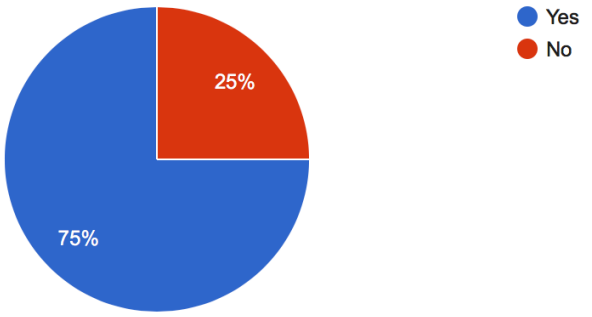
too technical
too technical
Too technical
Too technical
Dank memes
I can't seem to comprehend, too technical.
Probably lack of exposure to IT
Exposure to IT
I dont really know what it is
too technical then i will gong
Encouragement in pursuing IT and exposure through school lessons.
I'm bad with tech stuff, it's boring
Not my thing.
Encouragement
Interested but lack of experience and knowledge
My interest in all about biology and medical
It is useful and colse to today
because it's vital for survival in this generation
Lack of IT skills & interest
not interested personally
I have little exposure to the workings of ICT?
I'm more interested in humanity
Lack of.understanding
Primary school CCA
The degree of my eyes are high enough and I don't think I should make my degree go up any higher
Lack of knowledge
I prefer paperwork.
lack of encouragement
Very interesting.
Lack of time to explore
A very useful tool to have for working in groups or in future projects

What do you think info-comm and technology (ICT) is all about? (32 responses)

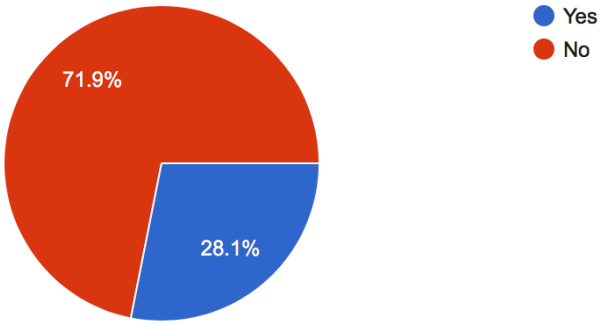
dank mems
Coding
Finding resources for information. Sort of like news and working with computers for programming
Technology
research and development
computer design stuff?? Idk
coding or computing or making softwares and applications or sth
About getting software to do things for youm to help you in your daily life.
About internet and computers
Things related to softwares and like coding etc
ovaries
Electronic communication based on advance technology
the modern technology, computer programs, and things related to it
It is about the usage of computers and technology to increase productivity in our society
About Internet and better communication
Good

A useful skill for Everyday life
Computer and technology? I don't know what exactly is ICT
not much
Computers and smart devices
Computer science
not very sure
Computer and technology
Computer things
Technology related staff
i think its about all the stuff we have now like phones, computers, animation, etc.
Managing and utilising new age technology to carry out certain tasks and jobs.eg programming
computer science
Computers
It is important.
The use of technology
Programming and computer functions

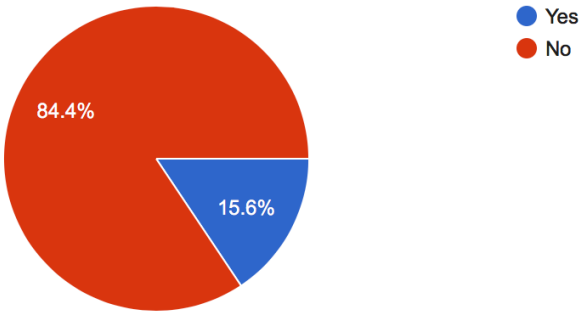
Would you be interested to know/learn more about ICT? (32 responses)



Would you be interested to major/ work in ICT-related field? (32 responses)



We are considering to hold an activity to interest female students in ICT. Would you be interested to participate?
(32 responses)



ANNEX B: GENERAL ATTITUDES TOWARDS ICT AMONG PARTICIPANTS OF CODING CLASSES

Prior to coding classes, what was (were) your impression(s) of ICT?

(43 responses)

Fun
Fun
boring
boring
Complicated job
It seemed fun and interesting
That it was boring.
I wanted to learn how to code as I found it really interesting and fun.
It would be fun & interesting.
That they were boring and uninteresting really hard to do.
Impressive, cool & interesting
It is fun and exciting
Conplicated and fascinating
Computers are computers. That's nice I guess.
Geeky
Very difficult and time consuming to learn
Complicated numbers and words

too complicated for me
It is interesting.
It was really difficult and it was meant for people who were more inclined towards Math and Science
It is quite a complicating task.
relatively enjoyable
ICT is for guys and enthu engineer girls, and coding is boring
kinda cool to be doing all those coding
I thought that ICT was enjoyable but yet complicated and difficult
Boring but necessary to learn
I was quite interested in it and thought that it would be fun.
i thought it was going to be boring
It was a very intense subject of learning how to do programming, very tough, complex, detailed
complicated
Very complicated and hard
stranger
I thought that it was a waste of time learning about ICT because it wouldn't be valuable in the future when there are so many other platforms that we can use.
That it would be complicated but a really cool skill
Cool, fun and science-y.
It is quite difficult, though IT can be "conquered" through practice and exploration. BUT, I am hopeless at IT.
Basically just that disc and computer codes were made up of zeroes and ones

Boring
I thought that it was quite boring.
It is quite boring
Very hard to make
Interesting
I'm really bad at it and I'm not exactly interested in IT to be honest

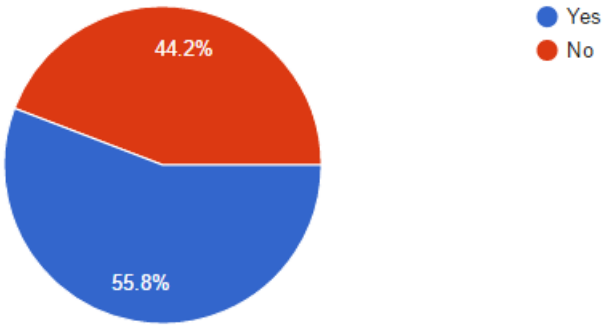
How have coding classes change your impression(s) of ICT? (43 responses)

Yes
Yes
No
No
It's pretty simple if you understand what you are doing.
It showed me that it wasn't really as easy as it seemed.
It was actually more fun than expected.
Coding classes have made ICT more enjoyable
I have come to know that coding is not apt for me and it is boring and really difficult.
Yes, definitely.
Its actually very fun. It's just like you are playing a game
That it would be very easy
Even more complicated and less fascinating
ICT is serious!
ICT is occasionally frustrating
somewhat useful
Lots of writing and logic involved
It become worst as i found out truly how difficult it was
still complicated, but a little less
It showed me how useful ICT could be.

It helps me understand better about how the computer works
they haven't changed
Coding is for everyone and found almost everywhere on the internet- what we do online was started up by someone who knows at least the basics of code to make it happen
nope
Not really, just gave me a better insight
Nope.
It's complicated and I'm lazy to remember the codes
i realised that it is actually quite cool and interesting
Not really, but it did give me a clearer idea about what it was
I realised that coding is actually a really important up and coming field that involves a lot of hard work and focus.
Its actually not that hard and quite fun
interesting + easy to catch on but hard to memorise
No, I still stick to my belief that coding/ICT is a waste of curriculum time but one thing that is good is that it challenges you to think
I still find it kind of complicated but it is not as boring as I thought it would be. It is quite engaging.
It made me realise that ICT is slightly harder than I imagined it to be.
ICT is more than just a computer and an air-con room. It can be interesting too.
we have to use words and the correct symbols for each command. otherwise, it won't work
ICT is actually more complicated than i think
I realised that coding is actually fun
Yes.
ICT is made up of very simple stuff

Boring
it just made me dislike it more as i find it so hard to understand

Do you find enjoyment in learning about coding? (43 responses)



If you have answered "yes", which aspect(s) of coding classes do you enjoy?

(26 responses)

When the code actually works. And I did it all by myself.
Working on it alone, and trying to figure out the problems on my own
When we learn rather complex commands.
I enjoy making the computer ask questions to the user and do math calculations
That the fact that I can actually do something that I do not like and that coding is actually quite easy as you just have to grasp the concept and then apply it into the same way you had learnt it.
The part where we code for quizzes and code report cards
We get to learn how programmes work
We were actually programming without using programmes like an easy game creator and stuff.
Figuring out how to solve problems without being told hints.
Writing game programs
Learning how codes are actually used in our daily lives
probably learning how to use codes
'Ordering' computers what to do.
-
learning the way things work
-NA-
That every small detail plays a major role.
Making our own codes
coding?

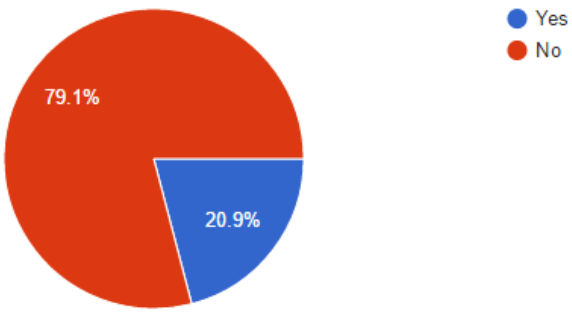
I just find it pretty cool and amazing how what I code somehow makes the computer 'answer' in a certain way
Forming codes and attaining the result that you are supposed to get/want to get.
learning coding. (i didn't even know it existed)
The learning.
The games
Feeling of accomplishment when I finish something
nope nothing
I do not find that I will apply it in my life later on, and I find that I am not learning anything through it as most of us do not know what we are doing.
It was boring (kinda like math) and it would get frustrating at times when I could not get the code right
its just the fact that I can't remember the codes at all
I'm very sorry. The teacher is great, allows us to explain, ensures we understand what she is saying. However, as we are always short of time, expecially with these classes conducted only fortnightly, the lessons go quite fast and I am usually unable to keep up. Besides that, I enjoy the lessons, finding satisfaction when I get the coding right and the programme runs smoothly.
There isn't an aspect to be honest but I don't like the class on a whole because I feel that it's not applicable to me in the future and is just a waste of curriculum time.
having to be so exact makes me frustrated when I accidentally type an uppercase letter instead of a lower one and its in a really long code and i cant find the mistake.
complicated
Coding itself if dry and not for everyone
It's hard to follow up and it is boring
im not good with IT stuff and it frustrates me because i do try but i can't get it

If you have answered "no", which aspect(s) of coding classes do you not enjoy?

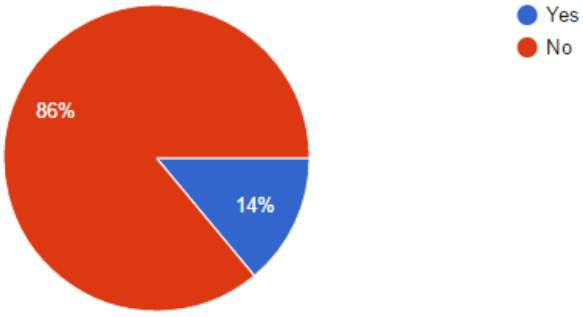
(24 responses)

-
-
-
-
Basically, keying in the set of instructions.
I am just terrible at coding
the memorising of fixed codes and commands
It is very tedious and if u make a mistake u have to start over
hard to grasp and understand at times
It is tedious and time-consuming.
The algorithms and different terms.
It is kind of confusing sometimes as to how the computer works...
writing the code
We have too little time to be creative and learn beyond the basics of coding. Most of us don't bother to do coding outside the classroom
I do not find that I will apply it in my life later on, and I find that I am not learning anything through it as most of us do not know what we are doing.
It was boring (kinda like math) and it would get frustrating at times when I could not get the code right
its just the fact that I can't remember the codes at all

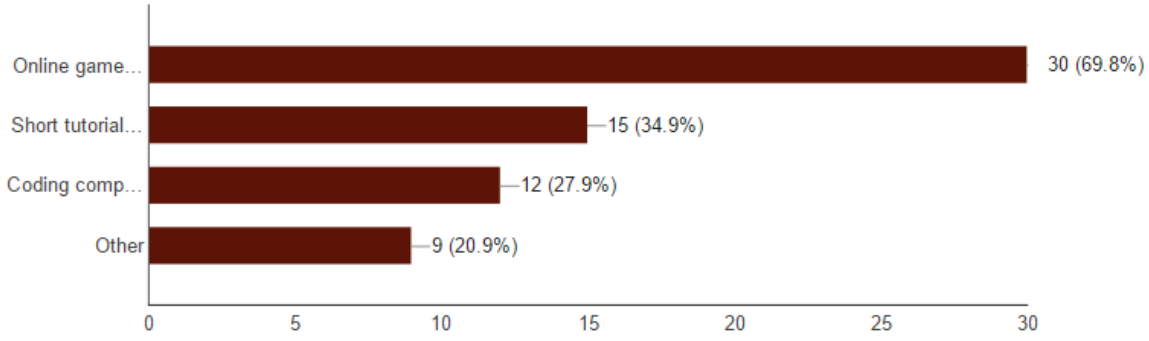
Do you want to further your studies in ICT-related majors? (43 responses)



Are you interested to take up a career in ICT industry? (43 responses)

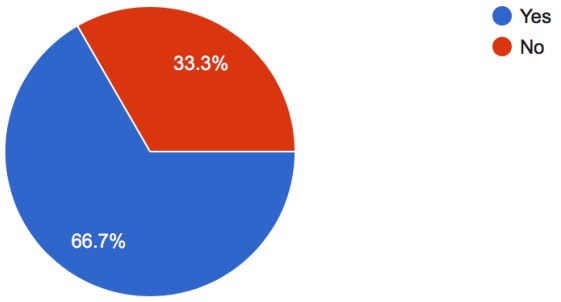


What do you think would increase female students' interest in ICT?
(43 responses)

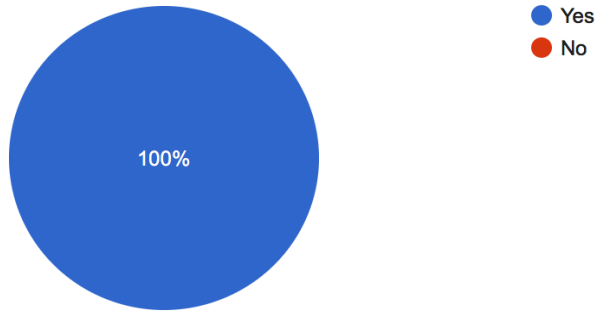


ANNEX C: RESPONSES TO PROTOTYPES OF PROJECT PLANS

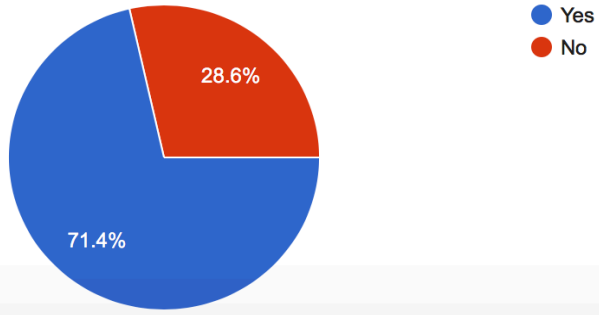
Would you be interested to participate in the coding competition? (21 responses)



Our team is developing an RPG online game that incorporates elements of HTML coding into it. Would you play it?
(21 responses)

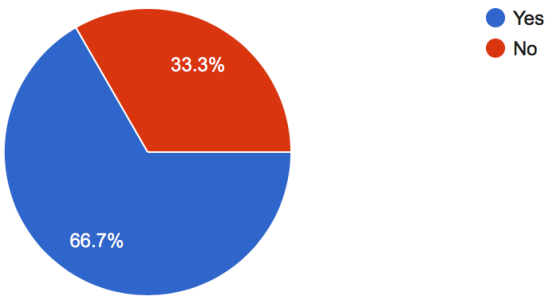


Do you think it would make you more interested in ICT? (21 responses)



We will be launching a social media page to post some photoshop and HTML coding tips and tricks! Would you follow it?

(21 responses)



ANNEX D: OPERATION MATERIALS FOR CODING QUEEN CHALLENGE

1. TIMETABLE OF EVENT

Day One Timeline				
Time			Activity	Venue
8 30	–	9 00	Registration	Concourse
9 00	–	9 30	Opening Ceremony	Lecture Theatre 4
9 30	–	12 15	Peer Mentoring Workshop (Basic)	Computer Lab
12 15	–	13 00	Lunch	Outside Computer Lab
13 00	–	16 00	Peer Mentoring Workshop (Advanced)	Computer Lab
16 00	–	16 30	Tea Break	Outside Computer Lab
16 30	–	17 00	Briefing: Research Area Revealed	Lecture Theatre 4

Day Two Timeline				
Time			Activity	Venue
9 00	–	9 15	Final Briefing: Specific Task Revealed	Lecture Theatre 4
9 15	–	12 15	Challenge (technical solution)	Computer Lab
12 15	–	13 00	Lunch	Outside Computer Lab
13 00	–	14 40	Bonus Discussion Time	Computer Lab
14 40	–	16 00	Presentation (showcase)	Lecture Theatre 1

16 00	–	16 30	Tea Break	Outside Computer Lab
16 30	–	17 30	Closing Ceremony	Lecture Theatre 4
17 30	–	18 00	Buffet and Networking Session	Concourse

2. "CODING QUEEN CHALLENGE" SYLLABUS

Levels/ Categories	Difficulty level	Overview
Duchess	Lower than O Level Computer Studies (Syllabus 7017)	Concept of a program and flowcharting
Princess	Same as O Level Computer Studies (Syllabus 7017)	The sections of the syllabus are: - Applications of computers and their social and economic implications - System life cycle - Problem solution, including algorithm design, programming concepts and logic gates - Generic software and the organisation of data - Hardware, systems and communication (MOE & UCLES, 2015)
Queen	Higher than O Level Computer Studies (Syllabus 7017)	- Basic algorithms - Time and space efficiency - Interacting and interfacing

3. SAMPLE QUESTIONS

a. DUCHESS

i. Training Syllabus

- Drag-and-drop coding: based on visual components such as tiles or icons that are manipulated by end users through drag-and-drop interfaces (Wikipedia, 2016, Retrieved from https://en.wikipedia.org/wiki/Drag_and_drop#In_end-user_programming)
- Basic concept of a "program" and flowcharting
- Computational thinking in daily decision-making
- Logic in procedures and action control

ii. Sample Challenge

Dance Mania

You can dance on the floor but can you dance on the screen? Well, you can't :(But… Miku and MacDonald Uncle can!

You will be shown a set of simple dance moves and give the character instructions using drag-and-drop coding to imitate the dance moves. If the set moves are fulfilled, your group will score points. On top of that, if you add more creative elements, bonus points will be given.

Cooking recipe

Apply logical relations in cooking procedures to cook in the least time period.

b. PRINCESS

i. Training Syllabus

- Basic efficiency analysis
- Introduction to text-based coding in C++
- Data Organisation and processing
- Applications of computers and their social and economic implications.
- Problem solution, including algorithm design, programming concepts and logic gates.
- Generic software and the organisation of data.

(MOE & UCLES, 2015)

ii. Sample Challenge

Star Gazing

As an astronomist, Professor Ng was expected to be acquainted with numerous stars and constellations so that he won't be embarrased when his students asked him questions. However, he simply could not remember how many stars are there in every single constellation. Fortunately, he heard that computer could help him do the chores! Will you help him?

In the following three hours, your jobs are:

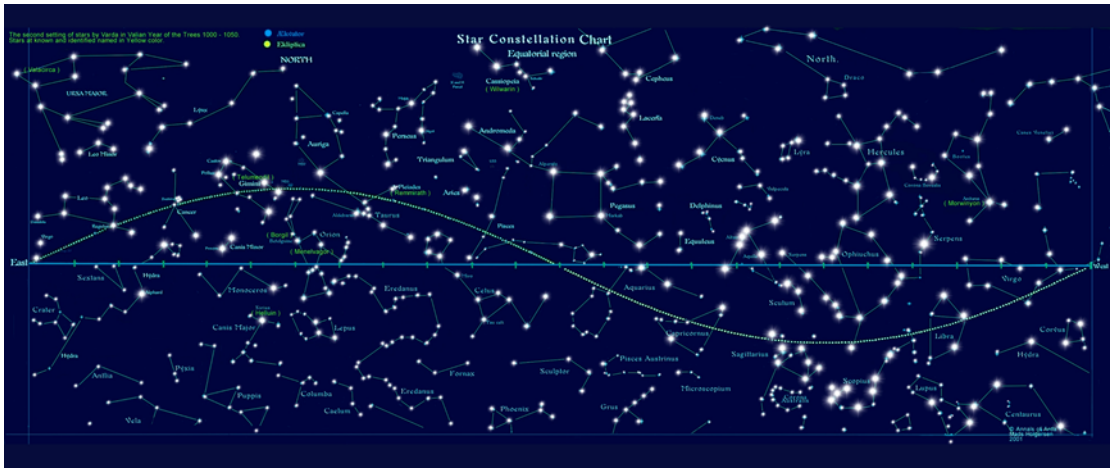
- Store the no of stars and name of the constellations in appropriate data structures
- When the name of the constellation is called, print on the screen the no of stars in that constellation

Sample Input: Hercules

Sample Output: 19

*Optional: Sort the constellations according to the no of stars, in ascending order. In each line of our output, print the name of each constellation followed the no of stars in it.

Scopius 17; Hercules 19



Economics data processing

Data input, organisation, sort, search and extraction

c. QUEEN

i. Training Syqllabus

- Basic algorithms such as sorting and searching, Dynamic programming
- Time and space efficiency and optimization
- Interacting and interfacing
- Advanced data structure
- Deadlock
- Computational modelling

ii. Sample Challenge

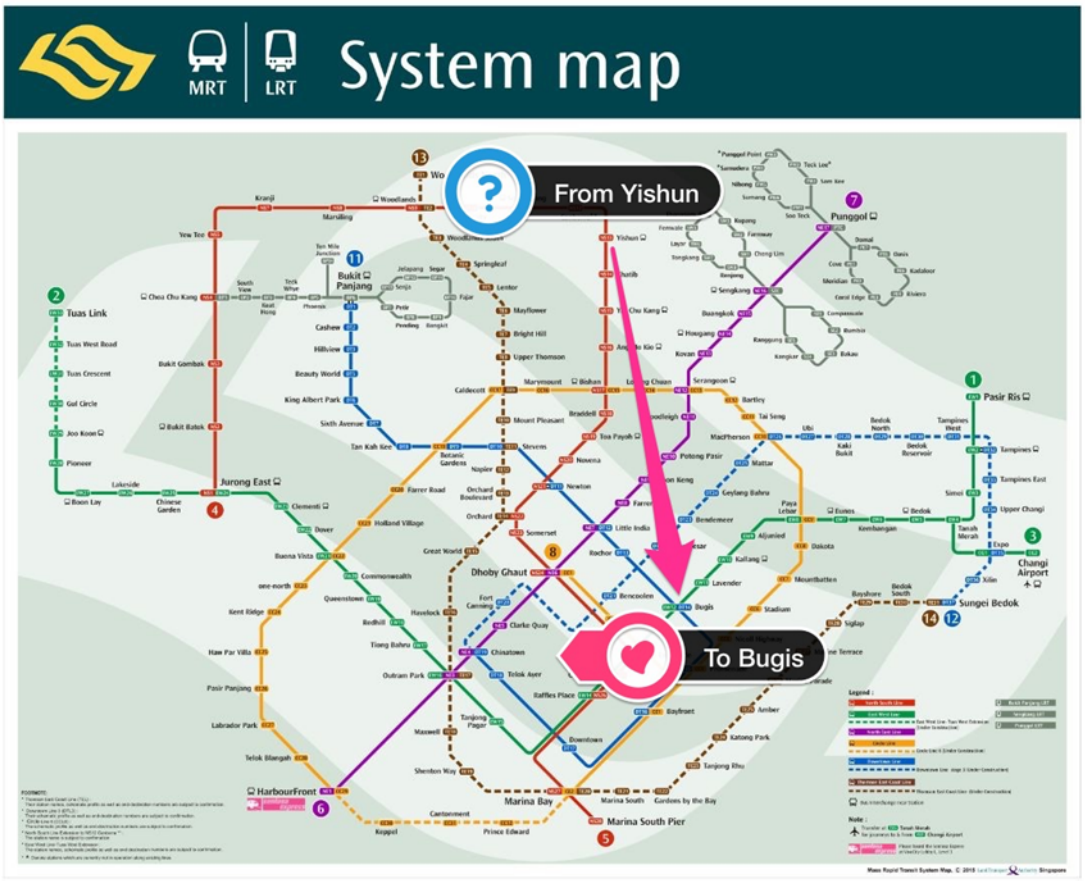
MRT Wizard

Use algorithms to find out the shortest route from one station to another.

Sample Input: Yishun; Bugis

Sample Output: 11

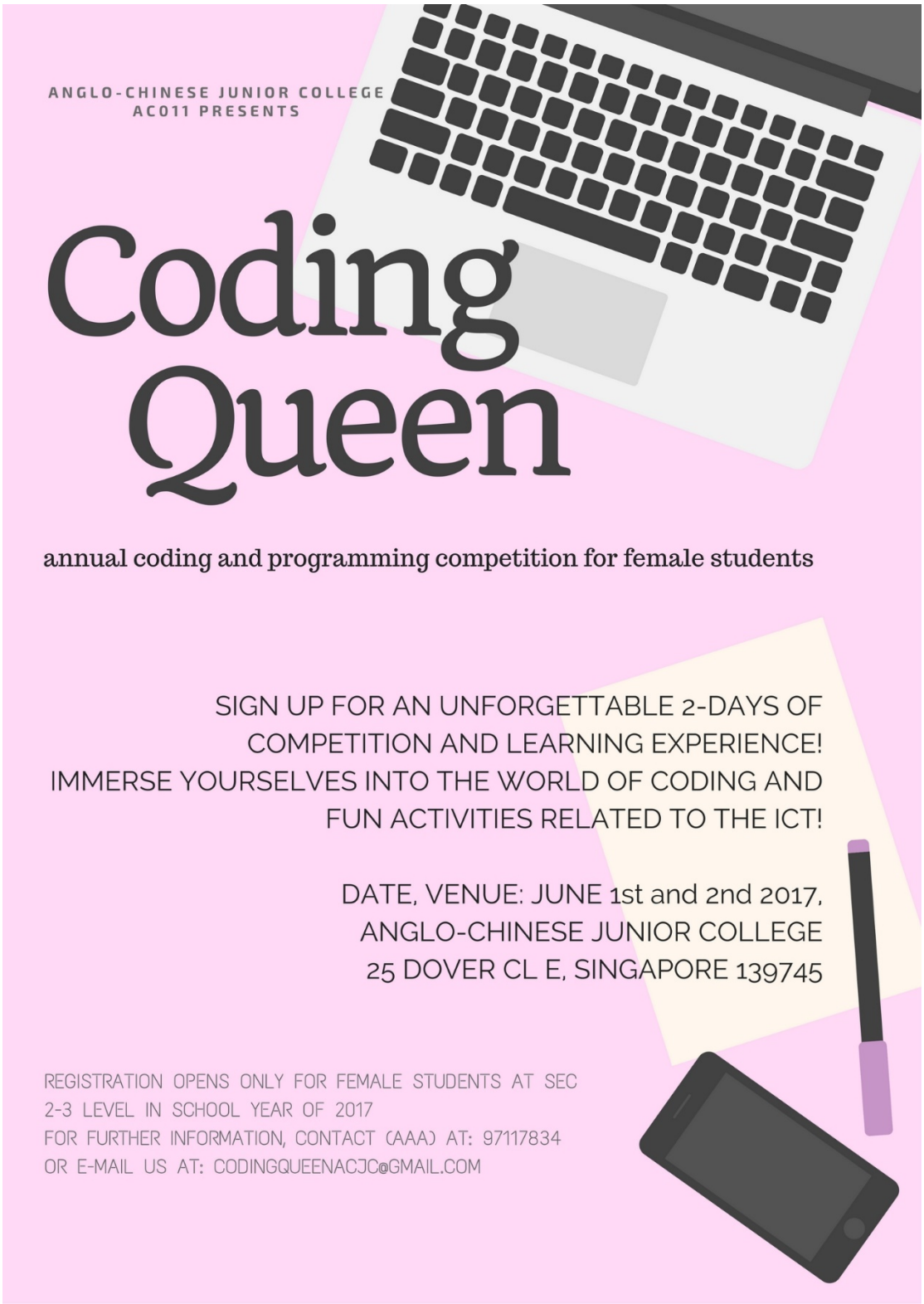
Explanation: From Yishun Station, take the NS line to Newton (8 stations) and change to DT line to Bugis (3 stations). Total = 8 + 3 = 11 stations.



<u>Independent modelling and visualization</u>

Choose a specific subject (e.g. Math, biology, chemistry, language, or history) and an issue within that field, apply ICT in any creative ways they can think of

4. “CODING QUEEN” CHALLENGE POSTER



5. E-MAIL CORRESPONDENCE WITH TEACHER-IN-CHARGE OF ACJC'S SCIENCE AND MATHS COUNCIL (SMC)

Request for Assessment of Manageability of Project Work Plan

Immanuela Asa <asa.immanuela@gmail.com> 7:55 PM (16 hours ago)
to fabiola_lip_ys, Corrine, Sek

Dear Mrs Soong,

I am Immanuela Asa, group leader of Project Work group AC 011. My group is working on a topic related to STEM. Our project aims to expand ICT education for female students in secondary school level.

As part of the project, we are doing a project plan that is similar to the competitions/ events that SMC has been doing. One of our plans, a competition named "Coding Queen Challenge", involves external parties such as participants from secondary schools as well as judges/ adjudicators.

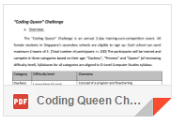
Due to the time and manpower constraints, we are unable to test out all of our project plans. Hence, we would like to request a written statement from you as the teacher-in-charge of SMC, that the plan is within the means of my PW group (as well as the student volunteers) and can be operationalised. This is as our group models SMC which has demonstrated the capacity to hold such large-scale events.

Attached with this e-mail is the details of the "Coding Queen Challenge" project plan as well as the sample poster for publication purposes.

We are truly grateful for your assistance and/ or suggestions for our team. Thank you.

Best regards,
Immanuela Asa
(Group Leader of AC 011)

2 Attachments



Request for Assessment of Manageability of Project Work Plan Inbox x

Immanuela Asa Dear Mrs Soong, I am Immanuela Asa, group leader of Project Work group AC 011... Sep 6 (3 days ago)

Fabiola Lip Yoke Suet Sep 8 (1 day ago)
to me, Corrine, Sek

Dear Immanuela

I'll be able to happy to help your group.

But I will only be able to read your files over this weekend, and revert by Sun evening.

Is the timing good for your schedule?

Rgds
Mrs Soong

asa.immanuela@gmail.com Sep 8 (1 day ago)
to Fabiola, Corrine, Sek

Sure, Mrs Soong. We are okay with that. Thank you for your help!

Immanuela Asa

Sent from my iPhone

Fabiola Lip Yoke Suet Sep 12 (6 days ago)
to me, Corrine, Sek

Dear Immanuela

Your project is workable.

Do let me know if you need further assistance.

Rgds
Mrs Soong

ANNEX E: Teens, Social Media & Technology Overview 2015

(TAKEN FROM: http://www.pewinternet.org/2015/04/09/teens-social-media-technology-2015/)