Our Practice in Using SOP

CHAN PT

Introduction

Responsible for Subject Selection and Allocation with the use of SOP since 2009

SOP is a very helpful and flexible tool for elective subject allocation

Sharing about our School Practice (to learn from each other)

Overview

1. Senior Secondary (SS) Curriculum of our school

2. Workflow of Elective Subjects Selection & Allocation of our school

3. Tips for subject allocation:
   ◦ How to create a better time block structure?
   ◦ How to fine-tune the time block structure?

1) An overview of our SS Curriculum

	Class A / Class B	Class C / Class D
Core Subjects	Chin, Eng, Math & CS#	Chin, Eng, Math & CS
Elective Subjects*	3 or 4	3 or 4
Math. Module	-	M1 (Class C) M2 (Class D)

M1 & M2 Manually allocated

* The 4th elective subject is Music (after school) or Japanese (Saturday)
# CS - Citizenship and Social Development

- Total no. of elective subject offered: 11-12
- 3 Time Blocks structure
- 2-3 groups for some popular elective subjects

Elective subject allocation

Collection of student option forms 3 times (2 trials + 1 final)

Students need to indicate their preferences (1st to 11th) for each elective subject (without knowing the elective subject combinations in different time blocks)

Overall average mark → Allocation Order

Group size (max) = 36 - 40

Final option form

→ Generate Time Block Structure

→ Fine-tune the time block structure

→ Allocate elective subjects

- Alternatively, school may collect student options 2 times to design the time block and allocate elective subjects based on the finalised options

2) Workflow of Elective Subjects Selection & Allocation
of our school

Schedule of Elective Subjects Selection & Allocation

Month	Event
Nov	Subject selection talk for parents and students
Dec	Students submit 1st option form on Subject Selection
Feb	Use SOP to generate block structure and allocate subjects (trial)
Mar	Student submit 2nd option form on Subject Selection
Apr	Use SOP to generate block structure and allocate subjects (trial)
June	Student submit 3rd (Final) option form on Subject Selection
July	Generation of block structures and subject allocation with SOP

- Early planning for teachers and students
- More preparation time to fine-tune the time blocks and allocation results
- Identify possible problems at early stage

Students' Particular & Academic Results

❑Make sure the academic result is correctly extracted

❑Student's overall average mark will be used **as the allocation order**

❑Adjust the rank for those with the same average mark using the tie-breaker criteria (e.g. Chin+Eng+Math mark)
[Preparation➔Student Particulars]

Student Name	Average	Chin. + Eng. + Math.	Rank (average)	Rank (Adjusted)
Student 1	92.94	565	14	14
Student 2	92.94	549	14	15

Elective Subject Selection Survey

Preference for Elective subjects

Key Learning Area	Subject	Subject preference (Please blacken the whole box ■, and choose only one option for each subject)										
		1	2	3	4	5	6	7	8	9	10	11
(A) Personal, Social and Humanities Education	Chinese History	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	Economics	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	Geography	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	History	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
(B) Science Education	Biology	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	Chemistry	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	Physics	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
(C) Technology Education	Business, Accounting and Financial Studies	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	Information and Communication Technology	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
(D) Arts Education	Music (To be conducted once a week outside school hours.)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	Visual Arts	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

- Students need to indicate their preferences for elective subjects by marking any one of the boxes from no. 1 to 11 for each subject.
- Completed form will be scanned into computer

Student Preferences in Excel format (.xls)

Student Number	CHIS1	ECON2	GEO2	HIST2	BIO2	CHEM2	PHY2	BAFS2	ICT2	MUSIC	VA2
3A01	9	1	8	6	4	3	2	5	7	10	11
3A02	10	8	5	6	2	1	3	4	9	11	7
3A03	8	3	11	6	2	1	5	4	7	9	10
3A04	5	7	8	6	3	1	2	4	9	11	10
3A05	7	1	6	5	8	3	4	2	9	10	11
3A06	3	4	6	8	7	1	2	5	9	10	11
3A07	9	5	7	8	4	1	2	3	6	11	10
3A08	9	4	10	6	2	1	3	5	8	7	11
3A09	6	5	7	8	1	2	9	3	4	10	11
3A10	5	2	6	7	11	4	3	1	10	8	9
3A11	6	5	7	8	3	2	1	4	10	9	11
3A12	9	6	5	8	2	1	4	7	3	10	11
3A13	4	8	6	3	1	2	5	7	11	10	9
3A14	8	3	9	7	4	1	2	5	6	11	10

MOI:
CHIS1 - Chinese
ECON2 - English

Use correct column name (e.g. ECON2)
Students' preferences – import to SOP [Preference → Student Options]

No. of subject groups to be offered

❑Total number of 1st to 3rd options (at most 40 for one group)

+

Human Resources

→ no. of subject groups to be offered

❑Group size 40 [Time Block → Subject Group Setup]
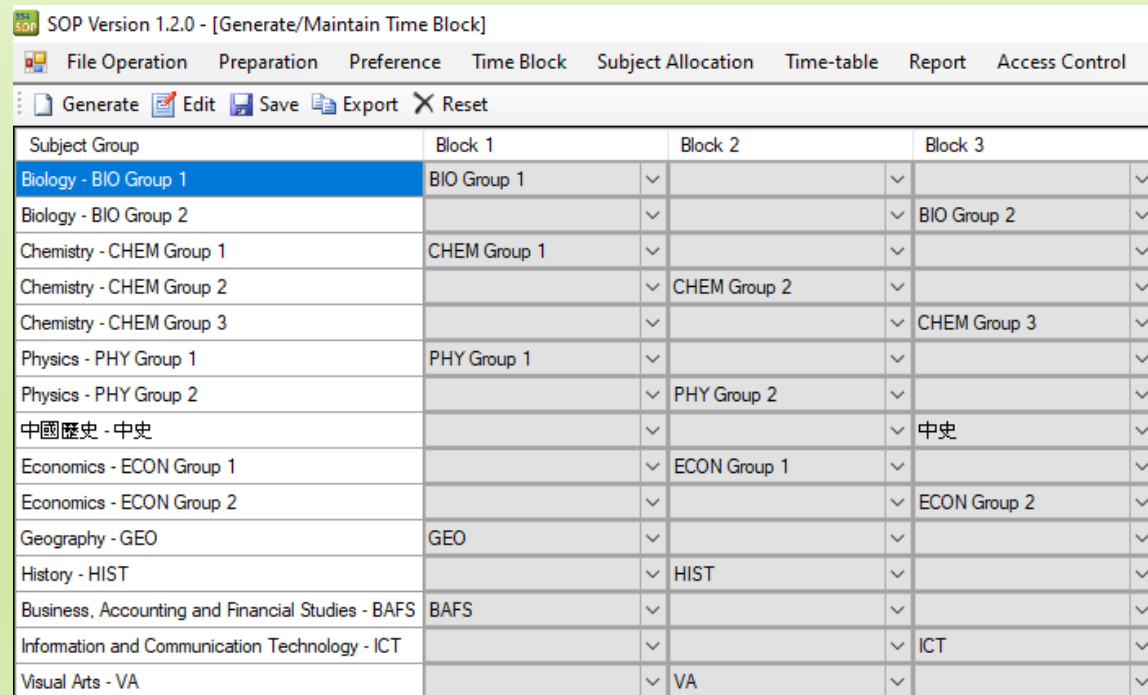
	CHIS	ECON	GEO	HIST	BIO	CHEM	PHY	BAFS	ICT	VA
1st to 3rd options	20	56	10	21	76	101	74	35	19	9
No. of subject groups	1	2	1	1	2	3	2	1	1	1

Music and VA each with 1 group – NO need to use SOP to allocate since not offered within Block 1 - 3

Generating time block structure by SOP

[Time Block → Generate Time Block → Generate]

SOP will automatically generate Time Block Structure

Elective subject allocation of our school

❑Follow all the rest of the steps to allocate elective subjects to students

❑Allocation Algorithm Choices – Choice 3 (all the choices of each student would be allocated in one iteration)
[Subject Allocation → Allocate Subjects]

Remarks:

Most students of our school are allocated to their 1st and 2nd options even though Choice 3 is adopted as we offer plenty of places for each elective subject. Schools may adopt the suitable algorithm choice based on their school contexts and resources to cater for the learning needs of the less-able students.

❑If you want to check if the satisfaction rate can be further increased, you may check if fine-tuning the block structure can help.

❑The following is my suggested way:

3) Tips for subject allocation:
   How to create a better Time Block Structure?

Run	Block arrangement			Assigned							Remarks
				1	2	3	4	5	6	7	
#1	Block 1	Block 2	Block 3	133	130	113	15	1	3	3	SOP generated block structure
	CHEM	CHEM	CHEM								
	BIO	PHY	BIO								
	PHY	ECON	ECON								
	HIST	GEO	中史								
	BAFS	ICT									

After checking the allocation report, it is found that some students have subject clashed within the same block. So only one of the subject is allocated.

Option 01	Option 02	Option 03	Option 04	Option 05
ECON	PHY	BAFS	ICT	CHEM
BAFS	ECON	HIST	中史	GEO

How to create a better Time Block Structure? (Cont)

Time Block → Conflict Matrix Enquiry

Subject	BIO	CHEM	PHY	中史	ECON	GEO	HIST	BAFS	ICT
BIO	NA	54	35	1	15	1	7	7	2
CHEM	54	NA	72	1	39	1	4	22	7
PHY	35	72	NA	4	26	2	7	17	5
中史	1	1	4	NA	5	2	7	3	1
ECON	15	39	26	5	NA	4	12	18	2
GEO	1	1	2	2	4	NA	4	2	0
HIST	7	4	7	7	12	4	NA	5	2
BAFS	7	22	17	3	18	2	5	NA	1
ICT	2	7	5	1	2	0	2	1	NA

	GEO	GEO	GEO	GEO	BAFS	BAFS	BAFS	HIST	HIST	中史
	BAFS	HIST	中史	ICT	HIST	中史	ICT	中史	ICT	ICT
No. of students with both subj as 1st & 2nd electives	2	4	2	0	5	3	1	7	2	1

How to create a better Time Block Structure? (Cont)

Comparison of "Scores" for each pair of elective subjects

Run	Block arrangement			Assigned							Remarks
				1	2	3	4	5	6	7	
#1	Block 1	Block 2	Block 3	133	130	113	15	1	3	3	SOP generated block structure
	CHEM	CHEM	CHEM								
	BIO	PHY	BIO								
	PHY	ECON	ECON								
	HIST	GEO	中史								
	BAFS	ICT									

	GEO	GEO	GEO	GEO	BAFS	BAFS	BAFS	HIST	HIST	中史
	BAFS	HIST	中史	ICT	HIST	中史	ICT	中史	ICT	ICT
No. of students with both subj as 1st & 2nd electives	2	4	2	0	5	3	1	7	2	1

Run	1st Block	2nd Block	3rd Block	Sum of no. of students with both subj as 1st and 2nd electives
#1	HIST + BAFS	GEO+ICT	中史	5+0 = 5

- Alternatively, schools may swap elective subjects in different time blocks and compare the satisfaction rate to adopt the better time block

Tips for subject allocation:
How to fine-tune the time block structure?

Minor adjustment to the time block structure can be done by referring to the conflict matrix

	GEO	GEO	GEO	GEO	BAFS	BAFS	BAFS	HIST	HIST	中史
	BAFS	HIST	中史	ICT	HIST	中史	ICT	中史	ICT	ICT
No. of students with both subj as 1st & 2nd electives	2	4	2	0	5	3	1	7	2	1

Block 1	Block 2	Block 3
CHEM	CHEM	CHEM
BIO	PHY	BIO
PHY	ECON	ECON
HIST	GEO	中史
BAFS	ICT	
5	0	-

BAFS → B3 →

Block 1	Block 2	Block 3
CHEM	CHEM	CHEM
BIO	PHY	BIO
PHY	ECON	ECON
HIST	GEO	中史
	ICT	BAFS
	0	3

Allocate elective subjects for each block structure and adopt the one with the better satisfaction rate

Block 1	Block 2	Block 3
CHEM	CHEM	CHEM
BIO	PHY	BIO
PHY	ECON	ECON
HIST	GEO	中史
	BAFS	ICT
	2	1

ICT ←→ BAFS

How to create better structure?

	GEO	GEO	GEO	GEO	BAFS	BAFS	BAFS	HIST	HIST	中史
	BAFS	HIST	中史	ICT	HIST	中史	ICT	中史	ICT	ICT
No. of students with both subj as 1st & 2nd electives	2	4	2	0	5	3	1	7	2	1

Run	1st Block	2nd Block	3rd Block	Sum of no. of students with both subj as 1st and 2nd electives
1	HIST + BAFS	GEO+ICT	中史	5+0 = 5
2	中史+ ICT	HIST	GEO + BAFS	1+2 = 3 (chosen)
3	中史+ ICT	GEO	HIST + BAFS	1+5 = 6
4	中史+ ICT	BAFS	GEO + HIST	1+4 = 5
5	GEO+ICT	HIST	BAFS+中史	0+3 = 3
6	GEO+ICT	中史	BAFS+HIST	0+5=5
7	GEO+ICT	BAFS	HIST+中史	0+7=7
8	BAFS+ICT	HIST	中史+GEO	1+2=3
9	BAFS+ICT	中史	HIST+GEO	1+4=5
10	BAFS+ICT	GEO	中史+HIST	1+7=8

Combination with the lowest score is preferred

#2 is chosen since it has the lowest score (sum is 3). Although #5 and #8 also have the lowest score, not all possibilities are tried due to time constraint.

Try all possible structures with the grouping chosen

Put the subjects with one group in different blocks, allocate subjects and check the satisfaction rate

Adopt the one with the highest satisfaction rate

Run	1st Block	2nd Block	3rd Block	
Fixed subjects	CHEM PHY BIO	CHEM PHY ECON	CHEM ECON BIO	
	中史+ ICT	HIST	GEO + BAFS	
	中史+ ICT	GEO + BAFS	HIST	
	HIST	中史+ ICT	GEO + BAFS	
	HIST	GEO + BAFS	中史+ ICT	
	GEO + BAFS	中史+ ICT	HIST	
	GEO + BAFS	HIST	中史+ ICT	This structure produces the highest satisfaction rate.

The satisfaction rate could be raised by trying different combinations and swapping elective subjects in different time blocks (e.g. 90.3% ➔ 95%).

Other Tips

Create a simple procedure manual to allocate elective subjects for easy reference

Procedures on using SOP	
1	- Get file from Office save as StudentParticularReport.xls (file1) ** Required fields : Student Number, Student Name, Gender, Class, Class Number, Next Year Class, Num of Electives, Average, Rank - Import file: StudentParticularReport.xls (file1) - Preparation → Student Particular → Import from file (file1) ** better remove withdrawn (repeater) students from file1 before import since ranking should be ranked again to exclude withdrawn students. If there is withdrawn after import, can remove student who has withdrawn from school manually from Preparation → Student Particular → Delete

Other Tips

➢Good Subject allocation = High Satisfaction Rate ?

Run	Satisfaction Rate	Assigned							Remarks
		1	2	3	4	5	6	7	
1	93.3%	100	100	80	10	10			Most preferred
2	93.3%	80	100	100	10	10			
3	93.3%	80	100	100	0	0	10	10	Least preferred

➢Elective subjects selection and allocation more than once within the school year (trial and error)

→ help school to better plan for teaching assignment and
→ motivate subject teachers to promote their subjects
→ encourage students to reflect on their choices and make early preparation

➢Check the allocated subjects against the hardcopy forms filled by students

Summary

❑SOP can help to flexibly allocate elective subjects

❑Elective subjects selection and allocation more than once within the school year – identity problem earlier

❑Fine-tune the time block structure if necessary

❑Produce procedure manual for easy reference

❑Checking of student's academic results + option forms to ensure data accuracy