

Informatic Curriculum in Indonesia
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I. National Standard Framework

Indonesia structure of Education has 6-years for Primary School, 3-years for Junior High School, and 3-years for Senior High School. Books that used in schools were some developed by the government and some books were developed private publisher. At the end of each school year, an assessment of student learning outcomes is carried out by school to determine whether the student move to higher grade/level or remain at the same grade/level. At the end of grades 6, 9 and 12, the assessment of student learning outcomes certain subject is carried out by school and certain subjects are carried out as national examination by government. Generally, curriculum framework changes are carried out in a 10-year period. Changes in the current curriculum relate to the presence of informatics subjects in high schools as elective subjects. The selection to carry out informatics subjects is carried out by the school on the basis of student needs, the availability of facilities/ infrastructure to support teaching-learning, and teacher education background. Schools that do not choose Informatics subjects remain to implement ICT School Program.

II. Curriculum Sequence from Primary to Secondary on Informatics

Level	Grade	ICT	CT	CE	NW	DA	AP	Soc	CP	
Primary School	I	√	√	√	-	-	-	-	√	ICT: Inf Comm Tech
	II	√	√	√	-	-	-	-	√	CT: Comp Thinking
	III	√	√	√	√	√	√	√	√	CE: Computer Engineering
	IV	√	√	√	-	√	√	√	√	NW: Network and Internet
	V	√	√	√	-	√	√	√	√	DA: Data Analysis
	VI	√	√	√	-	√	√	√	√	AP: Algorithm and Prog
JHS	VII	-	√	√	-	√	√	√	√	Soc: Social impact
	VIII	-	√	-	√	-	√	√	√	CP: Computing Practice
	IX	√	√	√	-	√	√	√	√	

III. High School Curriculum on Informatics

Level	Grade	ICT	CT	CE	NW	DA	AP	Soc	CP
SHS	X	√	√	√	√	√	√	√	√
	XI	-	√	√	√	√	√	√	√
	XII	-	√	-	-	-	√	√	√

Regarding the three pillars of Computational Thinking in the Curriculum

Schools in Indonesia teach Informatics as an elective subject. The content strand is as shown in the table below.

The Three pillars of Computational Thinking	Content Strand in the Curriculum
Programming	Computer Engineering
Modeling	Computer network and Internet
Machine Learning	Analysis data
	Algorithm and programming
	Social impact informatics
	ICT
	Computing practices
	Computational thinking

Comment:

The proposed computational thinking is very computer minded, how is the idea computational thinking as a process to solve complex problem with the component such as introduced by Google: decomposition, pattern recognition, pattern generalization and abstraction, and algorithm design and or programming.

IV. Challenges and Next Steps /Vision

a. Current Challenges

Support system for teachers so that they can conduct teaching learning process as state in the curriculum:

- Training model
- Tutoring model from University
- Provide suitable content in the repository
- To increase teachers/school who teach Informatics

b. Next Step/ Vision for Reform

- Informatics for Primary school
- Policy how to provide enough number appropriate teachers
- Provide enough informatics learning material in Indonesia language.

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II. Curriculum Sequence from Primary to Secondary on Statistics

Curriculum sequence for PS on Statistics	Curriculum sequence for LS on Statistics
Grade V 3.7 Explaining data and how is it collected 3.8 Organizing and presenting of data in the form of lists, tables, image pictograms, bar charts, or line diagrams Grade VI 3.8 Explaining and comparing the mode, median, and mean using it to solve the problems	Grade VII 3.12 Presenting, analyzing, and interpreting the relationship between sets of data in tables, line diagrams, bar charts, and pie charts Grade VIII 3.10 Presenting, Analyzing, and solving problems dealing with mean, median, mode, and data distribution to draw conclusions, make decisions, and make predictions 3.11 Empirical and theoretical probability of an event and/or an experiment and using it

III. High School Curriculum on Informatics

Grade	Content of Statistics
XII(General)	3.2 Central tendencies measures and dispersion measures of data presented in the form of frequency distribution tables and histograms 3.3 Combinatorial Methods (addition rule, multiplication rule, permutation, and combination) and using them to solve problems
XII (Majoring Math and Natural Sciences)	3.5 Binomial probability distribution and using it to make conclusions 3.6 Characteristics of Normal distribution and using it to make conclusions

Regarding the five phases statistical thinking in Indonesia Curriculum:

The five phases	Prescription in the Curriculum
1. Pattern and relationship	<ul style="list-style-type: none">• Observing
2. Questions	<ul style="list-style-type: none">• Questioning
3. Objectives	<ul style="list-style-type: none">• Collecting data/information
4. Data Mining	<ul style="list-style-type: none">• Associating/constructing
5. Understanding and/or designing	<ul style="list-style-type: none">• Communicating

Statistical thinking skill (Indonesia case) needs to give strengthening dealing with:

- Missing data
- Extreme Data and outlier
- Data error
- Integrating data from different sources
- Using computer technology
- Organizing or transforming unstructured data
- variation
- giving a chance to students to implement their statistical knowledge/skill to find real data in their real life and getting something useful from the data.

Proposing:

Model for Problem Solving

“big picture with incomplete detail for some parts”,

Because:

- ▶ some part beyond of their learning object but they need to know “the story” to help them to imagine dealing with real big data.
- ▶ make statistical thinking in digital era for Senior High School more meaningful learning,

IV. Challenges and Next Steps/ Vision

a. Current Challenges

Many statistics tools now available for free, we need to empower Mathematics teachers to use it.

b. Next Step/ Vision for Reform

- Introduce the new content and approach of statistical thinking
- Proposing small scale project relate to new content and approach of statistical thinking

