





§ Data of TIM Dilemma betwe Confidence of M	SS-2003 Pres en Students' Achi lathematics (TIMS	sents A Dilemn levement and Self- SS-2003)	na
Achievement	High	Low	
Self-Confidence		Malaysia, Australia,	
High		U.S., Indonesia,	
		Chile, Philippines	
	Singapore, Korea,		
Low	Hong Kong,		
	Japan, Taiwan		
			•
	APEC-TSUKUBA Internation Conference	nal	4

elf-Confid	ence in Le	earning Ma	th-Grade	4 (TIMSS 2	2003):
High	SCM	Mediu	m SCM	Low	SCM
% of students	Avg. Achieve ment	% of students	Avg. Achieve ment	% of students	Avg. Achieve ment
49	629	35	573	16	540
40	601	42	562	19	548
39	600	40	550	21	532
41	591	39	549	20	539
55	522	33	472	11	453
	elf-Confid High % of students 49 40 39 41 55	elf-Confidence in Le High SCM % of students Avg. Achieve ment 49 629 40 601 39 600 41 591 55 522	elf-Confidence in Learning MaHigh SCMMediu% of studentsÅvg. Achieve ment% of students49629354060142396004041591395552233	High SCMMedium SCM% of studentsAvg. Achieve ment% of studentsAvg. Achieve ment49629355734060142562396004055041591395495552233472	elf-Confidence in Learning Math-Grade 4 (TIMSS 2High SCMMedium SCMLow% of studentsÅvg. Achieve ment% of students% of students496293557316406014256219396004055021415913954920555223347211

	High	SCM	Mediu	m SCM	Low	SCM
Countries	% of students	Avg. Achieve ment	% of students	Avg. Achieve ment	% of students	Avg. Achieve ment
U.S.	64	541	25	486	11	475
Australia	64	522	25	471	11	436
Philippines	34	395	53	351	12	326
International Avg.	55	522	33	472	11	453

	High	SCM	Mediu	m SCM	Low	SCM
Countries	% of students	Avg. Achieve ment	% of students	Avg. Achieve ment	% of students	Avg. Achieve ment
Singapore	39	639	34	594	27	571
Korea	30	650	36	592	34	534
Hong Kong	30	627	38	581	33	556
Taiwan	26	661	30	593	44	534
Japan	17	634	38	580	45	538
International Avg.	40	504	38	453	22	433

	High	SCM	Mediu	m SCM	Low	SCM
Countries	% of students	Avg. Achieve ment	% of students	Avg. Achieve ment	% of students	Avg. Achieve ment
Malaysia	39	546	45	490	16	471
Australia	50	542	31	483	19	451
U.S.	51	534	29	483	20	461
Indonesia	27	420	59	408	15	416
Chile	35	427	42	369	23	361
Philippines	29	405	59	369	12	366
International Avg.	40	504	38	453	22	433





























Thinking	Primitive image	Specializing	Classifying	Generalizing	Abstracting	Adapting	Formalizing	Extrapolating
0	\vee							
1		\vee						
2		\vee						
3		\vee	\vee					
4			\vee					
5-1				\vee	\vee			
5-2				V	\vee			
6						\vee		
7				V	\vee		\vee	
8				V	\vee			\sim

Metacognition	Awareness	Evaluation	Self-regulation
0	V		
1	V		
2	V		
3	V	V	
4		V	
5-1		V	
5-2		V	
6		V	
7			V
8			V























2. A Frame fo	r Designing Conjecturing (FD	C)
Starting	Learning Strategy/Process	
•False Statement	➢Proceduralized refutation learning model	
•True Statement	➤A thinking triad	
	"What if not" strategy to improve problem posing (Brown & Walter, 1983)	
	Specialization/Generalization (Polya, 1962; Mason, Burton, &Stacey, 1985)	
	≻Analogous	
	Re-modification: modify-remodify till one makes sense of it	
•Conjecture	≻Defining	
	➤Exploration	
	Constructing Premise/Conclusion	
	APEC-TSUKUBA International 36 Conference	6











Conference

APEC-TSUKUBA International

41





















	Mathematics Conjecturing Task
	Class No. Name
	School Grade Gender ()Male ()Female
Appendix:	Statement A: The multiples of 3 and the multiples of 6 are the multiples of 9. Is the statement correct? Please describe your points.
	My answer :correctincorrectuncertain
	My reason :
	Mathematics Conjecturing Task
	Class No. Name
	School Grade Gender ()Male ()Female
	1. Please provide an example for the statement A.
	1.
	2. Please provide some more examples for the statement A.
	2.
	3.
	4.
	5.

- 10		
	 Please provide even more kinds of examples till you cannot think of any other kind of examples. 	
	a.	
	b.	
	с.	
	d.	
	4. From the example you provided in Q2 and Q3, distinguish which examples support the statement A, and which ones reject. Please list numbers/letters as support or rejection.	
	5-1 What are the common properties among the supporting examples	?
	5-2 What are the common properties in the rejected examples?	

	6. Reconsider the statement A.	
	Do you think the statement is correct or incorrect?	
	□correct □incorrect □uncertain	
	My reasons or proof	52
		53
		1

Correct sta	tement:
. Please do believe to	your best to give more statements similar to A that you be correct
1.	
2.	
3.	
3. 4.	
3. 4. 5.	

