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### Research Article

# Effects Of Cognitive And Metacognitive Strategies On Student Academic Achievement In Ten Countries: Systematic Literature Reviews

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### **Abstract**

The Existence Of Different Studies On The Relationship Between Learning Strategies And Academic Achievement Shows A Positive Influence And Has An Efficient Strategy On The Learning Process. This Study Was Conducted Using A Systematic Survey Method, And Also Aims To Investigate The Impact Of Cognitive And Metacognitive Strategies On Student Academic Achievement In Ten Countries Including Malaysia. The Focus Is On The Review Of Articles That Have Been Published In Ten Countries From 2007 To 2021. Research Data Shows That, Learning Strategies Such As Cognitive And Metacognitive Strategies Have Had A Very Significant Impact On The Academic Achievement Of School And University Students In Courses That Different. In General, It Can Be Said That Cognitive And Metacognitive Learning Strategies That Include Research Methodologies Such As Experimental, Quasi-Experimental, Relationship Or Correlation, Questionnaires And Even Meta-Analysis Covering Both Genders Of Students (Women And Men) Are Very Effective To Their Learning In Different Courses (Experimental Science, Mathematics, Tourism, Nursing, Psychology, Foreign Languages And English).

**Keywords:** Systematic Review, Learning Strategies, Cognitive And Metacognitive Strategies, Academic Achievement

## 1. Introduction

Human Achievement In All Areas Of Science Has Increased The Importance Of Learning Strategy Training. The Main Thing In Training Is That Students Are Taught How To Learn, How To Memorize, And Problem -Solving Techniques. Students Should Know The Most Effective Learning Methods And Strategies. Researchers Concluded In Their Study That Most Of The Learning Problems Faced By Students Are Due To Lack Of Study Skills. Learning Strategies Include Cognitive And Metacognitive Strategies That Can Help Students To Achieve Their Desires In Learning. Oxford Defines A Learning Strategy As A Set Of Specific Activities Performed By Students To Be Easier, Faster, More Enjoyable, More Effective, And More Convenient According To A Particular Situation. The Application Of Cognitive And Metacognitive Strategies Is Very Important In Facilitating Learning, The Process Of Remembering, And Memorizing. Cognitive And Metacognitive Strategies Have The Strongest Impact On Student Learning, And There Is A Positive And Significant Relationship Between Learning Methods And Academic Achievement In Universities And Schools (Saied And Mehrabi, 2013; Yang, 2005).

Flavell (2000) Considers Metacognition As A Type Of Knowledge Or Cognitive Knowledge That Involves Aspects Of Cognitive Measurement And How To Organize It. In Other Words, He Believes That This Is A Concept Of Metacognition Because Its Primary Meaning Refers To The Reintroduction Of Cognition. Thus Cognition Refers To The Perception, Processing, Retention, And Transfer Of Information While Metacognition Is An Activity That Encompasses Actions Related To The Four Elements And Controls Mentioned Earlier (Aghazadeh, 2011). Based On Studies That Have Been Done Showing That Metacognition Is Related To Learning,

Learning Practically, Thinking Critically, Problem Solving And Decision Making, All These Efforts Are Required To Achieve Success In Education (Scheifer And Dull, 2009). While Conducting Research, Different Learning And Thinking Methods Or Cognitive And Metacognitive Indicate That These Strategies Can Be Learned, I.E. Teachers Can Use Them Extensively In Different Courses. Teachers Teach These Learning Strategies To Their Students And After That Students Can Use These Strategies Voluntarily And Can Measure Themselves The Positive Effects On Their Learning And Achievement (Saif, 1997)

Weinstein And Hume (1998) As Taken From Saif (1997) Have Stated That Teachers Can Help Their Students Through Teaching, Learning And Learning Skills (Cognitive And Metacognitive Strategies) So That Students Are More Successful And Have A More Active Role In Achieving Their Academic Wealth. Flavell (1979) As Taken By Saif (1997) Who Has Delved Into Cognitive And Metacognitive Strategies, States That Students Apply All Cognitive Strategies To Achieve Their Success And Use Metacognitive Strategies To Control Their Success And Achievement. In Addition, Other Studies Show That There Is A Relationship Between Learning Strategies And Academic Achievement (Karami, 2002). By Training Cognitive And Metacognitive Strategies, Helps Improve Students 'Learning And Increases Their Motivational Confidence In One's Training And Helps Their Academic Achievement. (Beckman, 2002). Shouse, Chen And Hsieh (2007) Emphasize The Importance Of Providing An Education System That Is Appropriate To The Learning Methods Of Students In Schools. If The Educational Materials Suit The Cognitive Style Of The Students, They Will Improve Their Achievement And Better Motivation. Other Studies Have Shown That Using Cognitive Learning Strategies Can Have An Impact On Students 'Learning And Academic Achievement (Meec, 1998).

Training Learning Strategies Can Have A Positive Impact On Academic Achievement (Fardi Yazdi, 2005). The Issue Of Inability To Acquire And Learn Properly, Has Attracted The Attention Of Several Educational Researchers As Well As Experts And Researchers In Recent Years For The School And University Levels. Therefore, To Achieve The Stated Objectives, A Better Understanding Of The Problems That Can Be Learned Is Considered As One Of The Important Educational Objectives And Activities. Therefore, This Study Seeks To Examine The Cognitive Effects And Metacognitive Strategies On The Academic Achievement Of School And University Students Through More Systematic Past Studies.

## 2. Methodology

This Research Method Uses Various Research Highlights Included In The Literature Research. The Population In This Study Is A Study Related To The Effects Of Cognitive And Metacognitive Strategies On Academic Achievement In Iran And Abroad. The Article Review Period Is From 2007 To 2021. Thus, The Population Includes All Articles Published In Research Journals Indexed In The Sid, Irandoc, Magiran, And Noormags Databases In Iran, As Well As Internationally Published Journals Indexed In The Database Science Direct, Elsevier, Google Scholar Such As American Psychology, Pythagoras Journal, Instructional Pedagogy Journal. This Journal Uses Different Correlations, Factor-Comparisons, Methods And Designs Of Experimental And Quasi-Experimental Research To Investigate The Effects Of Cognitive And Metacognitive Learning Strategies On Indicators Of Academic Achievement. For Primary Investigations, Valid First Keywords Were Determined Based On A Review Of The Literature For Their Use In Locating Primary Studies. Keywords Include Learning Strategies, Cognitive And Metacognitive Strategies, Self-Directed Learning, Academic Achievement, Learning Strategies, Academic Success And Others.

## 3. Findings

The Objective Of This Study Was To Examine The Effects Of Cognitive And Metacognitive Strategies On The Academic Achievement Of Students In Other Countries By Using A Literature Review. Tables 1 And 2 Show The Results Obtained From Different Articles On The Effects Of Cognitive And Metacognitive Strategies On Student Academic Achievement. In This Table Contains The Name Of The Author And Year Of Publication, The Country Or City Where Each Study Was Conducted, Research Methods And Design, Population, And Finally State The Results Of The Study Conducted.

N	Authors	City	Research	Methodolog	Populatio	Findings
О				у	n	
	Authors  Napapat Thongwichit , Adcharawan Buripakdib  2021	City  Songkla Universit ythailand	Research		-	This Study Aimed To Explore The Instructional Effectiveness Of Metacognitive Reading Strategies Through Modeling Techniques Of Student Reading Comprehension In The Context Of Esp. A Pre- And Post -Test Study Group Was Conducted With An Experimental Group Of Students Taking An English For Tourism Course. The Results Showed That The Post -Student Test Score Was Much Higher Than Their Pre -Test Scores After Receiving His Treatment (P <0.05). These Results Are Supported By Data From Student Learning Logs Stating That There Is Continuous Progress In Reading For Students Using Metacognitive Strategies. In Addition, Students 'Perceptions Reflected Positive Outcomes On The Use Of Metacognitive Strategies When Reading. In Conclusion, Studies Suggest That Metacognitive Reading Strategies Should Integrated, Not Only In English Reading Classes, But Also In Other Classes That Have Involvement In
						Reading Activities To Improve Students 'Mastery Of Reading With Strategies Which Improves Their Reading Comprehension
2.	Cecilia Guanfang Zhaoa, Linyu Liao 2021	Taipa, Macau, China.	Premear	Survey	200 Efl Students	Reading Comprehension.  Empirical Data Factor Analysis Indicates The Main Types Of Strategies Used By Efl Authors Include Time Trial Arrangements. Correlation And Regression Analyzes, However, Showed Limited And Mixed Effects Of The Use Of Such Strategies On Writing Evaluation Performance. The Results Of This Study Require The Treatment And Measurement Of The Use Of More Detailed And Sophisticated Metacognitive Strategies In Future Research, Especially In The Initial Planning Of Instruments, Tests And Effects. Such New Evidence Could Provide

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						Writing Pedagogical Information,
						Especially In The Face Of The Need
						To Integrate Metacognitive Strategy
						Instruction Into L2 Writing Classes.
3.	Mohd Sham	Seremba	Primear	Eksperiment	Form 4	Although The Study Of Reading
	Bin Kamis	n/Malays		al Ancova	Students	Arabic Texts Is Growing In Arabia
		ia			(Smk	And Other Countries, It Is Still
	2017				Agama)	Uncommon In Malaysia. Therefore,
						This Study Focuses On The Use Of
						Arabic Metacognitive Strategies
						(Mcs) Used By Form 4 Students At
						Smk Agama In Seremban. In
						Addition, This Article Aims To
						Study The Effects Of Mcs The Use
						Of Arabic Texts In Arabic
						Comprehension And Vocabulary.
						Based On Stratified Sampling, 60
						Respondents Were Taken From
						Smka In Seremban To Undergo This
						Study. The Group Was Divided Into
						Two Groups, With 30 In The
						Experimental Group And 30 In The
						Control Group. This Study Is A
						Quantitative Research And Is A
						Numerically Based Research Method
						That Uses Ancova Test. In This
						Study, Training Was Given Between
						Pre -Test And Post Test. Finally,
						After A Semi -Experimental Study
						Was Performed, The Findings
						Showed That There Were Significant
						Differences In Arabic Language
						Comprehension And Post -Test
						Arabic Vocabulary Between The
						Experimental Group And The
						1 -
						Control Group. The Experimental
						Group Showed Higher Levels Than
						The Control Group. This Study
						Contributes To The Field Of Arabic
						Education From The Perspective Of
						Comprehension And Vocabulary In
						Mcs Reading Arabic Text.
4.	Ahmad	Indonesi	Primear	Correlation/	30	Based On The Results Of This Study
	Nurul	a		Quantitative	Students	It Can Be Seen That Metacognitive
	Hidayat				(Male)	Learning Strategies Have A
						Correlation Positive And Significant
	2015					With Listening Skills And Reading
						Comprehension To Class Vii
						Students Of Mts Al-Amiriyyah,
						Tegalsari District Banyuwangi
						Regency Academic Year 2013/2014.
	l	l		l	1	

5.	Maroofi Et.	Iran/Sana	Primear	Quasi-	Female	Teaching Using Cognitive And
	Al 2014	ndaj		Eksperiment	Student	Metacognitive Strategies Has Had
				al	Of Fifth	An Impact On The Academic
					Grade Of	Achievement Of Girls In Fifth Grade
					Elementar	Primary School
					y School	
6.	Rasoli	Iran/Tehr	Primear	Path	Ba	Metacognitive Has A Direct Impact
	Khorshidi	an		Analysis	Students	On Cognitive Strategy, Basic
	At. Al.					Strategies, Resource Management
	20014					And Academic Achievement.
						Metacognition Has The Greatest
						Impact On Student Achievement.
7.	Karami Al.	Iran	Primear	Eksperiment	Male	Teaching Using Cognitive And
	2013			al	Student	Metacognitive Strategies Enhances
					Of Grade	Creativity, Motivation, Success, And
					Three Of	Self-Learning Concepts.
					The	
					Second	
					Grade Of	
					Primary	
8.	Salehi At.	Iran	Primear	Correlation	School Nursing	The Results Of The Study Showed
0.	Al.	IIaii	Fillileal	Correlation	Students	That Nursing Students Who Used
	711.				Students	Cognitive Strategies "Mental
	2013					Rapitation And Reheasel ", More
						Semantic Development Than Any
						Other. In Addition, They Use Cases
						Such As Compiling, Thinking
						Critically To Be At A Moderate
						Level For The Process Of Finding
						Information And Studying In The
						Surgical Course.
9.	Eluemuno	Nigeria	Primary	Experimenta	High	The Results Show That Cognitive
	And Azuka			l (Pretest	School	Strategy Training And Metacognitive
	2013			/Posttest)	Students	Has A Positive Effect On
						And Using These Strategies Has
						And Using These Strategies Has Effectiveness In Student Academic
						Achievement Especially Those
						English.
10	Zhang Et Al	China	Primear	Survey/	School	To Learn English As A Second
	2013			Qualitative	Students	Language, Students Use
						Metacognitive Strategies And There
						Are Differences Between Students
						Who Use This Strategy And Those
						That Do Not Use. The First Group
						Have Significant Achievement In
						Their English.
11	Ganji Et Al.	Iran/	Primear	Correlation	Secondary	Using Cognitive And Metacognitive
	2012	Khorram			Female	Strategies Effective On The
		a Bad				Academic Achievement Of Students

12	Taymoir Fard 2021 Peng 2012	Iran China	Primear Primary	Multiple Regression  Experimenta	School Students  Secondary School Students  Male And Female Mb University Student S	Whether Living In Urban Or Rural Areas. Effectiveness In Using This Strategy Shows Urban Students Use Both Strategies.  Iq Is Able To Predict Academic Achievement Has Better Than Metacognition. Moreover, Students With High It Skills Have More Achievement In Academics.  The Results Show That Cognitive Strategy Has The Most Impact On Student Scores. Cognitive Strategies, Self -Study, And Anxiety In Exams Is The Most Important Indicator That Affects Improving English Language
14	Masoud Gholamali Lavasani. 2011	Tehran, Iran	Primear	Eksperiment	Primary School Students	The Purpose Of This Study Was To Examine The Effect Of Self - Regulation Learning Strategy Training On Academic Motivation And Self -Efficacy Of Students. Thus, Twenty -Three Classes Of Primary School Girls Students Were Selected As A Sample. One Of The Classes Was Selected As The Taught Experimental Group Self-Rule Learning Strategies For 10 Sixty-Minute Sessions And The Control Group Received Nothing. At First, The Experimental Group Was Tested With A Motivational Strategy For Learning Questionnaire (Mslq), Academic Motivation Scale And Self-Efficacy Scale, And Then The Scores Of The Two Groups Were Compared In The Post-Test. The Study Design Was A Quasi - Experimental Method With Pre -Test And Post -Test. Data Were Analyzed By Calculating Covariance Analysis (Ancova). The Results Show That The Teaching Of Self -Regulation Learning Strategies Has Had A Significant Impact On Students 'Academic Motivation And Self -Efficacy.
15	Marzita Puteha,Mah ani Ibrahim. 2010	Perak Malaysia	Primear	Survey Questionnair e	249 Form Four Science Stream Students.	This Article Presents Findings On Self -Learning Strategies Among Form Four Students In Perak, Malaysia. Case Studies Are Used To Determine The Use Of Self -

		1	1	1		Organizad Stratagies Assess
						Organized Strategies Among
						Students And How It Helps Students
						In Solving Mathematical Problems.
						Besides That, The Level Of
						Motivation Among Students Was
						Also Identified. Data Were Collected
						Through Motivated Learning
						Strategies Questionnaire Revision
						(Mslq-R), Reviewing
						Students 'Written Responses (Tests)
						And Interviews. Studies Show The
						Level Of Motivation And The
						Existence Of Self -Learning
						Strategies Among Students. This
						Research Has Shown That There Is A
						Strong Relationship Between Self -
						Regulated Learning Strategies And
						Students 'Problem -Solving
						Performance.
16	Toit Et Al	South	Primear	Survey	Grade 11	Teachers And Students Who Follow
	2009	Africa		Research	Student S	Teaching Process And Mathematical
					And Math	Learning Using Metacognitive
					Teacher	Strategies Showed Higher Levels Of
						Satisfaction Than Before Using
						Metacognitive Strategies. Therefore,
						Teachers Have Used Metacognitive
						Strategies In Their Teaching
						Showing High Satisfaction Rates
						And Student Achievement Increased
						Dramatically In Mathematics
						Subjects.
17	Lee, 2008	South	Primary	Correlational	Ba	The Results Show That Self -
		Kore A			Students	Learning Strategies Effective On
						Students Stratification As Well As
						The Education System And On Their
						Academic Achievement. A Student -
						Centered Learning Environment Is
						More Enjoyed Than The Content Of
						Self –Directed Learning Strategies -
						Or A Teacher -Centered
						Environment.
18	Dignath, Et	German	Primary	Review	Articles	Training Program Or Self -
	Al 2008 30	Y/Fr		Meta-		Regulatory Strategies Has The Most
		Ankf Urt		Analysis		Impact Even To Academic
						Achievement Elementary School
						Students. After Analyzing The Test
						Results Showed The Effect Of A
						Number Of Moderate Variables Such
						As Learning And Training
						Characteristics. About The Factors
						Related To Treatment Content,
						Which Is Effective Against The

						Literature Theory On Intervention
						Domain Experiments. Additionally,
						Cognitive Strategies And
						Metacognitive Or Motivational
						Training As Well As Teamwork As
						Methods Used. They Have A
						Positive Effect On The Academic
						Achievement Of Students.
19	Berthold Et	German	Premier	Eksperiment	Psycology	Result Shows That Cognitive
	Al 2007			al	Students	Strategies Against Students With
						Combined Strategy
						23
						Metacognitive Has Significant
						<i>U</i> ,

## 4. Analysis And Discussion

This Systematic Literature Review Aims To Look At Students' Academic Achievement After Using Learning Strategies (Cognitive-Metacognitive). Learning Strategies Have A Very Important Role In Explaining Differences In Academic Achievement. The Results Of This Study Show That Cognitive And Metacognitive Strategies Need Each Other So That Students' Academic Performance Can Be Maximized, Both Of These Strategies Should Be Applied Because Most Data Show That Failing To Master Cognitive And Metacognitive Strategies Will Cause Student Performance To Be Low (Mesrabadi, Erfani & Adab, 2014). According To A Study Conducted By Napapat Thongwichit (2021) Which Is Supported By Data From Student Learning Logs There Is Stated That, There Is Continuous Progress In Reading For Students Who Use Metacognitive Strategies.

In Addition, Students 'Perceptions Reflected Positive Outcomes On The Use Of Metacognitive Strategies When Reading. In Conclusion, This Study Suggests That Metacognitive Reading Strategies Should Be Integrated, Not Only In English Reading Classes, But Also In Other Classes Engaged In Reading Activities To Enhance Students 'Mastery Of Strategies Capable Of Improving Their Reading Comprehension. Whereas According To Cecilia Guanfang Zhaoa (2021) Who Used Questionnaire Instruments To Test The Effectiveness Of Metacognitive Strategies On Student Writing Development Suggested The Need For Measurement In More Detailed And Sophisticated Metacognitive Strategies For Future Research, Especially In Initial Instrument Planning, Testing And Impact. Such New Evidence Could Provide Pedagogical Information In Writing, Especially When Faced With The Need To Integrate Metacognitive Strategy Instruction Into L2 Writing Classes. The Results Of Different Studies Indicate That Both Cognitive And Metacognitive Strategies Are Highly Effective On Students 'Academic Success And Achievement. The Results Of A Study Conducted By Maroofi (2014) And Karami (2013) Showed That Cognitive And Metacognitive Strategies Had The Greatest Impact On Academic Achievement In Students Taking Experimental Science Courses And Most Students Who Used These Strategies Were More Successful Than Those Who Did Not Use Them. Moreover, The Results Of Salehi's (2013) Study Show That Nursing Students Use Repetition And Training Strategies And Semantic Expansion More Than Structuring Strategies And Critical Thinking. It Can Be Said That This Method Causes Readers To Be Active As They Process Information Through Effective Thinking And There Is Improvement In Terms Of Learning.

While The Findings Of Studies Conducted By Magogwe (2013), Zhang (2013) And Eluemuno (2013) Show That Cognitive And Metacognitive Strategies Are Important To Train And Ensure Good Achievement In English And Academics Of Students On This Course. Metacognitive Strategies Are Very Helpful To Achieve Success In Learning And Academic Achievement And This Issue Is Because Metacognitive Strategies Are Considered In The Learning Process As One Of The Important Cognitive Actions, And Its Role Is To Enhance Students Abilities In Realizing Their Potential. Henk And Graaff (2004) Believe That In Metacognitive Strategies, Students Are Trained With Self -Regulation, Understanding Of Learning Subjects, And A Sense Of Knowing. The Self -

Organizing Student Identifies His Or Her Own Purpose And When He Or She Deviates From Accessing It Purposefully, Actively Manages Learning.

Research Conducted By Peng (2012) And Lee (2008) Showed That Cognitive And Self -Regulatory Strategies Are Effective And Give Students A Positive Perception Of The Education System In Improving Their Academic Performance. Regarding The Results Of Different Studies, It Can Be Seen That Cognitive And Metacognitive Strategies Have A High Positive Effect On Students 'Academic Achievement. It Is Recommended That Cognitive And Metacognitive Strategies Be Simultaneously Considered Curriculum Priorities In Schools And Educational Institutions. Training Cognitive Strategies Such As Doing Mental Exercises Can Help Students Choose Things That Are Important And Worth Remembering And It Is Very Important To Find The Meeting Point Between What Has Been Remembered, Then Processed And Studied (Sifert, 1991).

### 5. Conclusion

This Study Was Conducted With The Aim Of Identifying The Effectiveness Of Cognitive And Metacognitive Strategies On Student Learning Mastery. This Study Also Takes Into Account Aspects Of Teaching And Facilitation Weaknesses (Pdpc), Student Readiness, Low Motivation For Each Student And Their Ability To Master Each Skill Found In Reading Activities As Well As Students' Need To Master Skills Through Self-Learning. An Intervention Plan Was Designed By The Researcher To Help Students Master The Skills Quickly And Quickly That Is To Use Metacognitive Strategies (Preview: Question, Read, Reflect, Recite And Review).

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