



An Examination Of Pedagogical Approaches In Mathematics Education: A Study Conducted In A Prominent Chinese Region

1st Nuenjiya , 2nd Midhun Chakkaravarthy, 3rd Nidhi Agarwal

Abstract

The Focus Of This Study Was To Compare And Contrast Middle School Pupils In China Based On Their Grasp Of The Mathematics Curriculum. Since The Results Demonstrate That Maths Teachers In The Two Countries Have Significantly Different Perspectives On Pedagogical Issues, This Research Has Significant Implications For The Field Of Mathematics Education. Helping Pupils Grasp Mathematical Concepts And Procedures Via The Use Of More Traditional, Less Flexible Teaching Techniques Is Still A Top Priority For Many Chinese Educators. The Chinese Maths Teachers Used A Wide Variety Of Exercises That Encouraged Students To Think Creatively And Independently In Order To Improve Their Students' Understanding Of Mathematical Concepts. Every Approach Has Its Own Set Of Pros And Cons. Educators In One Country May Adjust Their Practices To Make Up For Those In Another. Looking At Mathematics Education In China And Other East Asian Nations From A Global Perspective, Research Is Still In Its Early Stages. Many Western Academics Are Interested In Finding Ways To Enhance Mathematics Instruction In Western Countries. On The Other Hand, As Math Teachers In China, It Is The Researcher's Duty To Make Sure That Research Like This Helps Advance Math Education In The Researcher's Country. Comparing The Researcher's System To Other Countries' May Help The Researcher See Where The Researcher Stand And Where The Researcher Might Make Improvements. The Researcher Can Now State With Confidence That A Thorough Evaluation Of China's Mathematics Education System Is Long Overdue. Several Chinese Cities Have Likewise Updated Their Maths Programs To Reflect This New Way Of Thinking. Here The Researcher Take A Look Back At The Last 20 Years Of Study In These Areas To See What The Researcher Can Learn About Mathematics Education.

Keywords: Aspects Of Mathematics Education, Mathematical Practice, Pedagogical Methodologies, Chinese Communities, Recent Developments In Mathematics Education.

1. Introduction

Using Games And Other Forms Of Play Is Becoming Increasingly Common In Current Methods Of Teaching Maths To Primary School Kids. Improving The Children's Mathematical Comprehension And Skill Is The Goal Of This Approach. China Takes Great Pride In Its Early Childhood Education System's Long History Of Reform, Which Has Been Heavily Influenced By Progressive Western Ideas And Practices. Some Chinese Teachers Are Beginning To Get The Notion That Students Learn More While They Are Enjoying Themselves. The Chinese Government's Regulation On The Subject Has Had A Noticeable Impact. The People's Republic Of China Ministry Of Education Issued The Guidelines For Early Childhood Education (Trial Version) In 2001, Which Said That Early Childhood Educators Should Assist Children's Development By Promoting A Play-Based Approach. The Chinese Government Has Responded By Revising Its Policies On The Development And Education Of Children Aged Three To Six To Include Classroom Play. In Order To Assist Students Enhance Their Mathematical Abilities, The Guidelines Suggest Introducing Problem-Solving And Self-Discovery Strategies Into Mathematics Lectures. It Has Long Been Mandated By The Chinese



Constitution That All Elementary Schools Provide Mathematics Instruction (Mulenga & Marbán, 2020).

There Is A Pressing Demand For Mathematical Literacy Because Of The Long-Standing Respect For Mathematics In Chinese Society. Chinese Preschool Teachers Have It Rough: First, They Have To Adapt Their Curricula To Put More Emphasis On Children's Arithmetic Development; Second, They Have To Find Ways To Encourage This Development Via Play. Early Childhood Educators (Ec Teachers) Are The Most Vocal Advocates For School Reform. Many Of These Preschool Teachers Are Having Trouble Implementing The Political Demands For A Play-Based Pedagogy In Their Own Classrooms. Western Society Places A Premium On The Link Between Play And Education. But The Seeming Tension Between The Two Has Shaped Chinese Kids' Views Of Play. The Lengthy Tradition Of Play-Based Education In China Seems At Conflict With The Collectivism And Confucianism That Have Long Been Ingrained In Chinese Ideology. In Contrast To Its Confucian Roots, Which Emphasise Teacher Domination And Control, Western Play-Based Pedagogy Places An Emphasis On Child-Centered Learning. This Seems To Represent A Significant Conceptual Change For Chinese Early Childhood Educators. Furthermore, Collectivism Places An Emphasis On Group Effort Rather Than Individual Children's Needs And Interests. Chinese Preschool Teachers Are Attempting To Adapt Western Play Pedagogy Methods Into Their Curricula In An Effort To Satisfy Parents' And Society's Expectations. Regrettably, The Policy Guidelines Fail To Provide Enough Theoretical And Practical Guidance About Play-Based Education. The Result Is A Chinese Kindergarten Curriculum That Incorporates Elements Of Both Teacher-Centered And Play-Based Pedagogies. There Is A Dearth Of Research, However, On The Topic Of How Chinese Preschool Educators Plan To Include Play Into The Mathematical Curriculum. Scholars Should Examine How Mathematics Teachers' Perspectives Impact Lesson Design And Implementation Now That The Guidelines Have Been A Component Of China's Educational Reform For Twenty Years. To Better Address The Requirements Of Chinese Society, This Approach Could Work Better (Ye Et Al., 2023).

2. Background Of The Study

As An Example, Shanghai And Beijing Students Have, For Many Years Running, Maintained High Scores On Timss And Pisa, Two Worldwide Math Assessments. Students From Several Nations Take These Exams. Because Of This, China's Mathematics Education Is Well Regarded Worldwide. A Thorough Understanding Of Mathematical Concepts, Proficiency In Their Procedures, And Mastery Of Those Ideas Have Long Been Prioritised In China's Educational Policy. In Previous Instances, This Has Transpired (Leikin & Sriraman, 2022). Many Nations Throughout The Globe Are Taking An Interest In China's Educational Institutions Because Of These Accomplishments. Discipline, Perseverance, And Reverence For Educators Are All Profoundly Impacted By Cultural Factors. Those Cultural Influences Founded On Confucianism Are An Exception To This Rule. Afterwards, These Factors Cause A Change In The Classroom Aura. Conversely, Modern Educational Reforms Have Advocated For A More Holistic Approach, With A Focus On Combining Conventional Wisdom With Student-Centered Learning, Critical Thinking, And Problem-Solving Abilities. Some Think This Tactic Is Counterproductive Since It Challenges The Status Quo. Mathematics Instructors Throughout A Large Area Of China Are The Focus Of This Study, Which Aims To Examine How They Combine Traditional And New Methods. This Is On Top Of The Fact That The Researcher Still Need To Figure Out How This Pedagogical Fusion Affects Student Engagement And Performance In The Classroom. Mathematical Education In China And Other



Nations Throughout The World May Benefit From A Better Grasp Of These Techniques (Li, 2025).

3. Purpose Of The Research

Maths Education In A Strategically Important Portion Of China Is The Focus Of This Study, Which Aims To Examine And Assess Current Practices In The Field. The Purpose Of This Research Is To Identify The Best Practices For Mathematics Education In Order To Raise Students' Mathematical Understanding, Motivation, And Achievement. In Order To Do This, The Researcher Shall Investigate Many Methods Of Teaching. Methods That Fall Under This Category Include Both More Conventional Approaches, Where The Teacher Takes The Lead, And More Modern Ones, Where The Student Takes Centre Stage. The Study's Secondary Objective Is To Learn How This Specific Educational Context's Cultural, Institutional, And Policy Factors Influence The Methods Of Teaching Employed There. Another Important Goal Of The Research Is To Provide Evidence-Based Insights That Might Help Shape Mathematics Education Going Forward. To Supply This Is The Project's Primary Objective. Not Only Will China Put These Ideas Into Practise, But Other Countries' Educational Systems Will As Well, As They Seek To Replicate China's Remarkable Achievements.

4. Literature Review

Nearly All Studies Examining Educators And Their Training Agree That "Teacher Knowledge" Is An Abstract And Multi-Faceted Concept. These Three Aspects Are Seen As Crucial To Instructors' Competence As Professionals, And They Also Serve As Indicators Of Successful Maths Teaching And Students' Mathematical Learning. Furthermore, The Knowledge That Educators Have Is Seen As A Mental Product That Is Shaped And Established Inside The Confines Of The Classroom. The Way Educators Acquire Information In Their Field Is Greatly Affected By The Social And Cultural Traditions And Conventions That Are Present In A Particular Setting. This Means That The Components Of Teacher Knowledge, As Described For Teachers In A Particular Context, Show A Varied Pattern Of Strengths And Weaknesses. Previous Comparative Research Across Various Nations Have Shown That Teachers From Varied Backgrounds Have Distinct Disparities In Their Knowledge Levels (Wijaya Et Al., 2022).

In Contrast, This Structure Is Made Up Of Several Steps Or Parts, Including Paying Attention To Important Events In Class, Considering Or Analysing These Events, And Choosing Appropriate Responses. The Studies Done On The Topic Of Teachers Noticing Have Led To This Unanimity. A More Consistent Way Of Thinking About The Steps Or Parts Of Teacher Noticing Does Emerge From Time To Time. To Be More Precise, These Parts And Processes Are Said To Be Cyclical And Interdependent. On The Other Hand, Researchers May Zero In On One Specific Area, Like Attending Or Information Interpretation, To Study In Depth (Cevikbas Et Al., 2022).

5. Research Question

- How Does Assessment Practice Impact Mathematics Education In A Chinese Region?

6. Research Methodology

6.1 Research Design: The Quantitative Data Analysis Was Conducted With Spss Version 25. The Odds Ratio And 95% Confidence Interval Were Used To Assess The Magnitude And Direction Of The Statistical Link. The Researchers Determined A Statistically Significant Threshold Of $P < 0.05$. A Descriptive Analysis Was Performed To Identify The Main



Components Of The Data. Quantitative Approaches Are Often Used To Evaluate Data Obtained From Surveys, Polls, And Questionnaires, As Well As Data Modified By Computational Tools For Statistical Analysis.

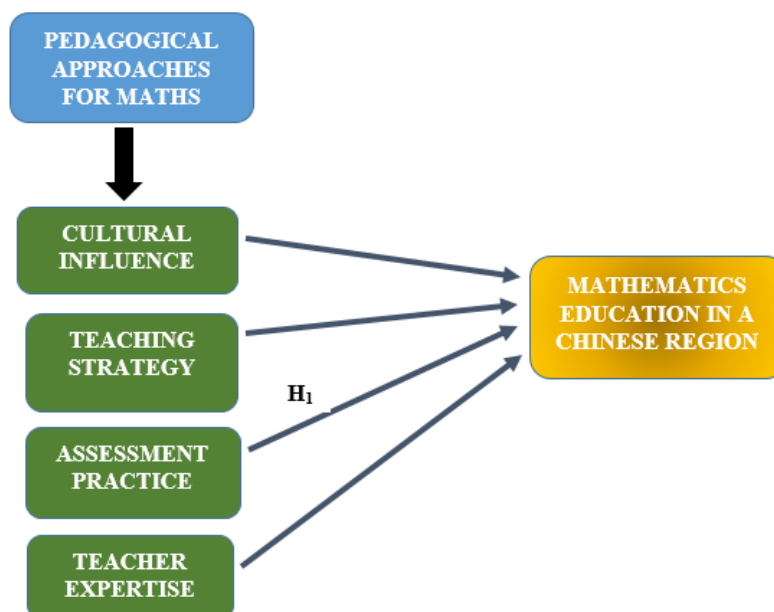
6.2 Sampling: An Uncomplicated Sampling Technique Was Used For The Study. The Research Used Questionnaires To Gather Data. The Rao-Soft Program Determined A Sample Size Of 1784. A Total Of 1964 Questionnaires Were Distributed; 1906 Were Collected, And 38 Were Rejected Due To Incompleteness. A Total Of 1,868 Questionnaires Were Used For The Study.

6.3 Data And Measurement: The Investigation Mostly Used A Questionnaire Survey For Data Collection. Participants Were First Requested To Provide Fundamental Demographic Details. Participants Were Then Instructed To Evaluate Several Facets Of The Online And Offline Channels Using A 5-Point Likert Scale. Diverse Sources, Particularly Internet Databases, Provide Secondary Data.

6.4 Statistical Software: The Statistical Analysis Was Conducted Using Spss 25 And Microsoft Excel.

6.5 Statistical Tools: Descriptive Analysis Was Used To Comprehend The Essential Attributes Of The Data. The Researcher Must Do A Data Analysis Using Anova.

7. Conceptual Framework



8. Results

❖ Factor Analysis

A Common Use Of Factor Analysis (Fa) Is To Uncover Latent Variables Within Observable Data. In The Absence Of Definitive Visual Or Diagnostic Indicators, It Is Customary To Use Regression Coefficients For Assessments. In Fa, Models Are Crucial For Success. The Objectives Of Modelling Are To Identify Errors, Intrusions, And Discernible Correlations.



The Kaiser-Meyer-Olkin (Kmo) Test Is A Method For Evaluating Datasets Generated By Multiple Regression Analyses. The Model And Sample Variables Are Confirmed To Be Representative. The Data Exhibits Redundancy, As Shown By The Figures. Reduced Proportions Improve Data Comprehension. The Kmo Output Is A Numerical Value Ranging From Zero To One. A Kmo Value Ranging From 0.8 To 1 Indicates A Sufficient Sample Size. Kaiser Delineates The Acceptable Boundaries As Follows: The Subsequent Approval. The Conditions Established By Kaiser Are As Follows:
A Regrettable 0.050 To 0.059, Inadequate 0.60 To 0.69
Middle Grades Often Span From 0.70 To 0.79.
Demonstrating A Quality Point Score Ranging From 0.80 To 0.89.
They Are Astounded By The Range Of 0.90 To 1.00.

Table 1: Kmo And Bartlett's Test For Sampling Adequacy Kaiser-Meyer-Olkin Statistic: 0.980

The Results Of Bartlett's Test Of Sphericity Are As Follows: The Chi-Square Statistic Is About 190, With 190 Degrees Of Freedom And A Significance Level Of 0.000, So Substantiating The Accuracy Of Assertions Made Just For Sampling Purposes. Researchers Used Bartlett's Test Of Sphericity To Evaluate The Relevance Of The Correlation Matrices. The Kaiser-Meyer-Olkin Measure Indicates That A Value Of 0.980 Denotes An Adequate Sample Size. The P-Value Obtained From Bartlett's Sphericity Test Is 0.00. A Favourable Result From Bartlett's Sphericity Test Indicates That The Correlation Matrix Is Not An Identity Matrix.

Table: 1 KMO and Bartlett's

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.980
Bartlett's Test of Sphericity	Approx. Chi-Square	3252.968
	df	190
	Sig.	.000

Bartlett's Test Of Sphericity Further Validated The Significance Of The Correlation Matrices. The Kaiser-Meyer-Olkin Measure Of Sampling Adequacy Is 0.980. Researchers Computed A P-Value Of 0.00 Using Bartlett's Sphericity Test. The Researcher Acknowledges That The Correlation Matrix Is Flawed Owing To A Significant Outcome From Bartlett's Sphericity Test.

❖ Independent Variable

➤ Pedagogical Approaches For Maths

Mathematics Educators In China Would Do Well To Get A Copy Of Reading Mathematics Education: A Practice-Based Pedagogical Approach. The Educators In China Will Be Using This Book In Their Classrooms And Schools. Examining Influential Theories And Methods In The Field Of Mathematics Education Is The Goal Of This Book. To Achieve This Goal, It Draws On A Wide Range Of Theoretical Frameworks Related To Mathematics Education, Such As Cognitive, Historical, Socio-Cultural, And Critical Perspectives. It Does This Via



Focussing On Research And Hands-On Experience. The Major Goal Of This Book Is To Help Readers Get A Better Knowledge Of The Fundamental Concepts, Methods, And Exercises Involved In Mathematics Education By Providing A More Thorough And Connected Framework For Doing So. Mathematics, Instructional Methods, Student Learning, And Professional Identities Are The Focus Of This Endeavour, Which Aims To Educate Future Math Educators, Teacher-Educators, And Masters And Doctoral Degree Candidates In Mathematics Education. Getting There Will Need Some Digging Into One's Own Mental Processes And Doing Some Soul-Searching. Pedagogical Content Knowledge (Pck) Is Created Via The Use Of A Wide Range Of Activities And Materials At The Middle And Secondary School Levels. The Purpose Of This Is To Teach Basic Mathematical Principles. Considering The Extensive Social, Cultural, Linguistic, And Mathematical Diversity In Indian Schools Is An Important Part Of Contextualising Pck (Bryant & Rao, 2019).

❖ Factor

➤ Assessment Practice

Assessment Practice Is All About Improving Teaching And Testing Over Time Via Cycles, Reflection, And Practical Evaluation Approaches. This Is Especially True When It Comes To Online Learning And Educational Technology. During Assessment Practice, There Are Several Different Techniques To Evaluate The Knowledge And Abilities Of An Individual. The Legitimacy Of Certification In The Primary Health Programme Is Maintained By The Use Of Quality Assurance Measures Such As Moderation, Which Are Included In These Activities, Which Also Comprise Examinations And Practical Assessments, Respectively. Assessment Frameworks Have The Potential To Enhance These Processes. To Ensure That The Undergraduate Medical School At The University Of The Free State Is Committed To Providing Students With An Outstanding Education, Clinical Students Are Required To Undergo Rigorous Assessments (Seah, 2019).

❖ Dependent Variable

➤ Mathematics Education In A Chinese Region

Mathematics Education In Many Nations Places A Strong Emphasis On Core Competencies, High Standards, And A Well-Organised Curriculum. This Is Particularly True In Mainland China, Hong Kong, And Taiwan. Since Mathematics Is Regarded As A Key Topic In Mainland China, It Is Taught To Students From An Early Age With An Emphasis On Practice, Accuracy, And Efficient Problem-Solving Abilities. In The Hopes That They Would Understand Them, Pupils Are Asked To Rehearse Procedures Several Times And Study Them Carefully. In A Typical Classroom, The Instructor Has Complete Authority And The Students Follow A Predetermined Curriculum. Hong Kong's Educational System Draws From Both The British And Chinese Models. The Researcher Is Expected To Use Their Academic Knowledge To Address Practical Issues. Students Are Doing Well According To International Evaluations Such As The Pisa. Similarly, Conceptual Understanding And Procedural Fluency Are Highly Valued In Taiwanese Education. In Addition, During The Last Several Years, They Have Started Using More Modern Ways Of Instruction In The Classroom. Children Are Able To Do Well In Mathematics In A Variety Of Domains Due To The Cultural Emphasis On Education And The Well-Structured National Curriculum (Yang Et Al., 2022).

❖ Relationship Between Assessment Practice And Mathematics Education In A Chinese Region



When It Comes To The High Academic Standards, Cultural Values, And General Aims Of The Educational System In A Certain Location, There Is A Significant Degree Of Congruence Between The Assessment Techniques And Mathematical Instruction That Are Used In That Region. Standardised Assessment, Memorisation, And Procedural Fluency Are Often Encouraged In Many Facets Of China's Educational System, Particularly In The More Developed Sections Of The Nation. This Is Especially True In Some Of The School Districts. In Order To Guarantee That Students Do Well On High-Stakes Tests Like The Zhongkao (College Admission Test) And The Gaokao (High School Entrance Exam), These Evaluation Methods Have An Impact On Teachers' Ability To Teach Mathematics. Students Are More Concerned With Earning High Marks On Tests Than They Are With Strengthening Their Ability For Critical Thinking Or Grasping Complex Topics. This Adds To The Formation Of An Environment In Which Students Are More Focused On Achieving High Scores On Examinations. Recently, There Has Been A Push For More Formative Assessment And Techniques That Are Student-Centred In China's Education System. These Changes Have Occurred In A Number Of Different Places. As Part Of An Attempt To Strike A Balance Between A Curriculum That Is Focused On Examinations And Educational Experiences That Are More In-Depth, This Is Done. When It Comes To The Teaching Of Mathematics In China, Assessment Methods Are Of The Foremost Relevance Since They Are The Ones Responsible For Setting The Curriculum, The Pedagogy, And The Results For The Students (Chen Et Al., 2023).

Subsequent To The Above Debate, The Researcher Developed A Hypothesis That Investigates The Correlation Between Assessment Practice And Mathematics Education In A Chinese Area.

“H₀₁: There Is No Significant Relationship Between Assessment Practice And Mathematics Education In A Chinese Region.”

“H₁: There Is A Significant Relationship Between Assessment Practice And Mathematics Education In A Chinese Region.”

Table 2: H₁ ANOVA Test

ANOVA					
Sum					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	39588.620	637	5287.414	830.179	.000
Within Groups	492.770	667	6.369		
Total	40081.390	1867			

The Findings Of This Inquiry Will Be Significant. The F Value Is 830.179, Achieving Significance With A P-Value Of .000, Which Is Below The .05 Alpha Level. The Hypothesis ***“H₁: There Is A Significant Relationship Between Assessment Practice And Mathematics Education In A Chinese Region”*** Is Accepted, Whereas The Null Hypothesis Is Rejected.

9. Discussion

Mainland China, Hong Kong, And Taiwan Are Three Of China's Most Important Regions, And Each Has Its Own Mathematical Pedagogy That Reflects The Unique Blend Of Cultural, Historical, And Educational Ideals That Exists There. Mainland China, Taiwan, And Hong Kong Are All Part Of This Region. Confucian Cultural Standards Have Long Had An Effect On Mathematics In Academia, As These Results Demonstrate. Mathematical Fields Have Also Been Impacted. Some Of These Tenets Include The Significance Of Obeying Authority



Figures, Maintaining Self-Control, And Doing Well Academically. The Most Important Finding Is The Emphasis On Hands-On Learning With Instructors Taking The Lead In Class. Math Teachers In Chinese Schools Often Devote A Great Deal Of Time And Energy To Their Students' Math Classes, Ensuring Sure They Understand The Concepts And Can Apply Them With Ease. Because Of Its Influence, Culture Is Another Important Factor That Must Be Examined. Chinese Culture Places A Premium On Education, And Mathematics Is One Of The Most Revered Subjects In This Country. When Parents Are Supportive, When Expectations Are High, And When Children Have Access To Tutoring Outside Of School Hours, It Helps Pupils Flourish In The Official Education System. The Advantages Are Those. Students' Attitudes Towards Mathematics Are Shaped By This Culture Of Work Ethic And Tenacity, Which Also Inspires Young People To Pursue Mathematics Seriously From A Young Age.

10. Conclusion

When It Comes To The Topic Of Education, The Findings Of Earlier Studies Have Thrown Light On A Multitude Of New Study Avenues That Have Been Explored. In Recent Years, Student-Centered Methods Have Gained Popularity, Especially In Urban Schools That Claim Superior Test Scores. This Trend Is Particularly Prevalent In Education. This Method Has Been Quickly Adopted By Educational Institutions Located In Metropolitan Regions. Students Are Able To Develop Their Creative Skills, Acquire A More In-Depth Grasp Of A Variety Of Topics, And Foster Problem-Solving Talents That Are Relevant To Real Life When They Make Use Of Contemporary Pedagogical Tactics Such As Inquiry-Based Learning, Group Projects, And The Incorporation Of Technology. The Use Of These Strategies Makes It Feasible To Achieve The Aforementioned Benefits. Through The Implementation Of These Tactics, The Objective Is To Cultivate The Innovative And Creative Thinking Capabilities Of The Students. The Researcher Hope That By Making These Modifications, The Researcher Will Be Able To Give Students With A More Comprehensive Skill Set That Is Compatible With The Real World, Which Is Where The Researcher's Researchers Now Reside And Work. In Addition To This, The Researcher Will Make Certain That The Traditional Rigidity And Discipline That Are Associated With Chinese Mathematics Education Are Preserved. After Taking Into Consideration The Adjustments, These Are The Results That Are Sought.

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