

The Mediating Role of Parent Involvement in The Relationships Among Learner Autonomy, Teacher Support and Academic Performance of Local Chinese Primary School Students

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Abstract:

This study investigated the internal mechanism of the relationship between primary school students' learner autonomy, teacher support and their academic performance. A mediation model was constructed, focused on the mediation effects of parental involvement in the relation between learner autonomy and academic performance, and between teacher support and academic performance. A questionnaire survey was conducted among 405 students in grades 3–6 and their parents, in the city of Dingxi in Gansu Province. The result indicated the following: (1) there was a significant positive correlation between primary school students' academic performance, learner autonomy, teacher support and parental involvement; (2) parent involvement mediates the relationship between learner autonomy and academic performance; (3) primary school students' parental involvement plays a mediating role in the relationship between teacher support and their academic performance. The research results provide a reference for exploring the educational strategies of primary school students' academic performance of all school subjects.

Keywords: learner autonomy, teacher support, academic performance, parent involvement, primary school students

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I. Introduction

Education plays a pivotal role in the sustainable development of countries in the increasingly globalizing world. Primary education the foremost and basic right of each person (MoE, 2009), and it is a crucial requisite for continuous development (Okonta et al., 2021) and major life-long consequences (Cao, 2019). In China, it is a competitive, exam-oriented education system (Wang L et al., 2018; Luo Meina et al., 2020) in which competition initiates from primary school stage (Mollon et al., 2018). Academic performance has remained the primary standard of educational selection, and functions essentially in obtaining further education opportunities (Wang L et al., 2018). With the lower average score than other provinces (Liu et al., 2018), Gansu is a province located in north-west of China with relatively backwards in economic and social conditions although great progresses have been made in diverse aspects during these years (Wang & Fang, 2020). The city of Dingxi, located on an arid, mostly sterile plateau in Gansu Province, is one of the poverty-ridden regions in the country, where education remains a thorny issue (Ge Lijun, 2018). In primary schools, the most significant decrease of scores on the Educational Development Index (according to The Statistical Index System of Educational Monitoring and Evaluation in China) was shown in Dingxi (Duan et al., 2021).

It is worth noticing that disparity on academic performance is the result of a combination of students' learner autonomy, teachers support and parents' involvement both cumulatively and interactively (Li & Qiu, 2018). Learner autonomy, is originated from the western but have its roots deep in Chinese traditional culture from ancient China to nowadays modern society (Gengsheng Xiao & Yaoyao Xiao, 2019). With the emergence and rise of concepts on lifelong education and learner-centeredness, autonomous learning has gradually become

a hot topic in the realm of education both abroad and in China (Ou C, 2017; Gengsheng Xiao & Yaoyao Xiao, 2019). While most scholars concern about college students (Benson, 2016; Lin & Reinders, 2019; Dong & Mustapha, 2020) or high school learners' learner autonomy (Patall et al., 2018), very few studies have focused on primary school students (Cheng, 2020; Niemi & Niu, 2021). To cultivate learner autonomy cannot accomplish at one stroke (Garita & Elizondo, 2013), it depends on the social interaction and cooperation of teacher support and parent involvement (Lina Lee, 2016; Xie & Yang, 2020).

In 2021, Double Reduction Policy was issued in China to decrease the loads of homework and extra-curriculum among primary school students, but increase the demands of teacher support. It poses new challenges to primary school teachers on how to design the tactic homework and to support their students to not only concern on academic learning and performance but also to inspire students' passion for lifelong learning (MoE, 2021). The same year in 2021, for the first time, parent involvement becomes a national matter through legislation (MoE, 2021), and the cooperation between parents and teachers, family and school is regulated to foster students' development.

In practice, studies confirmed both abroad (Patall et al., 2018) and in China (Niemi & Niu, 2021) that students' autonomous motivation and engagement in learning decline along with their grade levels (Patall et al., 2018), especially, it is typical during the transition from primary to secondary school (Zhou et al., 2019; Niemi & Niu, 2021). If the student does not develop the habit of active learning in the primary education stage, then it is difficult to raise it later (Gengsheng Xiao & Yaoyao Xiao, 2019). From the aspects of teachers, their perceptions and practices towards developing autonomy are challenging (Godwin-Jones, 2019; Lin & Reinders, 2019; Zhou L & Li C, 2020), and those involvement tends to decrease from primary to middle school (Ribeiro et al., 2021). Very few studies exist to explore the relationship between their learner autonomy with overall academic performance of primary school students.

The above findings support the unilateral effects of primary school students' academic performance, university students' learner autonomy, teacher support and parental involvement, but fail to provide a systematic and comprehensive description of the underlying mechanisms that influence academic performance of all subjects at primary school. Concurrently, the existing literature provides no clear evidence of studies that have examined the mediational role in the relationship between learner autonomy, teacher support and academic performance of primary school students. To bridge this gap, this study focused on the effect mechanism of learner autonomy, teacher support and parent involvement, to provide strategies for improvement of academic performance of primary school students.

II. Research Objectives, Research Questions and Hypotheses

The purpose of this study is to determine the relation among academic performance, learner autonomy, teacher support and parent involvement, and to explore the mediating role of parent involvement between learner autonomy, teacher support and academic performance of local primary school students in the city of Dingxi of Gansu Province in China.

To details, the objectives of this research are as follow:

RQ1: Is there any significant relationship between learner autonomy and academic performance among local primary school students in Gansu Province of China?

H1: There is a significant relationship between learner autonomy and academic performance among local primary school students in Gansu Province of China.

RQ2: Is there any significant relationship between teacher support and academic performance among local primary school students in Gansu Province of China?

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RQ3: Is there any significant relationship between learner autonomy and parent involvement among local primary school students in Gansu Province of China?

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RQ4: Is there any significant relationship between teacher support and parent involvement among local primary school students in Gansu Province of China?

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RQ5: Is there any significant relationship between parent involvement and academic performance among local primary school students in Gansu Province of China?

H5: There is a significant relationship between parent involvement and academic performance among local primary school students in Gansu Province of China.

RQ6: To what extent parent involvement plays a mediating role between learner autonomy and academic performance?

H6: Parent involvement plays a fully mediating role between learner autonomy and academic performance.

RQ7: To what extent parent involvement plays a mediating role between teacher support and academic performance?

H7: Parent involvement plays a fully mediating role between teacher support and academic performance.

III. LITERATURE REVIEW

Academic performance

The importance of academic performance is immense, and its conceptualization is complex as well (Rincon et al., 2020). By reviewing previous studies, it is found that academic performance has been defined in two ways: (1) be summarized all-inclusive and general, and (2) be simplified as the score itself, for example, authors stated that academic performance is an integral educational phenomenon that involves both students' achievements and their experiences in various institutions and different stages of education (Rincon et al., 2020), or it refers to children's academic score ranking in class (Chen et al., 2021). Zooming to the area of primary schools, some are very close but still, not specific. It is worth notable that these scores of several key subjects cannot be equal as academic performance itself, because at the primary stage, some potential ability and skills could not be evaluated and quantified exclusively in one or two exams of the main subjects.

It is shown that factors related to academic performance are different at educational levels (Saminathen et al., 2021; González et al., 2021; Brew et al., 2021). At the primary school stage, studies demonstrate it is not only influenced by external environmental factors such as socioeconomic status (Gibson & Porter, 2021), school variables (Abdul Halik & Rafeena, 2021; Wang et al., 2021) including school quality, teachers' role and qualification (Sember et al., 2020; Abdul Halik & Rafeena, 2021; Brandt et al., 2021; Engin, 2020), and social relations within primary schools and family aspects (Masud et al., 2019; Wentzel et al., 2021; Leung et al., 2021; Magro et al., 2023), but also by internal or personal factors such as cognitive (Gibson & Porter, 2021) and non-cognitive domains (Postigo et al., 2021), and other factors, such as the learner's lifestyle (Gibson & Porter, 2021), students' lack of interest (Abdul Halik & Rafeena, 2021), and test anxiety (Rodriguez et al., 2020) as well.

From the aspects of research objectives, studies on academic performance in the primary education are initially on three points in common, which are (1) evaluated the effects of factors on students' academic performance, for example, physical activity breaks (Mavilidi et al., 2020), socioeconomic status and school types (Suna et al., 2020); and (2) explored the correlations between variables and academic performance, for instance, between happiness and academic performance (Ismail, 2020), beliefs about mathematics (Rincon et al., 2020); and (3) defined the current circumstance and seek possible solutions (Shaturaev, 2021). Regarding demographic characteristics of the participants selected, researchers are inclined to select primary school students above grade 3 and age above 8 years old (Sainio et al., 2021; Demetriou et al., 2020; Chen et al., 2021). In terms of common features on school subjects, scholars tend to concern more on the academic performance of subjects Math and Science.

In contrast to researches abroad, what stands out is Chinese educators' great concerns on academic performance of the migrant primary school students in these years. The reason could be seen from the data: in 2020, the number of children affected by population mobility (children of migrant population) in China accounted for about half of China's children's population (46.4%) (National Bureau of Statistics, 2023).

Although the term academic performance covers different types of evaluations in practice, zooming to the primary school students as participants in studies, their academic performance are mainly measured by two methods: (1) national standard examinations (Suna et al., 2020; Gibson & Porter, 2021), and (2) experimental standard tests. To facilitate interpretation, scores and grade of standard examinations (Ismail, 2020; Pozo-Rico & Sandoval, 2020) are heavily utilized worldwide to show primary school students' academic performance, however, the number of subjects selected are different (Bueno et al., 2021; Bai et al., 2020). What is interesting in researches is the dominance of the selection on the subject Mathematics, to date, all researches implemented score on mathematics as one of or the only index of academic performance in their studies. Furthermore, what is striking emerged is the almost non-existence of the study so far on the relationship between academic performance (of overall school subjects) and learner autonomy of primary school students. In a word, the gap hole relative to this study is very clear.

Learner autonomy

Introduced to language education by Holec in 1981, the concept of learner autonomy has been attractive to researches on language teaching and learning (Tharumaraj et al., 2021). Due to the relation to lifelong learning (Yujing, 2021), it could also be examined out of language learning and extend to the field out of language education (Kim & Yoon, 2021). Scholars have attempted to conceptualize it in different ways, generally, it can be classified in four types based on timeline: hypothesized in definitions (e.g., Holec, 1981; Dam et al., 1990; Little, 1996; Reinders & White, 2011); interpreted in frameworks or models (see Littlewood, 1996; Benson, 1997; Oxford, 2003; Blin, 2010; Tassinari, 2012); explained with the relation to digital technology (Hubbard & Levy, 2016; Sadaghian & Marandi, 2020; Firat, 2016; 2022; Sudusinghe & Kumara; 2021); and evolved into an increasingly social phenomenon (Blidi, 2017; Uslu & Durak, 2022).

Learner autonomy is complex and multifaceted (Holmes, 2021). Previous researches have established that students' motivation (Okumus Ceylan, 2021; Kim & Yoon, 2021) and learning strategies (Gürses, 2021; Pathan et al., 2021) are all crucial elements to it, other factors including self-efficacy (Carson, 2021; Al-Hawamdeh et al., 2023), learning styles (Admiraal et al., 2019; Yujing, 2021) and personality traits, such as extraversion, agreeableness, conscientiousness, and openness (Firat, 2022).

In view of studies on learner autonomy so far, three important themes (research areas) are emerged: (1) teachers' or/and students' perceptions and practices, for example, their perceptions be positive (Kim & Yoon, 2021; Azin & Ameri, 2021) but practice be unsatisfied (Gürses, 2021; Tuan, 2021); and (2) effects of diverse tools or methods on promoting learner autonomy, for example, tools like extensive reading (Canh, 2021), purposeful vocabulary acquisition (Almusharraf, 2021), integration of the project work (Thuan, 2021), or some technology backbone tools involving Wikis (Sadaghian & Marandi, 2021), YouTube (Rajendran & Din, 2021), E-portfolio (Aprianti & Winarto, 2021; Kiffer et al., 2021; Pospíšilová & Rohlíková, 2023), Moodle (Tharumaraj et al., 2021), Blog (Pathan et al., 2021) and ChatGPT (Agustini, 2023), but very few of them were conducted on primary school students; and (3) correlation among related variables, such as self-efficacy and will to communicate (Carson, 2021), motivation (Okumus Ceylan, 2021), learning strategies (Pathan et al., 2021), learner emotion and trait emotional intelligence (Resnik & Dewaele, 2023).

Scholars selected both questionnaire and interview in qualitative and quantitative studies to measure beliefs and perceptions towards learner autonomy (Erel & Bedir, 2021; Almusharraf, 2021). As for its level in practice, the vast majority of them have been quantitative, so questionnaires are used most in the empirical researches abroad and at home. To detail, those questionnaires can be divided into two types in terms of the research domain. The first type is questionnaire used to measure the degree of language learners' autonomy in EFL or ESL context in which examples of other variables are attitudes, skills, and strategy used (Tajmirriahi &

Rezvani, 2021); readiness, ability, responsibility and use of English (Okumus Ceylan, 2021); and three dimensions of engagement (behavioral, cognitive, and emotional engagement) and academic performance (Jiang & Peng, 2023). Another category is questionnaire constructed on the basis of Self-Determination Theory used to measure students' autonomy in the realms of education and psychology. They are titled as Relative Autonomy Index (Bao & Lam, 2008; Zhou et al., 2019) or the Autonomy Scale (Skinner et al., 2008), and featured by four subscales: external motivation, introjected motivation, identified motivation, and intrinsic motivation with a formula to calculate the result (Bao & Lam, 2008; Zhou et al., 2019; Skinner et al., 2008).

It is shown that the existing literature on learner autonomy is extensive but focuses particularly on students at tertiary level. Although many studies were carried out on primary school students published in Chinese mandarin in China, considering the limitations discussed, there is a very relatively small body of literature that is concerned with primary school students' learner autonomy in school and at home. Therefore, there is a particular need for research which focuses on learner autonomy and the case of primary school students (Ömer, & Yukselir, 2021).

Teacher support

Literally, the term teacher support is easy and understandable, however, when teacher support plays the role as a main variable examined in empirical study, its interpretation needs to be integral with strong scientific theoretical underpinning. Therefore, three broad categories of interpretation with different theories as backbones were classified. According to Authoritative School Climate Theory, teacher support refers to support student perceived at school about how teachers respond to the social and emotional needs by demonstrating warmth, acceptance and understanding (Kim et al., 2021). In the Social Support Model, teacher support can be viewed into broad or narrow ways. The former regards it as a teacher giving informational, instrumental, emotional or appraisal support to a student in any context (Varga et al., 2023). The latter defines it in the forms of help, trust, friendship, and interest only in a classroom environment (Lei et al., 2018). Self-Determination Theory offers the definition as well which suggests that teacher support takes place when students receive cognitive, affective, or autonomy support from a teacher during the learning process (Lei et al., 2018). In this manner, teachers play the key role in connecting parents, working together to meet student needs, which is demonstrated as the significant positive factors of improving academic performance (Van et al., 2021).

Previous studies have established that teacher support can be influenced by factors as teachers' personal traits (Alrajeh & Shindel, 2020; Schweder & Raufelder, 2019) and social support from agents (Coyle et al., 2022; Cipriano et al., 2019), on the other hand, it has been demonstrated that teacher support have links with students' engagement and motivation (Zhou et al., 2019; Rautanen, 2021; Archambault et al., 2020; Zhao et al., 2019), academic emotions (Li et al., 2021; Ma et al., 2021) and other factors, such as needs satisfaction (Ahn et al., 2021; Baten et al., 2020), students learning interest (Lazarides et al., 2019; Oppermann & Lazarides, 2021; Zhao et al., 2019) and parental support or involvement (Feng et al., 2019; Li et al., 2021).

There are some similarities and differences among researches abroad and in China on the topic of teacher support, and the related keywords are autonomy support, school subjects and student engagement. In addition, left-behind children and migrant students could be signals to mark the differences among researches on teacher support outside and in China. Considering its importance and uniqueness, foreign scholars are keen to study autonomy support when they concern about teacher support. Besides the school education as a whole, scholars inclined to study teachers' support on subjects Maths (Lazarides et al., 2019; Oppermann & Lazarides, 2021; Li et al., 2021), Science (Patall et al., 2018; Pietarinen et al., 2021) and also Physics (Ekatushabe et al., 2021) but not subjects on humanities and social sciences. In addition, Chinese educators make more efforts on the subject Maths at primary school level (Li et al., 2021) and more on English learning in secondary education.

Among instruments to measure teacher support, questionnaire is one of the most common tools used in quantitative studies on primary school students, and three questionnaires are selected to be analyzed in this study. Teacher As Social Context Questionnaire (Belmont et al., 1992) was used (Ahn et al., 2021; Baten et al., 2020) to measure students' perceptions of teacher need-supportive practices with three subscales and eight items for

each (Autonomy support, Structure support, and Involvement support), but teachers' emotional support are not included. The Learning Climate Questionnaire has been widely used in previous Self-Determination Theory (SDT) related researches with satisfactory validity and reliability (Zhou et al., 2019) to assess students' perceptions of autonomy support (Ekatushabe et al., 2021). The Questionnaire on Perceived Mathematics Teacher Support is a Chinese-language instrument developed by Chai and Gong (2013). This 5-point Likert questionnaire consists of three subscales (autonomy support, cognitive support, and affective support with high validity and reliability (Feng et al., 2019).

Parent Involvement

According to Mohamed (2021), parent involvement influences every part of children's daily life, especially when they need support academically and socially at primary education level. By reviewing the literature, four ways of defining parent involvement are recognized, they are (1) being in a general sense (Latipah et al., 2021; Cashman et al., 2021); and (2) collaboration of social agents, for example, home-school collaboration (Hoover-Dempsey & Sandler, 2005; Wei & Ni, 2023) or home-school-community cooperation (Epstein, 2018; Krage, 2018); and (3) gendered parenting, for example, maternal involvement and paternal involvement (Pablo et al., 2021; Huang et al., 2021); and (4) interpretation in parent styles, for example, authoritative, authoritarian, permissive and uninvolved parent (Tus, 2021); or supportive, tiger, and easy-going style (Xie & Li, 2018).

It has been confirmed that, on the one hand, parent involvement can be influenced by their own demographical characteristics, such as gender (Rahman et al., 2021; Huang et al., 2021), education level (Naite, 2021; Ribeiro et al., 2021), marriage status (Naite, 2021) and family socioeconomic status (Gu, 2021; Guo et al., 2018), children' educational level (Erol & Turhan, 2018; Xie & Li, 2018) and their cultural context, for example, the ethnic and cultural background (Mohamed, 2021; Tse et al., 2021); on the other hand, parent involvement has the proved impacts on students learning and development, especially students' motivation and learning outcomes (Jhoselle Tus, 2021; Naite, 2021; Ferraces Otero et al., 2021).

A growing number of researches on parent involvement are including many aspects such as correlations between parent involvement and student motivation and engagement (Zulfiqar et al., 2023; Rautanen et al., 2021), current perception and practice (Levinthal et al., 2021; Krage, 2018), and school-based strategies on parent involvement (Yulianti et al., 2022). Zooming to the studies on primary school education in China, two topics are emerged. They are school-centred strategies and/or management on parent involvement (Zhengrong Bai, 2019; Wei & Ni, 2023), and homework-related parent involvement (Wei et al., 2022). Due to the enact of "Double Reduction" Policy (MoE, 2021) and Family Education Promotion Law (MoE, 2022) in China, situation is changed gradually, but studies published on this are rare.

In addition, three obvious differences came into view when comparing with studies abroad and in China: community related studies, the degree of parent involvement, and grandparent caring. To date, community as one of resources is not contained in the Chinese researches on the topic of parent involvement no matter from the aspect of variables or instruments, while it is discussed and measured in studies abroad very often (Rautanen et al., 2021; Hong, 2021). Regarding to the degree of parent involvement, Chinese scholars use the term parental absence (Zhou Q et al., 2021), parental involvement (Gao & Ng, 2017; Liu et al., 2013) and tiger parenting (Xie & Li, 2018) to show different extents of parent involvement in the context of China, while scholars abroad use parent involvement and parent engagement commonly when carry on studies (Núñez et al., 2019; Krage, 2018; Goodall, 2018). The third is about grandparent caring, connecting with the migrant children and left-behind children, it is an unavoidable social phenomenon influencing children's learning and education in China (Silverstein & Xu, 2022).

It is found that scholars use interview to explore perceptions or beliefs towards parent involvement (Levinthal et al., 2021), and implement questionnaire to measure its scale in practice. In this study, three questionnaires are analyzed due to their usability, applicability, and practicability. The first is Sheldon and Epstein's Survey (2007), containing 10 sections with approximately 110 closed items designed to measure

parents' attitudes. However, the community related dimension in the original Sheldon and Epstein Survey was given up by Chinese scholars in their studies (Liu & Leighton, 2021). The Second is Parenting Styles and Dimensions Questionnaire. Parenting styles can be divided into authoritative, authoritarian, permissive and uninvolved (Baumrind, 2017) or support and control (Ferraces Otero et al., 2021), and they are studied by many scholars across the world. The third is the Parental Involvement Questionnaire (Lv et al., 2019), which is a 29-item self-report inventory adapted from previous parental involvement research (Green & Hoover-Dempsey, 2007). It contains five dimensions of involvement, and all items are developed based on Chinese culture (Guo et al., 2018).

Theoretical and Conceptual Framework

Given the objectives of this study, Constructivism Learning Theory (CLT) and Self-Determination Theory (SDT) establish the theoretical foundation educationally and psychologically. Based on CLT, learner autonomy is emphasized and formed in the learning process based on learner's active and initiated learning in a social context, in which the teacher supports students by playing the role as a facilitator but not the center, by scaffolding students' learning to narrow ZDP and make progresses gradually, and then leads to the desired academic performance. In this vein, the relationships among learner autonomy, teacher support and academic performance can be explained and supported by CLT.

From the perspective of SDT, parent involvement have a relation with the learner's basic needs of relatedness (the universal needs to interact with other human beings, be connected, and experience caring for others) at home, meanwhile, academic performance function together to meet the needs of competence (feeling one is effective in meeting environmental demands) in school. This shows that SDT is the suitable theory to underpin the two variables academic performance and parent involvement. Furthermore, by satisfying students psychological needs of autonomy, relatedness and competence, key factors as learner autonomy, teacher support, parent involvement and academic performance function combined to trigger primary school students' learning into a spiral and constant process.

A conceptual framework is an analytical tool to organize variations and contexts in empirical research. It is used to make conceptual distinctions and to organize ideas. Figure 1 displays the conceptual framework of this study with learner autonomy and teacher support as the independent variable, parent involvement as the mediating variable and academic performance as the dependent variable.

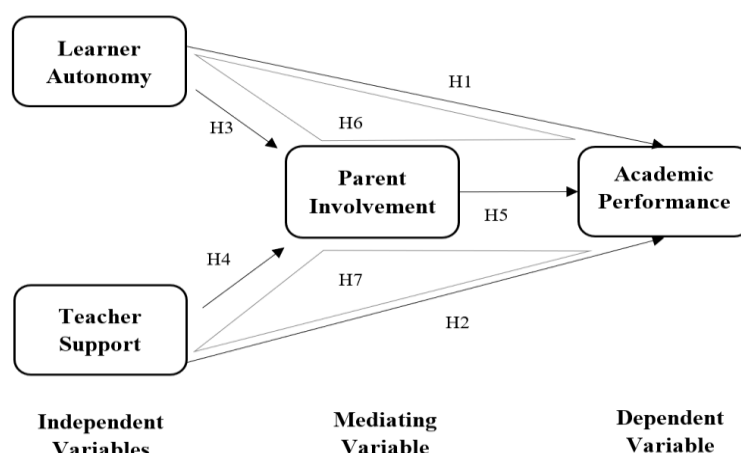


Figure 1 Conceptual Framework

IV. RESEARCH METHODOLOGY

Research Design

According to research objectives, this study utilized non-experimental quantitative method to investigate the correlations among four variables, and the cross-sectional survey research is the best choice of this study. The items in the questionnaire of this study involve the close-ended questions of Likert-type rating scales to gather views of students from local primary schools in Gansu province of China. In addition, the four variables can be quantified through using appropriate and mature instruments, therefore, this study is repeatable by other researchers in different contexts.

Population and Sample

The total number (2,009,079) of the primary school students in Gansu province is the population of the study, simple random sampling is used to make it more scientific and reliable. It is employed to select out the sample from the city of Dingxi. First, a list of all the counties in the city of Dingxi is obtained. Second, the researcher randomly selected the study county from those that meet the study criteria (e.g., public primary school with students in Grade 1-6). Third, using official records, a list of all primary schools in the sample county was created. Fourth, the researcher used official records and telephone calls to school principals to identify all schools and get the permission. Fifth, the researcher randomly selected schools that had given permission and created the sampling frame. Finally, depending on the ratio of each school to the total population, the sample size of each school were determined, and primary school students were selected randomly for inclusion in the studies. Considering problems as incomplete responses and outliers, 405 questionnaires were distributed to local primary schools.

Research Instruments

Learner autonomy (RAI)

The Relative Autonomy Index (RAI) is a scale developed by Ryan and Connell in 1989 to measure student autonomy with Self-Determination Theory as the basement and used to measure the level of learner autonomy on primary school students in studies abroad and in China (Bao & Lam, 2008; Zhou et al., 2019) with high reliability and validity (2019). It was entitled as the Autonomy Scale (Skinner et al., 2008) or Academic Self-regulation Questionnaire (SRQ-A) (Zhou et al., 2019), and featured by four subscales: external motivation, introjected motivation, identified motivation, and intrinsic motivation. An RAI score (Ryan & Connell, 1989) was calculated by the formula: $RAI = 2$ (intrinsic motivation) + 1 (identified regulation) - 1 (introjected regulation) - 2 (external regulation), and the higher score indicated the higher level of learner autonomy (Bao & Lam, 2008; Zhou et al., 2019; Skinner et al., 2008).

Teacher support (QPTS)

The Questionnaire on Perceived Teacher Support was used to measure teacher support, which is a Chinese-language instrument developed by Chai and Gong (2013) and consisted of three subscales: autonomy support (5 items), cognitive support (5 items), and affective support (7 items). All items were rated on a scale from 1 (Strongly Disagree) to 5 (Strongly Agree). It has tested high validity and reliability and used commonly

in the context of Chinese primary education with well-defined and distinct sub-dimensions (Feng et al., 2019). Even though it was originally used to measure teacher support in Math learning, considering that three dimensions of teacher support are used effectively by many Chinese studies on primary school students (Chai & Gong, 2013; Jianghe Chen, 2015; Feng et al., 2019), this questionnaire is selected to be used in this study.

Parental involvement (PIQ)

The Parental Involvement Questionnaire (Liang Luo et al., 2013) is a 29-item self-report inventory adapted from previous parental involvement research (Green & Hoover-Dempsey, 2010). The items describing parents' involvement in their children's educational activities inside and outside school are rated on a 4-point scale. Given that RAI and QPTS are all 5-point scales, PIQ was then unified into 5-point Likert as well (Chakrabartty, 2022). Five dimensions of parent involvement in this questionnaire are: parent-school contact, parent-child communication, learning assistance, parent-child activity and home monitoring. All items were developed based on Chinese culture and tested high reliability and validity (Liang Luo et al., 2013; Guo et al., 2018).

Data Collection

Data for the field study was collected under the permissions of the local school administration and respondents. It was completed after the pilot study data collection and analysis on September of the year 2023. In local primary schools in the city of Dingxi in Gansu province of China, the field study sample were chosen by using the method of simple random sampling. After removing the 189 respondents who had been participated for the pilot study from the sampling frame, 412 respondents were selected randomly for the field study. After obtained permissions from the school administration and the respondents, the questionnaire application – Wenjuanxing was used by respondents to complete the investigation. In the questionnaire, the directions and descriptions given on how to answer each part and items are clear and concise. The participants were given ample time to fill in the questionnaires online and to submit. Overall Average Score of 412 respondents from the first semester of the year 2023 were collected from school administration under their permissions.

Data Analysis

In the current study, to answer research questions, all statistical analyses including descriptive analysis, correlation analysis, and structural equation modelling analysis were carried out by using SPSS (Statistical Package for the Social Sciences, version 26.0) and AMOS (Analysis of Moment Structure, version 26.0). A range, a mean, and a standard deviation were calculated for each of the composite scores, which included learner autonomy, teacher support, and parent involvement. Then, a subsequent inference analysis was conducted in order to test all hypotheses.

V. RESULTS

Following the data analysis strategy above, the results are described in three sections: (a) descriptive statistics; (b) correlation analysis; and (c) mediation analysis.

Descriptive Statistics

The data show the almost even distribution of respondents in terms of (1) gender, and (2) age, and (3) Grade, except for (4) the relation: most of the parents who answered questions were mother (70.1%) compared to father (26.9%), with grandparents and other relative accounting for the same 1.5% respectively.

Correlation Analysis

A correlation analysis was conducted to examine the association among all the variables, and the correlation matrix is illustrated in Table 1. It shows a significant positive correlation between the four variables of academic performance, learner autonomy, teacher support and parent involvement of local primary school students. Therefore, research question 1-5 were answered, and Hypothesis 1-5 were accepted.

Mediation Analysis

According to the advantages for conducting mediation analysis (Shrout & Bolger, 2002), this study used a structural equation model to test the mediating role of parental involvement in the relations between learner autonomy and academic performance, and between teacher support and academic performance.

Figure 1 shows a mediation model mediated by parental involvement. According to the model fit results, the model fit well, RESEA = 0.05 < 0.08, CFI = 0.903 > 0.90, IFI = 0.904 > 0.90, and Chi-square/df = 2.018 < 3.0. The results showed that the measurement model has reached the ideal standard, and the observed variables can better reflect the corresponding latent variables, which can further test the structural model.

For H6 (See Table 2), the value of $0.275 \times 4.779 = 1.314 < 6.973$, that is, the value of $a \times b < c$. Both the hypotheses testing for the indirect effect between learner autonomy and parent involvement and between parent involvement and academic performance, and the direct effect of learner autonomy on academic performance are significant. Hence, the type of mediation is partial mediation. Based on the mediation analysis result, it can be concluded that parent involvement partially mediates the relationship between learner autonomy and academic performance. Hypothesis H6 aimed to determine whether parent involvement fully mediates the relationship between learner autonomy and academic performance. From the above SEM analysis results, hypothesis H6 was not accepted. Therefore, parent involvement partially mediates the relationship between learner autonomy and academic performance in this study.

For H7 (See Table 3), the value of $0.360 \times 5.289 = 1.904 < 4.687$, that is, the value of $a \times b < c$. Both the hypotheses testing for the indirect effect between teacher support and parent involvement and between parent involvement and academic performance are significant. The direct effect of teacher support on academic performance is also significant. Hence, the type of mediation is partial mediation. Based on the mediation analysis result, it can be concluded that parent involvement mediates the relationship between teacher support and academic performance. Hypothesis H7 aimed to determine whether parent involvement fully mediates the relationship between teacher support and academic performance. From the above SEM analysis results, hypothesis H7 was not accepted. Therefore, parent involvement partially mediates the relationship between teacher support and academic performance in this study.

Table 1 Descriptive statistics results and correlation matrix

Variable	1	2	3	4
1. Academic performance	1			
2. Learner autonomy	.541**	1		
3. Teacher support	.438**	/	1	
4. Parent involvement	.436**	.221**	.296**	1

N=405; *p < 0.05; **p < 0.01.

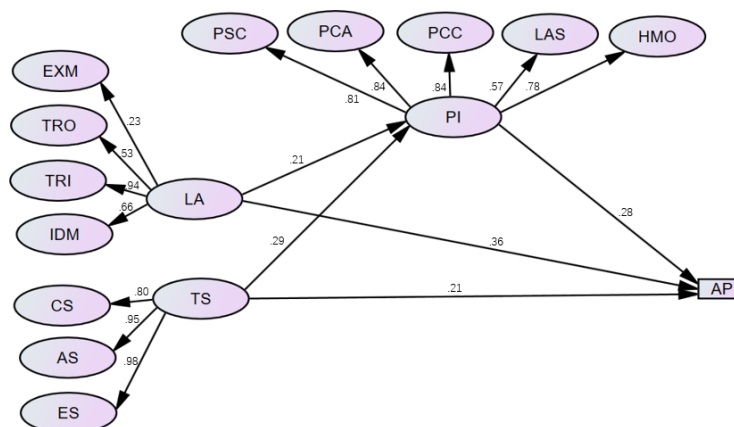


Figure 1 Model result

Table 2 Mediation Analysis Result of Parent Involvement between Learner Autonomy and Academic Performance

Construct	Path	Construct	β Estimate	S.E.	C.R.	p-Value	Result
Parent Involvement	←-----	Learner Autonomy	.275	.057	4.824	***	Significant
Academic Performance	←-----	Parent Involvement	4.779	.720	6.635	***	Significant
Academic Performance	←-----	Learner Autonomy	6.973	.818	8.522	***	Significant

Table 3 Mediation Analysis Result of Parent Involvement between Teacher Support and Academic Performance

Construct	Path	Construct	β Estimate	S.E.	C.R.	p-Value	Result
Parent Involvement	←-----	Teacher Support	.360	.058	6.172	***	Significant
Academic Performance	←-----	Parent Involvement	5.289	.802	6.591	***	Significant
Academic Performance	←-----	Teacher Support	4.687	.718	6.528	***	Significant

VI. DISCUSSION

Results revealed that the bivariate correlations of four variables (academic performance, learner autonomy, teacher support and parent involvement) were all significantly correlated, fulfilling the first condition for the test of a mediation effect of parent involvement. The results are consistent with previous research (Carson, 2021; Almusharraf, 2021; Johannessen, 2021; Brew et al., 2021; Tao et al., 2022; Qiu & Chai, 2022; Yulianti et al., 2022; Naite, 2021; Ferraces Otero et al., 2021) but are different from others (Ribeiro et al., 2021; Boonk et al., 2022; Leenders et al., 2019; Bolat, 2023; Teuber et al., 2023; Li et al., 2023). By compare and contrast, it is rather remarkable that few of scholars worked on the relation between learner autonomy and academic performance out of the field of language education, and furthermore, very few targeted on primary school students. In addition, findings recovered that, to improve academic performance of primary school

students, teachers need to provide more emotional support and parents need to communicate more with their children.

By analyzing the mediation effect, this study found that parent involvement partially mediates the relationship between learner autonomy and academic performance. This finding required further confirmation since very few studies have examined parent involvement as a mediating variable in the relationships between primary school students' learner autonomy and academic performance. Guo et al (2018) have revealed that parental involvement played critical mediating roles between family socioeconomic status and reading achievement on a sample of Chinese primary school students; Haifeng Luo et al (2021) have found that parental involvement plays a full mediating role between family socioeconomic status and learning quality including learner autonomy on Chinese high school students; Qiu & Chai (2022) have indicated that primary school students' parental involvement and sense of autonomy play a chain-like mediating role in the relationship between their peer relationships and academic performance of Chinese language. However, these resembling studies fail to provide the proof and confirmation of results in this study directly. Given that the social phenomenon about left-behind children and migration children in China (National Bureau of Statistics, 2023), this research strongly highlights the importance and cruciality of parent involvement in primary education.

Moreover, the partially mediation role of parent involvement on the association between teacher support and academic performance of local primary school students was supported, thus supporting the last hypothesis. This finding was further confirmed by some studies to some extents. Yulianti et al (2022) have found that both teacher support and parent involvement can support their children's academic achievements. Affuso et al (2023) have showed that teacher support and parental monitoring directly and positively affected motivation and self-efficacy over time, which influenced academic performance positively on adolescents at the ninth grade of schooling. They also reported that teacher support and parental monitoring indirectly effected on academic performance over time via the mediation of motivation and self-efficacy. Rautanen et al (2021) indicated that teacher support and peer support have stronger effects on study engagement in the comparison to parent involvement on fourth grade students in Finland.

Besides that, this study not only show the mediational role of parent involvement between teacher support and academic performance, but also indicate that the parents' influence was highest on parent-child communication, while the teachers' influence was highest on emotional support. All these suggest the need of implementing interventions with the aim to enhance parental involvement and teacher support to better primary school students' academic performance by accounting for the co-occurrence and combined effects of both parents and teachers.

VII. CONCLUSION

This quantitative, correlational research constructed a mediation model, which can be understood as the influence mechanism of parent involvement on primary school students' academic performance of all primary school subjects. The results of the study show that parent involvement plays a partially mediational role in the relationship between learner autonomy and academic performance, and plays partially mediating role in the association between teacher support and academic performance. Consequently, this study extends the literature on learning of all subjects in primary education an important novel direction.

In the present study, besides the mediational role of parent involvement, data highlighted that primary school students' parent involvement are significantly associated with students' academic performance, learner autonomy and teacher support. All of these results indicate the non-substitutability of parent involvement in the education of their children at the primary school stage. Although data showed that there were additional factors involved, it can be concluded that parental involvement in schooling is conducive for primary school students learning and development, especially their communication with children. Parents are important factors in the development of students' academic performance, affecting not only their level of learner autonomy at home, but also their perceived supports from teachers at school.

The results have educational implications. From a theoretical perspective, underpinned by Constructivism Learning Theory and Self-Determination Theory, this study reconfirms them and applies them to a specific context in the primary education. Practically, this study has implications for the stakeholders related but not limited to the field of primary education. First, as for the school leaders and policy-maker, it can provide clear implications on evaluation and assessment in diverse ways on primary school students' academic performance as well as on teaching qualities of the school as a whole, help them close down the gaps on academic performance and improve the overall level of local educational achievement to facilitate the education equality from the primary stage. Secondly, the present study can offer some important insights into the field of family education which gains growing concerns in Chinese education and the whole society to build a positive and friendly family atmosphere. Thirdly, this study can also provide an important opportunity to advance primary school teachers' understanding on their students' learner autonomy, academic performance and parent involvement, and can enhance teachers' knowledges and skills, then push them to be more tactical in the design and conduction of their teaching in practical. Fourthly, this study answered how primary school students' academic performance may be affected to the parents. Such that, parents can recognize the importance of parent-children communication and parent-school contact, learn to improve their involvement effectively and then their anxiety level could be reduced accordingly.

Therefore, this study expands the perspectives of previous research and offer significant empirical evidence for understanding the role of parent involvement in not only primary education, but also the whole course of development.

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