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HIGH-SCHOOL STUDENTS' PERCEPTIONS OF *CHATGPT* AS A SUPPORT TOOL FOR LEARNING MATHEMATICS

Abstract: Generative artificial intelligence is increasingly recognized as an important tool for supporting learning processes. The aim of this study was to examine high school students' attitudes toward the use of *ChatGPT* as a support for learning mathematics, with a particular focus on the role of motivational orientations, individual needs, and facilitating conditions in shaping their attitudes and intention to use this tool. The study was conducted on a sample of 99 students from a Serbian high school using a questionnaire based on the integration of the Technology Acceptance Model (TAM) and the motivational model of self-regulated learning. The results of the exploratory factor analysis identified six latent dimensions: attitudes toward the use of *ChatGPT*, intention to use, intrinsic and extrinsic goal orientation, students' individual needs, and facilitating conditions. The findings of the regression analysis indicate that students' attitudes play a central role in shaping their intention to use *ChatGPT*, while intrinsic motivation, individual needs, and facilitating conditions make significant contributions to the development of positive attitudes. The results highlight the importance of pedagogical and motivational conditions for the meaningful and responsible implementation of generative artificial intelligence in mathematics education.

Keywords: *ChatGPT*, generative artificial intelligence, mathematics education, student motivation, student attitudes

INTRODUCTION

The growing use of generative artificial intelligence (AI) in education has prompted increasing attention to its effectiveness, acceptance, and impact on students. With the emergence of generative AI, tools such as *ChatGPT* are increasingly being integrated into mathematics education, enabling the generation of ex-

planations, lesson planning, and the provision of personalized feedback, thereby fostering student engagement and self-regulated learning (Pepin et al. 2025). However, the acceptance of such tools depends on a range of factors, including students' motivation and attitudes, the availability of facilitating technological conditions, and their individual learning needs.

Existing studies (Lin, Jiang 2025; Zheng et al. 2024) emphasize the role of motivation as a key factor in the acceptance of generative artificial intelligence, while also highlighting the lack of research encompassing other educational levels. Additional studies report significant improvements in students' self-confidence, motivation, and learning outcomes when *ChatGPT* is used as a supplementary learning tool, particularly for problem-solving and programming in mathematics courses (Gouia-Zarrad, Gunn 2024; Dasari et al. 2024). In some cases, assistance generated by *ChatGPT* has produced learning gains comparable to those achieved through human tutoring, especially in algebra (Pardos, Bhandari 2024). Furthermore, teachers can use *ChatGPT* for lesson planning, generating instructional examples, and supporting students with diverse learning needs (Almarashdi et al. 2024; Taani, Alabidi 2025). Despite these benefits, the use of *ChatGPT* in education also presents several challenges. The responses generated by *ChatGPT* are not always fully accurate or appropriately tailored to students' age and prior knowledge. Moreover, the literature highlights ethical concerns, as well as the risk of students becoming overly reliant on generative artificial intelligence (Pepin et al. 2025).

The aim of this study was to examine how different forms of student motivation (intrinsic and extrinsic), individual learning needs, and facilitating conditions influence students' attitudes toward the use of *ChatGPT* in mathematics learning, as well as their intention to continue using it. Contemporary research on the acceptance of artificial intelligence in education has predominantly focused on higher education, while the high school context has received considerably less scholarly attention. This study seeks to address that gap by investigating the perceptions of students from a Serbian high school during 2025. The findings are expected to contribute to the development of pedagogical strategies for the more effective integration of AI tools into mathematics education, with particular emphasis on motivational support and the individualization of the learning process.

THEORETICAL FRAMEWORK

The theoretical framework of this study is based on the integration of the Technology Acceptance Model (TAM) (Venkatesh, Davis 2000) and the motivational model of self-regulated learning (Pintrich 1991), adapted to the educational context of generative artificial intelligence in mathematics education. Within the TAM framework, particular attention is given to students' attitudes toward technology and their intention to use it, while the motivational model of self-regulated

learning provides insight into the intrinsic and extrinsic motivational orientations that shape how students approach learning with the support of *ChatGPT*. This integrated framework enables a comprehensive understanding of the cognitive, motivational, and contextual factors influencing the acceptance of *ChatGPT* in learning mathematics.

Intrinsic Goal Orientation (IGO) refers to students' intrinsic motivation, that is, the satisfaction, curiosity, and interest derived from the learning process itself and from solving mathematical problems. Students with a strong intrinsic goal orientation perceive learning as a challenge and an opportunity for personal growth, which may encourage them to use *ChatGPT* as a tool for deepening conceptual understanding, exploring alternative problem-solving strategies, and overcoming learning difficulties independently (Zheng et al. 2024).

Extrinsic Goal Orientation (EGO) refers to motivation driven by external rewards, such as higher grades, teacher praise, or social recognition. In the context of using *ChatGPT* for mathematics learning, this orientation may encourage students to use the tool to solve problems more efficiently or achieve better academic performance. However, previous research suggests that while extrinsic motivation may facilitate the initial acceptance of technology, sustained and meaningful use depends primarily on intrinsic motivation (Liu, Lin 2010).

Individual Demand (ID) refers to students' need for *ChatGPT* to provide personalized information and learning support tailored to their individual characteristics, prior knowledge, interests, and learning pace. In mathematics education, this construct encompasses the tool's ability to deliver customized explanations, step-by-step solutions, additional examples, and alternative problem-solving approaches. Perceived adaptability and relevance of the generated content are expected to play a significant role in shaping students' positive attitudes toward *ChatGPT* (Lin, Jiang 2025).

Facilitating Conditions (FC) refer to the extent to which students perceive that they have access to the technical, organizational, and digital resources necessary for using *ChatGPT* effectively (Venkatesh et al. 2003). These conditions include access to digital devices and the internet, as well as the basic level of digital literacy required to use the tool successfully. In the Serbian educational context, where limitations in digital infrastructure and institutional support still exist, facilitating conditions represent an important prerequisite for the adoption and continued use of contemporary educational technologies (Mandić 2023).

Attitude toward ChatGPT (ATT) represents students' overall cognitive and affective evaluation of the extent to which *ChatGPT* is perceived as useful, engaging, and desirable as a support tool for mathematics learning. Positive attitudes are expected to develop when students perceive that the tool enhances their understanding of mathematical concepts, promotes greater learning autonomy, and increases learning motivation (Ergene, Caylan-Ergene 2025).

Behavioral Intention (BI) refers to students' willingness to continue using *ChatGPT* in the future as part of their mathematics learning process. According to technology acceptance models, behavioral intention is considered the strongest predictor of actual technology use (Alzahrani et al. 2019).

Based on these theoretical assumptions, this study proposes that students' motivational orientations (IGO and EGO), Individual Demand (ID), and Facilitating Conditions (FC) directly influence their Attitude toward *ChatGPT* (ATT), while ATT plays a central role in shaping students' Behavioral Intention (BI) to continue using the tool. This model therefore enables the examination of the interactions among motivational, individual, and contextual factors that contribute to the acceptance of *ChatGPT* as a support tool for learning mathematics among high school students.

Recent studies further confirm the importance of psychological and technological factors in the adoption of AI in education. A study conducted in Serbia (Milutinović 2025) demonstrated that perceived usefulness, perceived ease of use, digital literacy, subjective norm, and the perception of AI as a tool for social good significantly influence pre-service teachers' competencies and their ethical Technological Pedagogical Content Knowledge (TPACK). Similarly, another study (Milutinović et al. 2025a) found that ethical TPACK, AI for social good, and subjective norm were the strongest predictors of teachers' intention to integrate AI into their teaching practice.

In addition, another study (Milutinović et al. 2025b) highlighted the potential of advanced digital approaches in mathematics education by showing that integrating cryptographic techniques into online collaborative mathematical problem-solving activities can enhance students' collaboration, motivation, and sense of responsibility. Collectively, these studies indicate that the successful implementation of AI in education depends on well-developed digital competencies, ethical-pedagogical knowledge, and a supportive collaborative learning environment.

Nevertheless, the Serbian educational system continues to face challenges related to insufficient pedagogical and technical competencies among teachers, as well as limited digital infrastructure, which hinder the regular implementation of contemporary educational technologies (Mandić 2023). Although recent educational reforms have encouraged the development of digital education, the practical integration of information and communication technologies (ICT) remains constrained by inadequate equipment and resistance to innovation. These systemic challenges make Facilitating Conditions (FC) a particularly important determinant of the acceptance of tools such as *ChatGPT*.

Based on the reviewed literature on *ChatGPT* acceptance, this study aims to examine the factors influencing high school students' attitudes toward and intention to use *ChatGPT* for mathematics learning in Serbia. Using a model grounded in the Technology Acceptance Model and motivational constructs, exploratory factor analysis identified six latent factors: Attitude (ATT), Behavioral Intention (BI),

Intrinsic Goal Orientation (IGO), Extrinsic Goal Orientation (EGO), Facilitating Conditions (FC), and Individual Demand (ID). Accordingly, the study addresses the following research questions:

RQ1: To what extent do ATT, IGO, EGO, FC, and ID predict high school students' Behavioral Intention (BI) to use *ChatGPT* for mathematics learning?

RQ2: To what extent do IGO, EGO, FC, and ID predict high school students' Attitude (ATT) toward using *ChatGPT* for mathematics learning?

METHOD

PARTICIPANTS

The study involved 99 students from the First Grammar School of Kragujevac, Serbia, whose demographic characteristics are presented in Table 1. Of the total sample, 31 students (31.3%) were male, while the remaining participants were female. The mean age of the participants was 16.47 years ($SD = 0.96$).

Table 1. Demographic characteristics of the respondents

Variable	Category	<i>f</i>	Percentage
Age	15 years old	19	19.2
	16 years old	28	28.3
	17 years old	38	38.4
	18 years old	14	14.1
Gender	Male	31	31.3
	Female	68	68.7
Grade	Grade 1	27	27.3
	Grade 2	27	27.3
	Grade 3	45	45.5
Frequency of <i>ChatGPT</i> use for learning mathematics	Daily	6	6.1
	Several times a week	9	9.1
	Once a week	11	11.1
	Once a month	26	26.2
	Less than once a month	47	47.5
Total <i>f</i> (%)		99	100.0

Students participated voluntarily and were informed that they could withdraw from the study at any time without consequences. All ethical principles were strictly observed in accordance with institutional and academic guidelines. The completion of the paper-based questionnaire required approximately 15 minutes.

The data collection was conducted during regular school classes after participants had been informed about the purpose of the study and the questionnaire administration procedure. The participants completed the questionnaire individually using paper-and-pencil forms, with clear assurances regarding anonymity, confidentiality, and voluntary participation.

INSTRUMENT

Table 2. Scales and corresponding items

Construct (Source)	Item
Intrinsic Goal Orientation (Lin, Jiang 2025)	IGO2. I want <i>ChatGPT</i> to provide mathematics problems that stimulate my curiosity, even if they are difficult.
	IGO4. I would like <i>ChatGPT</i> to offer me more mathematics problems, even if this does not affect my grades.
Extrinsic Goal Orientation (Lin, Jiang 2025)	EGO2. I use <i>ChatGPT</i> for learning mathematics to show others how good I am at mathematics.
	EGO3. I expect praise from my teacher or recognition from my peers because I use <i>ChatGPT</i> in mathematics learning.
Individual Demand (Lin, Jiang 2025)	ID2. <i>ChatGPT</i> can recommend mathematics problems that match my level of mathematical knowledge.
	ID3. Over time, <i>ChatGPT</i> can recognize my individual learning needs in mathematics.
Facilitating Conditions (Lin, Jiang 2025)	FC1. I have the necessary digital devices and internet access to use <i>ChatGPT</i> for mathematics learning.
	FC2. I have the basic knowledge required to use <i>ChatGPT</i> for learning mathematics.
Attitude (Ergene, Caylan-Ergene 2025)	ATT2. I enjoy learning mathematics with the support of <i>ChatGPT</i> .
	ATT3. I find using <i>ChatGPT</i> while practicing mathematics interesting.
	ATT4. When learning mathematics, <i>ChatGPT</i> feels like someone who genuinely helps me.
	ATT5. I enjoy using <i>ChatGPT</i> for learning and exploring mathematics while practicing.
Behavioral Intention (Alzahrani et al. 2019; Lin, Jiang 2025)	BI1. I am willing to continue using <i>ChatGPT</i> for learning mathematics if its explanations are helpful.
	BI3. I would recommend using <i>ChatGPT</i> for learning mathematics to a friend.
	BI6. I plan to use <i>ChatGPT</i> as part of my regular mathematics learning.

DATA ANALYSIS

The statistical analyses were performed using IBM SPSS. The descriptive statistics were first calculated to summarize the central tendency and variability of all study variables. The Exploratory Factor Analysis (EFA) was conducted to examine the factorial structure of the instrument and assess construct validity. Subse-

quently, multiple regression analysis was employed to investigate the effects of the independent variables on the dependent constructs (Hair et al. 2019).

Prior to the analyses, all major statistical assumptions were examined and confirmed, including normality of data distribution absence of multicollinearity, and absence of influential outliers (Tabachnick, Fidell 2019).

RESULTS

Exploratory Factor Analysis (EFA) was conducted using the Principal Component Analysis (PCA) extraction method with Direct Oblimin rotation and Kaiser normalization, as the latent constructs were expected to be correlated. The analysis identified six clearly defined factors, which together represent the theoretical model underlying the present study. The factor loadings of the questionnaire items are presented in Table 3.

Table 3. Exploratory factor analysis

	Component					
	ATT	EGO	FC	IGO	BI	ID
ATT2	0.896					
ATT3	0.916					
ATT4	0.841					
ATT5	0.861					
BI1					0.569	-0.325
BI3					0.661	
BI6					0.753	
ID2						-0.921
ID3						-0.750
IGO2				-0.848		
IGO4				-0.830		
EGO2		0.871				
EGO3		0.949				
FC1			0.971			
FC2			0.847			

The factor analysis confirms a clear and theoretically expected structure comprising six latent variables: Attitude toward *ChatGPT* use (ATT), Behavioral Intention (BI), Intrinsic Goal Orientation (IGO), Extrinsic Goal Orientation (EGO), Individual Demand (ID), and Facilitating Conditions (FC).

All items exhibit high factor loadings, mostly $\geq .75$, indicating strong relationships between the individual indicators and their corresponding latent constructs. These findings indicate the sound internal structure of the questionnaire and the conceptual distinctiveness of each factor. The most stable and clearly dif-

ferentiated factor is ATT, which represents the strongest cluster of students' positive perceptions regarding the use of *ChatGPT* for learning mathematics.

To provide an initial overview of the data, a descriptive analysis was conducted, including the means, standard deviations, skewness, kurtosis, and reliability coefficients (Cronbach's α) for all examined variables (Table 4).

Table 4. Descriptive statistics

Variable	Mean	Standard Deviation	Skewness	Kurtosis	Cronbach's α
ATT	2.34	1.23	0.64	-0.59	0.93
BI	2.63	1.27	0.42	-0.83	0.87
IGO	2.23	1.10	0.36	-1.04	0.75
EGO	1.63	0.98	1.81	2.82	0.85
FC	3.68	1.39	-0.93	-0.53	0.83
ID	2.95	1.17	-0.27	-0.74	0.80

Students exhibit relatively reserved attitudes toward the use of *ChatGPT* for learning mathematics ($M = 2.34$), whereas Facilitating Conditions (FC) receives the highest mean score ($M = 3.68$), indicating that most participants perceive they have adequate technical resources and basic digital skills to use the tool. Extrinsic Goal Orientation (EGO) has the lowest mean score ($M = 1.63$), suggesting that students do not primarily use *ChatGPT* to gain praise, recognition, or outperform others. Instead, their use of the tool appears to be driven more by personal interest and curiosity than by external rewards. Furthermore, 47.5% of the participants reported using *ChatGPT* less than once a month for learning mathematics, indicating that the tool has not yet become an integral part of students' everyday mathematics learning practices.

To examine the relationships among the study variables, a correlation analysis was conducted (Table 5)

Table 5. Correlation Matrix

Variable	BI	ATT	EGO	IGO	ID
ATT	.704**	—			
EGO	.499**	.395**	—		
IGO	.571**	.546**	.478**	—	
ID	.519**	.500**	.396**	.493**	—
FC	.465**	.496**	.266**	.415**	.564**

Note. $p < .01$.

The results indicate that all examined variables are positively and statistically significantly correlated ($p < .01$), demonstrating their consistency and stable

interrelationships within the proposed research model. The strongest correlation is present between ATT and BI $r = .704$, confirming that students' attitudes play a substantial role in shaping their intention to continue using *ChatGPT* for learning mathematics. In addition, a moderately strong and statistically significant correlation is found between Facilitating Conditions (FC) and Individual Demand (ID) $r = .564$, suggesting that better technological resources and greater competence in using *ChatGPT* enhance students' perceptions that the system is capable of meeting their individual learning needs. The remaining correlations range from moderate to moderately strong positive values, providing further support for the internal coherence and theoretical validity of the proposed research model. To examine the extent to which motivational orientations, attitudes, and facilitating conditions predict students' Behavioral Intention (BI) to use *ChatGPT*, a multiple regression analysis was conducted (Table 6).

Table 6. Multiple regression analysis predicting BI

Predictor	Unstandardized Coefficients		Standardized Coefficients		
	B	SE	β	t	p
Constant	0.219	0.287	—	0.763	.447
ID	0.087	0.101	0.081	0.864	.390
EGO	0.256	0.104	0.200	2.463	.016*
FC	0.055	0.082	0.060	0.672	.503
IGO	0.184	0.104	0.160	1.776	.079
ATT	0.472	0.101	0.450	4.672	< .001***

The regression model is statistically significant and explains 57.2% of the variance in the dependent variable ($R^2 = .572$, $F(5, 89) = 23.79$, $p < .001$), indicating a high level of explanatory power. Attitude toward *ChatGPT* (ATT) emerges as the strongest predictor ($\beta = .45$, $p < .001$), indicating that students' attitudes toward *ChatGPT* make the greatest contribution to their intention to use the tool for learning mathematics. Extrinsic Goal Orientation (EGO) is also found to be a significant, albeit moderate, predictor ($\beta = .20$, $p < .05$), suggesting that students who seek external validation and recognition are more likely to use *ChatGPT*. Intrinsic Goal Orientation (IGO) exhibits a trend toward statistical significance ($p = .079$), indicating that intrinsically motivated students may be somewhat more inclined to adopt new digital tools, although its effect is not sufficiently strong to reach statistical significance in the present model. In contrast, Facilitating Conditions (FC) and Individual Demand (ID) do not make statistically significant independent contributions to explaining students' behavioral intention to use *ChatGPT*.

To identify the factors that best predict students' Attitude toward *ChatGPT* (ATT), a second multiple regression analysis was performed (Table 7).

Table 7. Multiple regression analysis predicting ATT

Predictor	Unstandardized Coefficients		Standardized Coefficients		
	B	SE	β	t	p
Constant	-0.270	0.295	—	-0.915	.362
ID	0.239	0.101	0.230	2.369	.020*
EGO	0.115	0.107	0.093	1.068	.289
FC	0.265	0.080	0.301	3.304	.001**
IGO	0.300	0.103	0.273	2.916	.004**

DISCUSSION

The aim of this study was to examine how different forms of motivation, individual learning needs, and facilitating conditions influence students' attitudes toward and intention to use *ChatGPT* for learning mathematics. The findings indicate that high school students do not yet exhibit strongly positive attitudes or a high intention to use *ChatGPT* in mathematics education. Nearly half of the participants reported using the tool less than once a month, suggesting that generative artificial intelligence has not yet become an integral part of students' everyday learning. This finding may be attributed to the limited pedagogical integration of AI tools into classroom practice, teachers' relatively limited experience with their educational use, and students' reservations regarding the reliability of AI-generated responses.

Although the mean scores for both Attitude (ATT) and Behavioral Intention (BI) are below the theoretical midpoint of the five-point Likert scale, the regression analysis demonstrates that attitude is the strongest predictor of students' intention to use *ChatGPT*. This finding suggests that, despite the current limited adoption of the technology, more favorable perceptions of *ChatGPT* substantially increase students' willingness to use it for learning mathematics. These results are consistent with the findings of Egara et al. (2025), who reported that students recognize the educational potential of *ChatGPT*, particularly for understanding mathematical concepts and solving problems, while simultaneously expressing concerns regarding its accuracy, reliability, consistency, and ability to accommodate individual learning needs.

The relatively low levels of students' attitudes and behavioral intention may also be explained by the inherent limitations associated with the educational use of generative artificial intelligence. Although *ChatGPT* can provide rapid responses, multiple explanations, and personalized learning support, its outputs are not always entirely accurate, reliable, or appropriate for students' age and prior knowledge. Excessive reliance on such systems may reduce students' independence in math-

ematical problem-solving and hinder the development of critical thinking, particularly when AI-generated responses are accepted uncritically. In addition, the literature highlights ethical concerns related to academic integrity, transparency in AI use, and the responsible use of AI-generated content (Pepin et al. 2025). These challenges may contribute to students' cautious attitudes toward *ChatGPT* and help explain the relatively modest levels of acceptance observed in the present study. Consequently, *ChatGPT* should be viewed as a supplement to the instructional process rather than a replacement for teachers or students' independent learning. Nevertheless, when implemented within appropriate technical and pedagogical conditions, artificial intelligence can facilitate more individualized learning by providing detailed explanations tailored to students' abilities, psychological characteristics, learning pace, and preferred learning styles (Mandić 2024).

Beyond the importance of attitudes, the findings also underscore the role of motivational factors in the acceptance of *ChatGPT*. Intrinsic Goal Orientation (IGO) emerges as a significant predictor of students' attitudes, indicating that curiosity, interest, and a genuine desire to learn contribute to more favorable evaluations of the tool. This result is consistent with the findings of Lai et al. (2023), who emphasizes the importance of intrinsic motivation for the meaningful and active use of digital technologies in education. By contrast, Extrinsic Goal Orientation (EGO) exerts only a limited influence: it moderately increased students' intention to use *ChatGPT* but did not significantly affect their attitudes. This finding aligns with previous research suggesting that extrinsic motivation primarily predicts technology use, whereas deeper engagement and meaningful learning are driven by intrinsic motivation (Dunn, Kennedy 2019). Thus, external incentives may encourage occasional use of *ChatGPT* but appear insufficient to foster genuinely positive attitudes toward the tool.

A particularly noteworthy finding is that Extrinsic Goal Orientation (EGO) significantly predicts Behavioral Intention (BI) but not Attitude (ATT). This suggests that students may be willing to use *ChatGPT* because of anticipated external benefits, such as achieving higher grades or completing mathematical problems more efficiently; however, these incentives alone do not appear sufficient to promote positive evaluations of the tool's educational value. In other words, extrinsic motivation encourages students' intention to use *ChatGPT* but does not foster deeper appreciation of its pedagogical benefits. This pattern is consistent with Self-Determination Theory, which argues that external motivators may influence behavior in the short term but have limited impact on deeper cognitive engagement and internalized motivation (Liu, Lin 2010).

In addition to motivational factors, Individual Demand (ID) also plays a significant role. Students reported more positive attitudes when they perceived that *ChatGPT* could personalize explanations and adapt instructional content to their individual needs and level of mathematical knowledge. This finding is consistent with previous research emphasizing the importance of personalization in AI-

supported learning (Guetala et al. 2024). It is particularly relevant in mathematics education, where students often differ considerably in prior knowledge and learning pace. The results therefore suggest that personalization represents one of the key determinants of *ChatGPT* acceptance, as students place greater value on tools capable of addressing their individual learning requirements.

One of the most important findings concerns the role of Facilitating Conditions (FC), which emerges as the strongest predictor of students' attitudes toward *ChatGPT*. This indicates that access to adequate technological infrastructure, internet connectivity, and technical support constitutes a fundamental prerequisite for the successful adoption of *ChatGPT* in mathematics education. This finding is consistent with previous research conducted in Serbia (Mandić 2023), which identifies limited digital infrastructure in schools as one of the principal barriers to the broader integration of digital technologies into educational practice.

Overall, the findings indicate that high school students' acceptance of *ChatGPT* depends not merely on the availability of technology but on the complex interaction of attitudes, motivational factors, personalization, and facilitating conditions. Although students currently report relatively limited use of *ChatGPT* and only moderately positive attitudes toward its educational application, more favorable evaluations of the tool significantly increase their intention to use it in the future. These findings suggest that the successful integration of generative artificial intelligence into mathematics education requires not only adequate technological infrastructure but also carefully designed pedagogical approaches that enable students to recognize its educational benefits while critically evaluating its limitations.

PRACTICAL IMPLICATIONS

The findings have several important implications for educational practice. First, fostering positive student attitudes appears essential for promoting the acceptance of *ChatGPT* in mathematics education. Teachers should encourage intrinsic motivation by designing intellectually stimulating mathematical tasks that promote curiosity, exploration, and deep learning rather than relying primarily on external rewards. *ChatGPT* should be used to support independent inquiry and conceptual understanding, allowing students to play an active role in constructing knowledge rather than merely receiving ready-made answers.

Furthermore, encouraging reflection and critical thinking can enhance *ChatGPT*'s value as a learning partner. The effective and responsible integration of generative AI requires adequate technological and pedagogical conditions, including reliable internet access, the development of students' digital literacy, and clear ethical guidelines for AI use. At the same time, teachers should continue developing their own digital and pedagogical competencies to ensure that *ChatGPT* is

integrated into mathematics instruction in pedagogically meaningful, purposeful, and well-supervised ways.

LIMITATIONS AND FUTURE RESEARCH

Several limitations should be considered when interpreting the findings of this study. First, the sample consisted of students from only one Serbian high school ($N = 99$), limiting the generalizability of the findings to students from different school types, educational profiles, and geographical regions. Second, the study relied exclusively on self-report measures, which may be susceptible to response biases, including social desirability bias. Third, the cross-sectional design precludes causal inferences and allows only the identification of associations among the examined variables.

Future research should therefore include larger and more diverse samples representing different school types and educational levels. It would also be valuable to investigate potential differences in students' attitudes and behavioral intentions according to mathematics accomplishments, digital competence, and frequency of generative AI use. In addition, qualitative methods, such as focus groups or student reflective interviews, could provide deeper insights into students' experiences and challenges associated with the educational use of *ChatGPT*.

Finally, intervention-based and longitudinal studies are needed to examine the long-term effects of pedagogical approaches to integrating generative artificial intelligence on students' motivation, self-regulated learning, and academic achievement. Such research would contribute to a more comprehensive and robust understanding of the role of generative AI in mathematics education.

CONCLUSION

The findings of this study indicate that, although high school students do not yet exhibit strongly positive attitudes or a high intention to use *ChatGPT* for learning mathematics, their acceptance of *ChatGPT* as a learning support tool depends primarily on their attitudes, intrinsic motivation, and the availability of facilitating conditions. Attitude toward *ChatGPT* emerged as the strongest predictor of students' intention to use the tool, while Intrinsic Goal Orientation and Facilitating Conditions were identified as the key determinants of positive attitudes. These results suggest that the successful integration of generative AI into mathematics education depends not primarily on the technology itself, but rather on how students perceive it and the conditions under which they use it.

This study contributes to a better understanding of the factors shaping students' willingness to adopt emerging technologies in the context of mathematics

learning. It also provides a foundation for developing pedagogical approaches that foster student motivation, digital literacy, and the responsible use of artificial intelligence in education.

Although the study was limited to a single high school, the findings offer valuable insights into how generative artificial intelligence can be constructively integrated as a support tool for mathematics learning. They may also serve as a basis for designing pedagogical strategies that promote the meaningful, effective, and responsible implementation of generative AI in mathematics education.

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СТАВОВИ УЧЕНИКА ГИМНАЗИЈЕ О *CHATGPT*-У КАО ПОДРШЦИ У УЧЕЊУ МАТЕМАТИКЕ

Айсиџпракџи: Генеративна вештачка интелигенција се све више препознаје као значајно средство за подршку процесима учења. Циљ овог истраживања био је да се испитају ставови ученика гимназије о коришћењу *ChatGPT*-а као подршке учењу математике, са фокусом на улогу мотивационих оријентација, индивидуалних потреба и услова коришћења у обликовању њихових ставова и намере употребе овог алата. Истраживање је спроведено на узорку од 99 ученика једне гимназије у Србији, применом упитника заснованог на интеграцији модела прихватања технологије и мотивационог модела саморегулисаног учења. Резултати истраживачке факторске анализе указали су на постојање шест латентних димензија: ставови према коришћењу *ChatGPT*-а, намера коришћења, унутрашња и спољашња оријентација ка циљу, индивидуалне потребе ученика и олакшавајући услови. Налази регресионе анализе показују да ставови ученика имају кључну улогу у формирању намере употребе *ChatGPT*-а, док унутрашња мотивација, индивидуалне потребе и олакшавајући услови значајно доприносе развоју позитивних ставова. Добијени резултати указују на значај педагошких и мотивационих услова за смислену и одговорну примену генеративне вештачке интелигенције у настави математике.

Кључне речи: *ChatGPT*, генеративна вештачка интелигенција, настава математике, мотивација ученика, ставови ученика.