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Autonomy support as a predictor of student engagement in higher education

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Abstract

Teacher autonomy support is defined as teacher's instructional effort to identify and strengthen students' internal motivational resources and autonomy. Furthermore, the study made use of concept of student engagement, which is a multidimensional construct that represents the interaction between the individual and the context. Students tend to show higher levels of engagement when they perceive that teachers support their autonomy. In consequence, the primary objective of this paper is to ascertain the role of perceived autonomy support as a predictor of university students' academic engagement. A probabilistic sample of 601 students from a public university in Ecuador participated in correlational-explanatory research, which entailed the completion of two questionnaires. The data analysis included hierarchical multiple linear regression analysis. The principal result shows that the greater the teachers' support for autonomy, the higher the levels of student engagement. Therefore, is possible to conclude that autonomy support is a significant predictor of student engagement. This suggests that learning climates and strategies which foster student autonomy should be prioritised over more controlling climates and strategies.

Keywords

student engagement; autonomy support; self-determination theory; higher education.

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Apoyo a la autonomía como factor predictivo del compromiso estudiantil en la enseñanza superior

Resumen

El apoyo a la autonomía del profesor se refiere al esfuerzo instruccional del profesorado para identificar y fortalecer los recursos de motivación interna y autonomía del alumnado. Mientras que el compromiso estudiantil es un constructo multidimensional que representa la interacción entre el individuo y su contexto. Cuando los estudiantes perciben que el profesorado apoya su autonomía, tienden a mostrar un mayor nivel de compromiso. En consecuencia, el objetivo principal del presente trabajo se concentra en determinar el apoyo a la autonomía percibida como un factor predictor del compromiso académico del alumnado universitario. Una muestra probabilística de 601 estudiantes de una universidad pública de Ecuador participó en la investigación correlacional-explicativa, que supuso la cumplimentación de dos cuestionarios. El análisis de datos incluyó un análisis de regresión lineal múltiple jerárquica. El resultado principal muestra que, cuanto mayor es el apoyo de los profesores a la autonomía, mayores son los niveles de compromiso de los estudiantes. Por tanto, se puede concluir que el apoyo a la autonomía es un predictor significativo del compromiso estudiantil. Esto sugiere que los climas y las estrategias de aprendizaje que fomentan la autonomía de los alumnos deberían priorizarse sobre los climas y las estrategias más controladores.

Palabras clave

Compromiso estudiantil; apoyo a la autonomía; teoría autodeterminación; educación superior.

Introduction

According to self-determination theory (SDT), most human beings demonstrate effort, initiative, and engagement in their lives, while at the same time, people can reject growth and responsibility. SDT has also indicated contextual factors that may limit the achievement of basic psychological needs and general wellbeing (Ryan & Deci, 2000). Reviewing the postulates and principles of SDT is an interesting, although considerable task. It can be summarized as a macro-motivational theory of the basic psychological needs that are fundamental for any individual (Jaramillo, 2021; Stover et al., 2017).

The theory creators, Ryan & Deci (2000), suggested that there were three innate psychological needs in human beings—competence, autonomy, and relatedness—that once met, promote self-motivation, wellbeing, and mental health. They analysed the importance of these basic psychological needs in areas such as health, education and psychotherapy. The present study focuses on one of those three needs, autonomy. Ryan & Deci (2017) defined autonomy as the regulation of behaviour by the self and etymologically it refers to self-regulation. The concept is linked to the problem of integration and to feelings of vitality and experiences of fulfilment. This need is not a synonym of independence, and they noted that the opposite of autonomy is heteronomy.

The need for autonomy has particular status within the three basic psychological needs. This is because it is through self-regulation of behaviour that people manage to satisfy other needs (physical and psychological) and because it is a vehicle that helps in organization of the personality (Ryan & Deci, 2017). Autonomy involves the individual deciding what actions they will undertake, then doing them, such that they have some control over the consequences, increasing their competence. And as competence increases in a given activity,

autonomy also increases (Stover et al., 2017). Reeve (2016) defines teacher autonomy support as a teacher's instructional effort to provide students with classroom environments and teacher-student relationships that support student autonomy. The term refers to the interpersonal feelings and behaviours that teachers provide during instruction to both identify, vitalise and strengthen students' internal motivational resources.

The educational implications of SDT, and specifically of autonomy support, have been demonstrated in many studies in the field of education at various levels. One of the many variables that can predict students' satisfaction is teachers' support for autonomy, which is also a mediating variable for the satisfaction of basic psychological needs (Gutiérrez & Tomás, 2018). It also indirectly affects school satisfaction and academic performance.

Encouraging autonomy is therefore a key factor in promoting student wellbeing. Research on this topic has shown that there is a positive correlation between support for autonomy provided by teachers and basic psychological needs being met and has allowed positive links to be identified between this support for autonomy and university students' academic satisfaction (Tomás & Gutiérrez, 2019). Teachers and their educational activities can support or restrict autonomy, and students do perceive this, as indicated in the findings from Leenknecht et al. (2017), who noted that students think that teachers who support autonomy are engaged and provide structure.

Student engagement as a construct is interesting because universities have to try to tailor their educational processes in response to quality standards. In this regard, student engagement represents added value in the process of assuring quality, as it provides relevant information about students' experiences and learning (Aspeé et al., 2018). Lowe & Hakim (2020) noted that the ideas and studies related to student engagement were not a modern phenomenon. They noted that the concept had already been addressed by Dewey in his theory of "Democratic Education". In any case, Fredricks et al. (2004) stressed the importance of student engagement as it helped tackle low levels of academic achievement and reduce high rates of disinterest and student drop-out. Student engagement is often understood as a synonym of motivation, but despite being related, it is a different construct. Reeve (2012) noted that student engagement is the expression of a students' level of participation during a learning activity, whereas motivation refers to any effort aimed at behaviour.

Autonomy support and student engagement

According to Fredricks et al. (2004), student engagement is defined as a multidimensional construct (behavioural, emotional, and cognitive engagement) and as an interaction between an individual and their context that allows better understanding of the complexity of students' experiences. Behavioural engagement refers to doing the work and following the rules; emotional engagement is about interests, values, and emotions whereas cognitive engagement includes motivation, effort, and strategy use. Data about student engagement provides an index related to the extent to which students are doing the types of things that will probably produce learning results. As a consequence, student engagement provides necessary information about students' learning (Coates, 2005).

Other results, such as from Minaye et al. (2024), suggest that student engagement varies based on certain student characteristics, such as gender, knowledge area, and place of origin (rural or urban). In addition, according to the results reported by Aspeé et al. (2018), factors such as students' academic history and parental educational attainment do not make a difference to academic engagement. However, socio-economic background does determine some differences in how university students engage with their activities.

The relationship between autonomy support and student engagement in the university context has been widely documented (Ferrer et al., 2022; Moreno-Murcia et al., 2022; Núñez & León, 2019; Wang, 2024). Previous studies have shown that when students perceive support for their autonomy from teachers, they tend to exhibit higher levels of student engagement. This direct influence of perceived autonomy support on student engagement led to the recommendation that higher education institutions should consider training plans for teachers based on supporting student autonomy that would encourage teachers to provide classroom environments that would demonstrate this support (Han & Huang, 2022). Other studies have suggested that autonomy support encourages students to set self-directed goals rather than adopting goals set by teachers (Benlahcene et al., 2020).

Having teachers who support autonomy encourages students' intrinsic motivation, which is directly associated with their learning results, and indirectly associated with study effort (Torbergsen et al., 2023). The study by Gutiérrez et al. (2018) produced results showing a positive effect of teachers' autonomy support on student engagement, although it concluded that that the effect of these two variables may be reciprocal. Both variables were also shown to be potent predictors of students' satisfaction with their university.

Okada (2021) highlighted two issues about the relationship between perceived autonomy and academic engagement. On the one hand, it emphasized engagement as a concept that reflected students' motivation, and on the other, it indicated the positive relationship between autonomy support and the three types of student engagement. This association is clear when students who perceive their teachers' support for autonomy tend to actively involve themselves in learning situations.

When students are in settings where they feel that teachers support their autonomy, they tend to exhibit greater student engagement and better academic performance (Núñez & León, 2019). According to Reeve & Cheon (2021), greater satisfaction with autonomy improves students' adaptive functioning in the classroom and is associated with better adjustment in terms of engagement, learning, and psychological wellbeing. Díaz-Noguera et al. (2022), suggest that university student autonomy is a key factor in enhancing learning performance and adaptability.

The present study took place in a Latin American context, more specifically in Ecuador, where higher education is made up of universities, polytechnic schools, higher technical colleges, technical colleges, art colleges, and higher conservatories, both public and private. Public universities are funded through the general state budget (Higher Education Act [Reglamento a la Ley Orgánica de Educación Superior] (Reglamento a la Ley Orgánica de Educación Superior [LOES], 2022) Ramírez (coord.), (2012) noted that since 2008 there have been calls for Ecuadorian public universities to begin a process of transformation, in part because for the previous ten years they had not been critical social actors of the university system itself or the structural problems of Ecuadorian society.

Based on all of this, autonomy support, along with gender, academic year, parents' educational attainment, and parents' income, is considered independent variable. Academic engagement is analysed as the dependent variable to determine factors that most significantly predict student engagement in a sample of university students.

The main objective of the current study was to determine the effect of students' perceived autonomy support from teachers as a predictive factor for their student engagement. In addition, a secondary objective was to determine whether there were differences in student engagement and perceived autonomy by gender and family socio-economic background and to assess how important any differences were

Method

Participants

The present study adopted a non-experimental quantitative correlational-explanatory approach, and was conducted at a public university in Cuenca, Ecuador. At the time of collecting data, there were 14576 students enrolled in its 12 faculties, grouped into four knowledge areas. The sample size was calculated using Cochran's (1977) formula for finite populations, with a 98% confidence level and 5% margin of error. The recommended sample size was 524 students. This was increased by 21% to ensure a suitable sample size in the case of missing data or responses, meaning a final sample of 635 students. A stratified probably sampling with proportional allocation was utilised to select the students. The four strata correspond to each knowledge area. The initial sample and final sample, in addition to the proportions of each, are detailed in Table 1.

Table 1.
Stratified sample size distribution

Strata	**Proportion Population**	**Initial Sample**	**Final Sample**	**Proportion sample**
Social Sciences, Journalism, Information and Law, Administration and Services	25.8	164	120	20
Education, Arts and Humanities	17.0	108	121	20.1
Engineering, Technology, Architecture, and Farming	29.9	190	97	16.1
Human Health and Wellbeing	27.3	173	263	43.8
Total	100	635	601	100

The students were between 18 and 39 years old, with a mean age of 21.07 years and S.D of 2.55. Just under a third (31.4%) were men, 67.6% were women, and 1% did not specify. Participants were asked about their parents' incomes and educational attainment (Table 2). Similar numbers of fathers had only completed basic education (up to 14 years old) (33.1%) and upper secondary education (up to 17 years old) (33.3%). A slightly higher proportion of mothers had attained upper secondary education (38.4%). In terms of income, a little over a third of students indicated that their parents earned less than the unified basic salary, equivalent to $460 a month.

Table 2.
Demographic characteristics of the participating sample

Father's educational attainment	Frequency	% total
Basic[a]	196	33.1 %
Upper secondary	197	33.3 %
Graduate	150	25.3 %
Post-graduate	49	8.3 %
Mother's educational attainment	Frequency	% total
Basic	179	29.8 %
Upper secondary	231	38.4 %
Graduate	154	25.6 %
Post-graduate	37	6.2 %
Income	Frequency	% total
Less than NMW[b]	217	36.1 %

More than NMW	316	52.6 %
More than twice NMW	68	11.3 %

a=the classification of fathers' and mothers' educational attainment is in accordance with the standards set forth by the UNESCO. Therefore, the designation of "Basic" corresponds to the International Standard Classification of Education (ISCED) levels 1 and 2, "Upper secondary" aligns with level 3, "Graduate" is equivalent to level 6, and "post-graduate" corresponds to level 7 (UNESCO Institute for Statistics, 2012, 2021). b=NMW=National Minimum Wage.

Instruments

Data was collected via a form for sociodemographic information and two questionnaires. The first questionnaire was the University Student Engagement Inventory (USEI) (Maroco et al., 2016), used to assess the students' levels of student engagement. It has 15 items in three dimensions: behavioural engagement, emotional engagement, and cognitive engagement. It has adequate reliability, with Cronbach α for the overall scale = 0.815 and McDonald's ω = 0.848.

The second questionnaire was the short form of the Learning Climate Questionnaire (LCQ), developed by Williams and Deci (1996). The six questions it contains ask about support for autonomy from teachers. Perceived autonomy is assessed on a Likert-type scale from 1 to 7. The questionnaire has adequate reliability, Cronbach α = 0.937 and McDonald's ω = 0.932.

Procedure

Approval from the university was sought for the study, which would be done by sending students a link to an online version of the instrument or applying it in classrooms. The online questionnaire used the QuestionPro application. Data was collected between September 2022 and February 2023. Before completing the instruments, students were given information about the study objectives and methodology and signed their informed consent. The study was approved by the University of Oviedo Research Ethics Committee.

Data analysis

The data analysis encompassed descriptive statistics, including frequency, percentage, mean and median. Given the non-normal distribution of the data, Mann-Whitney U and Kruskall-Wallis tests were employed for the purpose of comparison. Furthermore, the effect size was calculated by means rank-biserial correlation and epsilon squared, respectively. Hierarchical multiple linear regression analysis was performed. This statistical technique allows measurement of the contribution of each group of variables (model) to the explanation of the variance (R2). Calculations were done using JAMOVI (2022) software and R Core Team (2021), using the regression package from Fox & Weisberg (2020). Plot was created by emmmeans using R package (Lenth, 2023).

The first step was to apply the Shapiro-Wilk tests for normality and examine Q-Q plots for residuals to determine whether the data complied. The following tests were used to assess model quality: Cook's distance, which assesses whether there are atypical values that might bias the model; the Durbin-Watson test, to assess auto-correlation; and the VIF measure of variance inflation to estimate collinearity (Kutner et al., 2005).

Results

The results are given below, first the basic descriptive statistics for each variable, then the results of the multivariate hierarchical regression models.

Overall student engagement and engagement dimensions

The overall scores from the engagement scale and the scores from the different dimensions showed that the participants tended to have high levels of student engagement, particularly in the behavioural and cognitive engagement dimensions (Table 3). Students with higher levels of behavioural engagement follow rules and complete their academic tasks. Higher levels of cognitive engagement relate to regulation and integration of learning. There was not such a high level in the emotional engagement dimension, which was between low and neutral, indicating less engagement in terms of feeling at ease at university and a sense of belonging to the institution. The values for Shapiro-Wilk W indicate that the variables did not follow a normal distribution.

Table 3.
Descriptive statistics for levels of student engagement by dimension and overall

	Behavioural engagement	Emotional engagement	Cognitive engagement	Overall student engagement
N	601	601	601	601
Mean	3.99	3.45	4.00	3.81
Median	4.00	3.40	4.00	3.87
SD	0.602	0.616	0.718	0.52
Minimum	2.20	1.00	1.80	2.20
Maximum	5.00	5.00	5.00	5.00
Shapiro-Wilk W	0.970	0.986	0.950	0.989
p-value	< .001	< .001	< .001	< .001

Perceived Autonomy support by students

Perceived autonomy had scores from 1 to 7. In general, students indicated moderate levels of support for autonomy form their university teachers (Table 4). The SD (1.40) indicates that although the data were mostly concentrated around the mean, there was moderate variability in the responses.

Table 4.
Descriptive statistics for level of perceived autonomy

	N	Mean	Median	SD	Minimum	Maximum
Autonomy support	601	4.66	4.83	1.40	1.00	7.00

Level of student engagement and perceived autonomy by gender and parental income

Men and women gave similar scores for student engagement and teachers' autonomy support, and there were no statistically significant gender differences in student engagement or in perceived autonomy ($p>0.05$). The effect size was determined using the rank-biserial correlation method. (Table 5).

Differences in student engagement and autonomy support by participants' parental income

There were significant differences for at least one group comparing student engagement between the three groups of parental income ($p<0.05$ in the Kruskal-Walli's test) although the size of the difference was small (Table 6). There were no differences in autonomy ($p > 0.05$). Groups were compared pairwise using Dwass-Steel-Critchlow-Fligner comparisons.

There were no differences between the lower income group and the middle-income group, but there were differences in student engagement between the lowest and highest income groups.

Table 5.
Differences in students´ engagement and autonomy support by participant gender

Variable	Gender	N	Mean	Median	DE	Min.	Max.	Mann-Whitney U	p	Effect size
Student Engagement	Male	189	3.82	3.87	0.520	2.33	4.93	37875	0.801	0.0128
	Female	406	3.81	3.87	0.526	2.20	5.00			
Autonomy support	Male	189	4.80	4.83	1.408	1.33	7.00	34699	0.060	0.0956
	Female	406	4.59	4.67	1.394	1.00	7.00			

Table 6.
Differences in student engagement and perceived autonomy by parental income

	χ^2	df	p	ε^{2a}
Student engagement	10.14	2	0.006	0.01690
Autonomy support	4.67	2	0.097	0.00779
Pairwise comparisons for student engagement			**W[b]**	**p**
Less than NMW	More than NMW		2.80	0.117
Less than NMW	More than twice NMW		4.33	0.006
More than NMW	More than twice NMW		2.63	0.151
Pairwise comparisons for perceived autonomy			**W**	**p**
Less than NMW	More than NMW		0.574	0.913
Less than NMW	More than twice NMW		2.951	0.093
More than NMW	More than twice NMW		2.774	0.122

a= ε^2= effect size b= Kruskal-Wallis

Hierarchical multiple linear regression analysis

Cook's distances applied to each model indicated that there were no atypical values. The Durbin-Watson test gave values close to 2, with p>0.05, indicating that there was no autocorrelation in the model residuals. All VIF values were below 2, indicating the absence of collinearity. Lastly, the Shapiro-Wilk test for normality produced significant values suggesting a lack of perfect normality (p=0.028 for model 4). However, in a sample as large as this it is quite common to have an issue of this type. On analysing the Q-Q plots, there appeared to be a reasonable approximation to normality, as each one followed the reference line closely, with minor deviations in the extremes.

Table 7 shows the results of the hierarchical linear regression model. The first model made no significant contribution, in other words, the students' gender did not affect student engagement. The second model included the students' academic year in addition to gender. This improved the fit of the model, which explained at least 1% of the variance. Although this is a small percentage, it suggests that as students' progress through university, their student engagement improves. The third model added parental education and income. Although

none of the predictors were statistically significant, this combination of variables improved the model fit, explaining 3.5% of the variance. A low percentage, but suggesting that the greater the parents' educational attainment, and more importantly the income in the home (p=.082), the better their children's engagement at university. Finally, the model added the variable LCQ. This produced a substantial improvement in fit, as this model explained 32% of the variance. This is a significant contribution, indicating that the greater the teachers' support for autonomy, the higher the levels of student engagement.

Table 7.

Standardized estimators for the multivariate hierarchical regression models

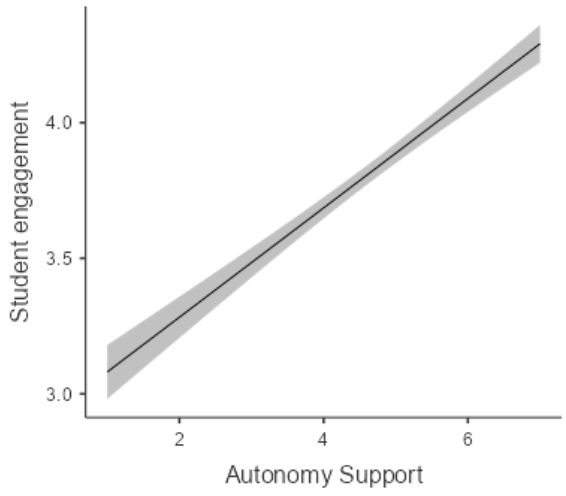
Predictors	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Gender	-0.0121	0.0052	0.0079	0.0424
Academic year		0.1059*	0.0674	0.0427
Fathers' educational attainment			0.0470	0.0856
Mothers' educational attainment			0.0658	0.0227
Parental income			0.0830	0.0475
Autonomy support				**0.5394*** **
R^2	0,0001	0.0111	0.0351	0.3209
F	0.0862	3.2655*	4.2229***	45.6023***
ΔR^2		0.0109	0.0240	0.2858
Comparative F		6.44*	4.82**	243.66***

*p<0.05; **p<0.010; ***p<0.001

Figure 1 shows the relationship between student engagement and autonomy support (as one increases, so does the other) with a high level of confidence indicated by the thin grey zone around the main line.

Figure 1.

Relationship between student engagement and perceived autonomy support marginal mean measures with 95% confidence



Discussion and conclusions

The study focused on identifying autonomy support as a predictor of student engagement. The results confirm what previous studies have reported. They indicate that when students characterize the learning climate as having high levels of support for autonomy from the teachers, the levels of student engagement are also high. In other words, support for autonomy is a notable predictor of student involvement in learning activities. The results are consistent with findings showing that when students perceive that their teachers support their autonomy, they tend to have better academic results and involve themselves more in learning situations (Núñez & León, 2019; Okada, 2021), or that students exhibit better adjustment in terms of engagement and learning (Reeve & Cheon, 2021). The model shows that when the autonomy support variable is involved, student engagement tends to be higher, which reinforces the idea that the support teachers provide encourages more autonomous motivation, initiative, and engagement (Ryan & Deci, 2020). This highlights the need to create classroom situations that are less controlling and restrictive.

According to the results of the present study, participants' gender does not make a difference to overall student engagement, any of its dimensions, or perceived autonomy. This contrasts with Bru et al. (2021), who reported gender differences in students' engagement and perceived autonomy. In addition, neither parental educational attainment nor income were sound predictive factors for student engagement, although income was associated with some differences in scores in student engagement, especially in the highest and lowest income groups. These results suggest that a family's economic situation could affect academic activities, even more so if we consider the economic and social situations in the Ecuadorian context. The differences in student engagement related to income are similar to those reported by Aspeé et al. (2018), who highlighted socio-economic background as a differentiating factor in evaluating student engagement.

Along similar lines, looking at the dimensions making up student engagement, the lowest scores were in emotional engagement, while the highest were in the cognitive dimension. However, it is worth clarifying that cognitive engagement may cover many things, from memorization of subject content to the use of self-regulated learning strategies to achieve understanding or mastery in a given topic, whereas emotional engagement is linked to positive or negative reactions to teachers or students and the sense of belonging at the institution (Fredricks et al., 2004). In this regard, although overall student engagement was stronger when students perceived autonomy support from their teachers, it is worth noting that these variations in the student engagement dimensions may be because teachers are using autonomy support strategies and controlling teaching strategies at the same time (Reeve, 2016).

Given the results, we can conclude that a high level of support for autonomy from the teachers predicts greater levels of student engagement. Autonomy support is a significant predictor of student engagement. This suggests that learning climates and strategies which foster student autonomy should be prioritises over more controlling climates and strategies. The provision of autonomy support has been demonstrated to be an effective catalyst for student engagement. It follows, therefore, that teachers must be willing to adopt new approaches and seek out alternatives to actively involve their students.

Although the students' perceptions of autonomy support in this study were relatively high, it is worth thinking about the teaching styles that teachers use in the different knowledge areas. In addition, although the findings indicate that factors such as gender, parental income, academic year, and parental educational attainment did not predict the level of student engagement, they are variables that are necessary when it comes to analysing

complex constructs such as student engagement and autonomy support, particularly in contexts characterised by significant social and economic disparity, as is the case in Ecuador.

The findings from this study suggest that the teachers must devise programmes and strategies that are underpinned by autonomy-support strategies. This will help students develop professional skills, as well as helping them to solve problems and make decisions autonomously, critically, and responsibly. It is vital that programs designed to train and develop future professionals are implemented within learning climates that foster a sense of autonomy, enabling students to initiate and complete tasks, which means they need to be able to try, fail, and express their questions and reasoning without fear of being held to traditional standards (Granero-Gallegos & Carrasco, 2020). In addition, given the crucial role of autonomy support, it is imperative that the university implements mentoring programmes to achieve student-centred teaching. If the academic year has a moderate influence (as shown in the second model) it may be relevant to explore mechanisms for the satisfaction of autonomy needs in the early years. Finally, it is also important to note that there were differences in the proportions of the sample involved in the study due to differences in the response rates, which were taken into consideration when interpreting the results.

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