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Mapping the association between productive immunity, emotion regulation, resilience, and autonomy in higher education

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Abstract

In recent years, more attention has been paid to the psychological and physical well-being of educators. Nevertheless, inadequate attention has been paid to the mediator function of teacher immunity (TI), teacher emotion regulation (TER), teacher resilience (TR), and teacher autonomy (TA) in higher education. This study developed a model to demonstrate the interplay between TI, TER, TR, and TA in an effort to solve the existing research gap. To compile this information, 492 university academics who are currently working in the position of English as a foreign language teacher at various universities throughout Iran have participated in an online survey. They were asked to express their opinions with respect to four instruments: the language teacher immunity instrument, the language teacher emotion regulation inventory, the teacher resilience scale, and the teacher autonomy questionnaire. Confirmatory factor analysis and structural equation modelling indicated that university professors who developed productive immunity and emotion regulation are more resilient and autonomous. In conclusion, the implications as well as the future direction of the study were presented to enthusiastic researchers as well as educators. This can help increase the researchers' and educators' understanding of the connection between TI, TER, TR, and TA and how it can produce positive results for students.

Keywords: Teacher immunity, Emotion regulation, Resilience, Autonomy, Higher education

Introduction

Teaching in higher education is inherently complicated since it involves a wide variety of variables that are both personal and environmental. It is dependent on how language instructors see themselves, as well as the methods that they use to instruct their students. In most cases, they come up with a variety of approaches to teaching, which is often the result of the interaction between their personal and professional aspects (Frenzel et al., 2021). The act of teaching is inextricably linked to a variety of emotional experiences, and many educators are of the opinion that instructors who successfully manage

their emotions while doing their job are more successful (Buric et al., 2017). According to Chang and Taxer (2020), TER refers to a professor's capacity to control and regulate their own emotional experiences and expressions. TER equips teachers with the ability to vary the strength and length of their emotional experiences in the workplace (Heydarnejad et al., 2021; Li et al., 2022). These changes have major consequences for teachers' ability to express their efficacy. TER, especially emotion regulation in higher education, is nonetheless in its immaturity, and it requires significant study (Alipour et al., 2021; Namaziandost et al., 2022).

According to Hiver and Dörnyei (2017) and Rahmati et al. (2019), the recently conceived idea of language teacher immunity functions as a protective mechanism against a variety of limitations that are inherent to the field of language instruction. The immunity granted to language teachers may serve as a barrier to insulate university instructors from the strong turbulence and the intricacies of various educational environments. From a survey of the limited research on language teachers' immunity, we learn that it's strongly linked with teacher-related beneficial variables (e.g., Hiver, 2017; Li, et al., 2022; Namaziandost et al., 2022). But so far, there is a lack of published material regarding language teacher immunity, particularly in higher education, which calls for more extensive research to study varying facets of this phenomenon.

In a constantly demanding atmosphere for university professors, teacher resilience (TR) supports in overcoming language teaching problems and boosting learning environment (Mansfield et al., 2018). TR refers to teachers' capacity to successfully handle adversities, hurdles, difficulties, and hardship in an educational context (Mullen et al., 2021). Developing TR involves a positive perspective, a will to progress, and the capacity to gain insight from setbacks. The other construct which is the target of the present research is TA which refers to their influence over their curriculum, assessment, classroom management, and classroom setting (Lacaba et al., 2020). According to Daniilidou and Platsidou (2018), TA addresses the teacher's competence and accountability in determining his own teaching approach. Towards the best of the investigator's knowledge, up to present, no study has investigated these theoretically connected components under a unified model to expose the way they are related with one another and subsequently, whether they impact university professors' performance. Thus, further study is required to fulfill this need.

Literature review

As used in the context of biology, the word "immunity" refers to a protective system that stimulates the body's immune antibodies and blocks infection via a series of chemical reactions (Janeway et al., 2005). According to Hiver (2015), TI serves as a preventative and responsive method for dealing with a wide range of pedagogical challenges. In other words, TI is a balance between the positive factors of a strong motivation to teach, positive mental health, and a willingness to adapt to new situations and challenges, and the negative factors of high educational obligations, exhaustion, and disengagement (Hiver & Dörnyei, 2017). Taking into account a small subset of the literature on the subject of teacher immunity suggests that the conception of this novel idea may have evolved from self-organization theory, an aspect of complexity theory (Larsen-Freeman, 2012). The term "self-organization" is used to describe the way in which a dynamic system's overall

function evolves as a consequence of connections among the many parts that make it up (Larsen-Freeman, 2012).

There are two main ways in which a language teacher's immunity might show itself when faced with adversity: productive and maladaptive. To put it simply, apathy, conservatism, cynicism, and reluctance to change all stem from maladaptive immunity, which has a biological analogue (Hiver, 2015; Hiver & Dörnyei, 2017). The productive immunity, is the source of feelings like optimism, dedication, excitement, resilience, and motivation. The opposite, maladaptive immunity, has a biological analogue that works in a similar way. TI, resembling biological immunity, functions as a defensive and protective response in a crisis, it enables educators to increase the effectiveness of their instruction. It helps instructors cultivate their professional identities, which will protect them against attacks in the future. In addition, Hiver and Dörnyei (2017) highlighted the crucial role of the individual's identity, as well as their way of thinking and behaving in social conditions, in both the development and the operation of the immune response to the instructor.

Recent attention on TI was quite rosy. For instance, Hiver (2015) carried up a groundbreaking study in which they investigated the self-concepts of four L2 teachers who worked in a number of different fields and assessed the consistency of their motivation. He was able to recognize several various aspects of TI by making use of this case study. Some of these characteristics include burnout, attrition, readiness to adapt, teaching effectiveness, and motivation. Moreover, Haseli Songhori et al. (2018) evinced that maladaptive immunity was found to be the most common kind of immunity among Iranian English teachers, as shown by the mean scores attained by their pupils, in accordance with the findings of the researchers. Using a path-analysis method, Rahimpour et al. (2020) constructed a model on the factors that predict language teacher immunity. They discovered that openness to experience, assertiveness, and emotional control had an indirect impact on language teacher immunity through job insecurity and reflective teaching. This was the pathway through which these factors worked. According to the findings of Li et al. (2022), it is possible to create reliable predictions about the presence or absence of TI through the combination of cognitive and emotional qualities. Furthermore, a model on the factors that predict language instructor immunity was proposed by Namaziandost et al. (2022). As their conclusion, they arrived at the verdict that reflective teaching and ER are necessary parts in the process of defining TI.

Emotion regulation (ER) is defined as a system that incorporates cognitive, behavioral, and physiological components and is utilized to successfully modify emotional states (Gross & John, 2003). ER is not a frozen point in time but rather a dynamic process that influences and drives the ways in which people feel or express their emotions (Gross, 1998). ER alters not only the onset, but also the duration and postponement of emotional responses, in addition to mental, psychological, and physiological processes (Taxer & Gross, 2018). More specifically ER is considered explicit when emotional regulation occurs in the context of consciousness. ER is present even though the management of emotions takes place unknowingly (Richards, 2022).

Both instructors and students are confronted with a variety of problems within academic settings, and these obstacles have the potential to elicit both positive and negative feelings. Establishing a positive emotional environment allows teachers to more

effectively control not just their own emotions but also those of their pupils (Chang & Taxer, 2020). In attempt to explain language TER, Heydarnejad et al. (2021) developed a model with six different dimensions: Situation selection, Situation modification, Attention deployment, Reappraisal, Suppression, and Seeking social support. The first three dimensions of the model were developed in accordance with Gross' process model of ER (1998, 1999, 2014). To develop the reappraisal and suppression dimensions, they used the findings that Gross and John (2003). The final dimension, seeking social support, they made use of the findings that Jennings and Greenberg (2009) as well as Taxer and Gross (2018).

It appears that there is a paucity of research on university TER. Some studies on TER that was carried out shed light on its connections to other of teacher-attributed factors. As an illustration, Chang (2020) investigated the connection between teachers' feelings of burnout, their beliefs about the appropriate rules for displaying emotions in the classroom, and the attitudes they hold toward ER strategies. According to the analysis of the data, ER were a contributing factor in expressive suppression and burnout. Th the same vein, Fathi et al. (2021) investigated the relationship between TER, reflectivity, efficacy beliefs, and burnout. Based on their results, TER would act as a mediator between the influences of reflectivity and efficacy beliefs on EFL teachers' burnout. Furthermore, Deng et al. (2022) evinced that TER has direct relationships with self-efficacy, engagement and control of anger among EFL teachers. Namaziandost et al. (2023) conducted research not too long ago in which they came to the conclusion that TER and higher order thinking abilities play a moderator function in language instructors' engagement at work.

The capacity to withstand the inevitable pressures and adversities inherent in teaching as a demanding job is referred to as resilience, and it is of the utmost significance in all academic settings due to the fact that it can yield a wide variety of beneficial results. Beltman (2021) asserts that the concept of resilience may be construed in four distinct ways. The first method of thinking about resilience takes a person-centered approach and regards it as a trait of a person that becomes visible when they are confronted with adversity. The second way to think about resilience is known as the process emphasis or the person-context viewpoint. According to this line of thought, resilience is seen as the result of interaction between a person and the environment in which they find themselves. A view of resilience that lays an emphasis on context asserts that, in addition to the particular capabilities and techniques of a person, the situation in which an individual finds themselves is of the highest significance. The final conception takes a systematic approach, viewing resilience as a procedure that includes many dimensions, both internal and external to individuals, that engage in dynamic interaction with one another. This interaction can be seen as both beneficial and detrimental to an individual (Brown et al., 2021).

Resilience in teachers is of the highest importance in all academic settings (Karabiyik, 2020). To provide even more specifics, the traits that are developed as a consequence of resiliency are job satisfaction, responsiveness, effectiveness, consciousness, a source of satisfaction, the ability to initiate, interpersonal relations, proficiency, independence, confidence, effective interpersonal attitudes, sensitivity, and emotionally intelligent teachers (Mullen et al., 2021). Current research has

been conducted to investigate the effect that educator training programs, such as training in insight meditation, have on the resiliency of teachers (Karabiyik, 2020; Polat & Iskender, 2018). An insight meditation program was employed in a practical randomized controlled experiment that was conducted by Galante et al. (2018) to boost the resilient behavior of university students. This study looked at the educational features of the insight meditation program as well as the program's influence to the teachers' anxiety and stress management. Polat and Iskender (2018) conducted a study that was descriptive in nature and found that TR, work satisfaction, fatigue, business commitment, and an evaluation of the organizational environment are closely linked. The research carried out by Lacaba et al. (2020) proved the implications that teachers' levels of resilience have on their levels of devotion and effectiveness. The teachers were aware of the present issues in their teaching practice; yet, they needed to develop their resilience in order to boost their effective teaching and demonstrate their work participation, as demonstrated by the results (Fig. 1).

The concept of autonomy is a perplexed, difficult, and contradicting notion in nature. This is because autonomy may mean different things to different people (Pitt, 2010). It is largely acknowledged upon that this trait is not one that people are endowed with naturally; instead, it is a characteristic that can be instructed and does rely heavily on people's instinctive functionality (Bradshaw et al., 1996). Among the first studies on the concept of autonomy, researchers examined the potential implications of teachers' changing responsibilities in new modes of practice, such as identity (Little, 1995). According to Piaget, autonomy is personality conduct that is free of arbitrary exterior demands and unreasonable inside pressures (Manzano Vázquez, 2018). The great majority of the research literature linked with the subject of language teaching identifies teacher autonomy as a component of an individual's ability to monitor his or her own professional development (Skaalvik et al., 2014). Language TA is encompassed and practiced in their adaptability to figure out how to deal with internal and external restrictions for the advantages of language learning (Han, 2021).

Given the important role of the aforementioned structures in strengthening language instruction and the dearth of research in this field, the purpose of this investigation was to investigate the contributions of TI and TER to TR and TA in higher education. A model was developed to depict the interaction between TI and TER to TR and TA. This model was based on the most recent research in the relevant field as well as relevant theories. After that, a CFA and SEM analysis was performed on this

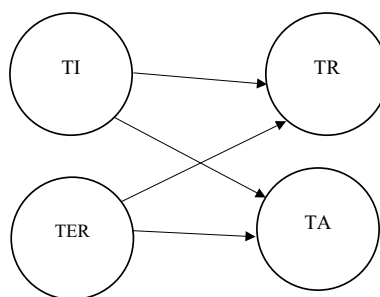


Fig. 1 The proposed model

model, and the findings were discussed. To accomplish the goals of this study, the following research questions were formulated:

1. Is it possible for EFL university professors' TI to provide insight into their resilience?
2. Is it possible for EFL university professors' TER to provide insight into their autonomy?
3. Is it possible for EFL university professors' TI to provide insight into their resilience?
4. Is it possible for EFL university professors' TER to provide insight into their autonomy?

Methodology

The participants in this study totaled 492; there were 185 males and 307 females among the language professors that participated in this study. They were teaching at state-run universities in Khorasan Razavi, Iran. Their ages span anywhere from 31 to 54 years old, and they have from 1 year up to 25 years of teaching experience. English Literature ($n = 114$), English Translation ($n = 146$), Linguistics ($n = 65$), and English Teaching ($n = 167$). There was a total of 401 of whom had a doctoral degree, with the other participants holding a master's degree.

For the purpose of assisting the researchers of this study in collecting data over the course of a period of 3 months in the year 2022, a web-based platform, in this case Google Forms, was developed. This survey has four components, and its goals are to assess TI, TER, TR, and TA. A total of 492 out of all the forms that were given have been returned for a return rate of 87.4%. The use of online surveys improves the capacity to collect data from a diverse range of age groups, geographical locations, and cultural origins. The Kolmogorov–Smirnov test was used first to verify that the data followed a normal distribution. To do an analysis on the data, it was recommended to use parametric techniques once it was discovered that the data followed a normal distribution. CFA and SEM with Linear Structural Relations (LISREL) 8.80 were used to complete the analysis. The instruments that were employed in this research were as following:

The language teacher immunity instrument (LTII), which was developed and validated by Hiver (2017), was used to conduct the assessment of the participants' immunity. This questionnaire consisted of 39 questions with a response scale ranging from 1 to 6 points, with 1 representing severe disagreement and 6 representing strong agreement. The subscales are: Self-efficacy (seven items), burnout (five items), resilience (five items), attitudes toward teaching (five items), openness to change (six items), classroom affectivity (six items), and coping (six items). The total Cronbach alpha for this scale was 0.889, which is an acceptable reliability value.

The language teacher emotion regulation inventory (LTERI) was used to evaluate the TER strategies shown by the participants. This scale was devised by Heydarnejad et al. (2021), and it consists of 27 items and six sub-factors: situation selection, situation modification, attention deployment, reappraisal, suppression, and seeking social support. In the LTERI, the questions were meant to be responded using a five-point

Likert scale, with 1 representing “never” and 5 representing “always”. In the present analysis, the reliability of the LTERI, as measured by Cronbach’s alpha, was found to be satisfactory (with values ranging from 0.826 to 0.892).

The teacher resilience scale (TRS) developed by Daniilidou and Platsidou (2018) is comprised of 26 questions and evaluates four aspects of TR. These aspects are as follows: (a) Personal Competencies and Persistence (9 items), (b) Spiritual Influences (3 items), (c) Family Cohesion (7 items), and (d) Social Skills and Peer Support (7 items). For the first subdimension, answers were given using a Likert scale with five points, ranging from 0 (not at all true) to 4 (nearly usually true). On the second and third subscales, however, responses varied from 1 to 5. Moreover, the internal reliability of the scale was acceptable.

The teacher autonomy questionnaire (TAQ) was designed by Pearson and Hall (1993) to evaluate the level of autonomy possessed by teachers. The degree to which instructors believe they have control over their classrooms is evaluated using this 18-item scale. The TAQ uses a 5-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The survey is broken up into two different scales: general autonomy (consisting of 12 questions), and curriculum autonomy (11 items). The reliability of TAQ was determined to be 0.831.

Findings

In the following, you will find a report on Table 1 that contains the descriptive statistics of the TI, TER, TR, and TA of the participants.

The sub-component of the LTII that obtained the highest mean score overall was the Teaching self-efficacy ($M=23.667$, $SD=8.741$). For the second instrument, the LTERI, the mean score for Situation Modification was 16.481, with a standard deviation of 4.967. The average number of endorsements for Personal Competencies and Persistence among EFL instructors in TRS was 29.197, with a standard deviation of 9.234. In addition, among the subcomponent of TAQ, the dominant approach was Curriculum Autonomy ($M=44.195$, $SD=9.098$).

The Kolmogorov–Smirnov test was carried out so that a determination could be made on the most appropriate statistical analysis.

Table 2 outlines the significance levels that are higher than 0.05 and revealed that the data followed an assumption of normality, suggesting that it is appropriate to make use of parametric statistical approaches.

Thereafter, a Pearson product-moment correlation was performed so as to gain insight into the extent to which a link existed between TI, TER, TR, and TA subcomponents.

As can be seen in Table 3, the connection between TI and TR sub-components was highly significant and favorable. This was the case for the following sub-components: Personal Competencies and Persistence ($r=0.932$), Spiritual Influences ($r=0.882$), Family Cohesion ($r=0.904$), and Social Skills and Peer Support ($r=0.847$). Moreover, the following correlations between TI and TA subfactors were determined to be statistically significant and positive: Curriculum Autonomy ($r=0.821$) and General Autonomy ($r=0.795$). The correlation between TER, TR and TS sub-components were significant and in positive direction: Personal Competencies and Persistence ($r=0.767$),

Table 1 Descriptive statistics

	N	Minimum	Maximum	Mean	Std. deviation
Teaching self-efficacy	472	7	41	23.667	8.741
Burnout	472	5	29	18.180	5.633
Resilience	472	5	30	17.977	5.542
Attitudes toward teaching	472	5	30	17.951	5.301
Openness to change	472	10	35	23.331	4.289
Classroom affectivity	472	11	34	23.400	5.384
Coping	472	9	26	19.269	4.265
Language teacher immunity instrument (LTII)	472	78	199	143.775	24.845
Situation selection	472	5	25	16.693	4.582
Situation modification	472	5	25	16.481	4.967
Attention deployment	472	6	20	13.837	3.566
Reappraisal	472	5	25	17.432	4.736
Suppression	472	4	20	13.657	3.808
Seeking social support	472	4	20	13.371	3.615
The language teacher emotion regulation inventory (LTERI)	472	34	135	91.470	19.957
Personal competencies and persistence	472	9	45	29.197	9.234
Spiritual influences	472	3	15	10.053	3.000
Family cohesion	472	7	35	23.345	6.349
Social skills and peer support	472	7	35	23.655	6.067
Teachers' resilience scale (TRS)	472	30	130	86.250	22.109
Curriculum autonomy	472	21	60	44.195	9.098
General autonomy	472	7	30	19.515	5.069
Teacher autonomy questionnaire (TAQ)	472	33	90	63.710	12.962

Table 2 Results of the Kolmogorov–Smirnov test

Instruments	Subcomponents	Kolmogorov–Smirnov Z	Asymp. Sig. (2-tailed)
Language teacher immunity instrument (LTII)	Teaching self-efficacy	0.841	0.479
	Burnout	0.628	0.825
	Resilience	0.698	0.715
	Attitudes toward teaching	0.970	0.304
	Openness to change	0.833	0.491
	Classroom affectivity	1.085	0.102
	Coping	1.085	0.102
The language teacher emotion regulation inventory (LTERI)	Situation selection	0.566	0.906
	Situation modification	0.843	0.475
	Attention deployment	0.777	0.581
	Reappraisal	0.829	0.497
	Suppression	0.718	0.681
	Seeking social support	0.932	0.350
	Personal competencies and persistence	0.626	0.828
Teachers' resilience scale (TRS)	Spiritual influences	0.908	0.381
	Family cohesion	0.665	0.769
	Social skills and peer support	0.360	0.999
	Curriculum autonomy	1.005	0.124
Teacher autonomy questionnaire (TAQ)	General autonomy	0.846	0.122

Table 3 Measures of agreement between the TSE, LTER, ELTR, MT, and TS factors

	LTI	LTER	Personal competencies and persistence	Spiritual influences	Family cohesion	Social skills and peer support	Curriculum autonomy	General autonomy
LTI	1.000							
LTER	0.675**	1.000						
Personal competencies and persistence	0.932**	0.767**	1.000					
Spiritual influences	0.882**	0.682**	0.642**	1.000				
Family cohesion	0.904**	0.735**	0.653**	0.594**	1.000			
Social skills and peer support	0.847**	0.706**	0.587**	0.587**	0.641**	1.000		
Curriculum autonomy	0.821**	0.659**	0.701**	0.723**	0.813**	0.654**	1.000	
General autonomy	0.795**	0.628**	0.689**	0.761**	0.735**	0.844**	0.532**	1.000

**Correlation is significant at the 0.01 level (2 tailed)

Spiritual Influences ($r=0.682$), Family Cohesion ($r=0.735$), Social Skills and Peer Support ($r=0.706$), Curriculum Autonomy ($r=0.659$), as well as General Autonomy ($r=0.628$).

As a consequence of this, CAF and SEM were used with the statistical program LISREL 8.80 to analyze the nature of the structural relationship that exists between TI, TER, TR, and TA. The results of this evaluation can be found in the following: to bring this section to a close, the model's fit was examined by calculating the chi-square magnitude, the Root Mean Squared Error of Approximation (RMSEA), the normed fit index (NFI), the good fit index (GFI), and the comparative fit index. Each of these indices is a measurement that determines how well the model corresponds to the data (Fig. 2).

An overview of the strengths of the causal links that exist among the variables can be seen in Figs. 3 and 4. It was found that TER had a substantial beneficial effect on TR ($\beta=0.71$, $t=19.85$) and TA ($\beta=0.62$, $t=14.10$). Furthermore, TI had a significant beneficial impact on TR ($\beta=0.85$, $t=28.56$) and TA ($\beta=0.78$, $t=23.10$).

The values of the route coefficients for the interaction that takes place between the TI, TER, TR, and TA Subcomponents are shown in a graphical form in Figs. 4 and 5. Accordingly, TI has a significant and advantageous connection with the TR subcomponents: Personal Competencies and Persistence ($\beta=0.86$, $t=26.69$), Spiritual Influences ($\beta=0.94$, $t=36.43$), Family Cohesion ($\beta=0.88$, $t=29.54$), and Social Skills and Peer Support ($\beta=0.91$, $t=31.65$). In addition, there was a substantial and favorable association between TI and TS sub-factors: Curriculum Autonomy ($\beta=0.91$, $t=31.65$) and General Autonomy ($\beta=0.91$, $t=31.65$). Significant and advantageous associations were found to exist between TER and TR subfactors: Personal Competencies and Persistence ($\beta=0.73$, $t=21.60$), Spiritual Influences

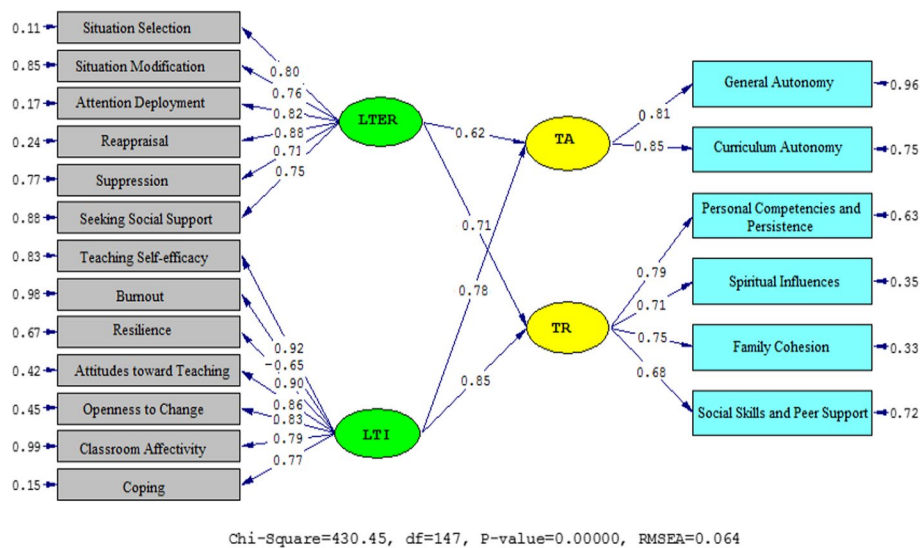


Fig. 2 A symbolic representation of the path coefficients values for the relationship between TI, TER, TR, and TA (model 1)

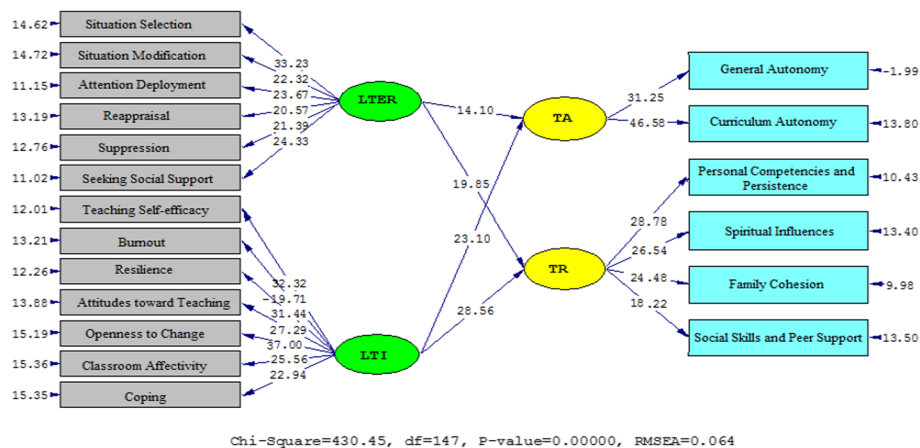


Fig. 3 T significance values for path coefficients (model 1)

($\beta = 0.65$, $t = 17.98$), Family Cohesion ($\beta = 0.70$, $t = 20.38$), and Social Skills and Peer Support ($\beta = 0.68$, $t = 18.17$). Moreover, there was a substantial correlation between TER and the following TA subfactors, and this correlation was positive: Facilitator Curriculum Autonomy ($\beta = 0.63$, $t = 15.75$) and General Autonomy ($\beta = 0.60$, $t = 13.81$).

Indicators of how well the model fits the data are shown in Table 4. The chi-square/df ratio and RMSEA both satisfied the acceptable fit requirements. Moreover, the GFI (0.941), NFI (0.962), and CFI (0.935) were all within acceptable ranges in Model 1. Regarding Model 2, Table 4 displays that GFI (0.932), NFI (0.941), and CFI (0.965) met the acceptable fit standards.

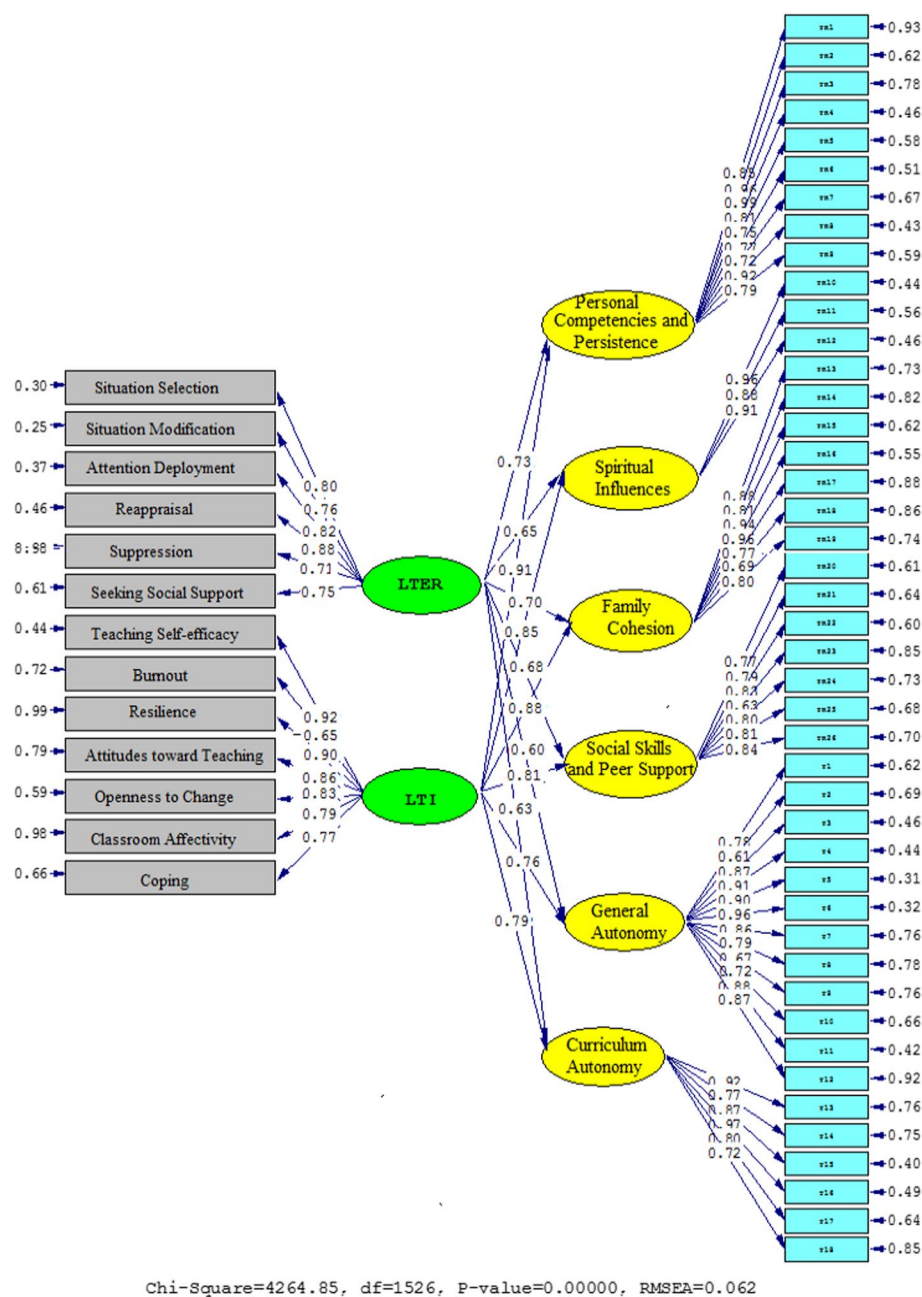


Fig. 4 A symbolic representation of the path coefficients values for the relationship between *TI*, *TER*, *TR*, and *TA* subcomponents (model 2)

Discussion

This research evaluated the likely function of *TI* and *TER* in *TR* and *TA* in higher education. In so doing a model was proposed and tested via SEM and CFA, accordingly. The participants of the current investigation were 492 EFL university professors. It has not been previously researched in the area of English language instruction, especially in higher education, that these notions are associated with one another. Based on the outcomes *TI* and *TER* are significant indicators of the *TR* and *TA* in higher education.

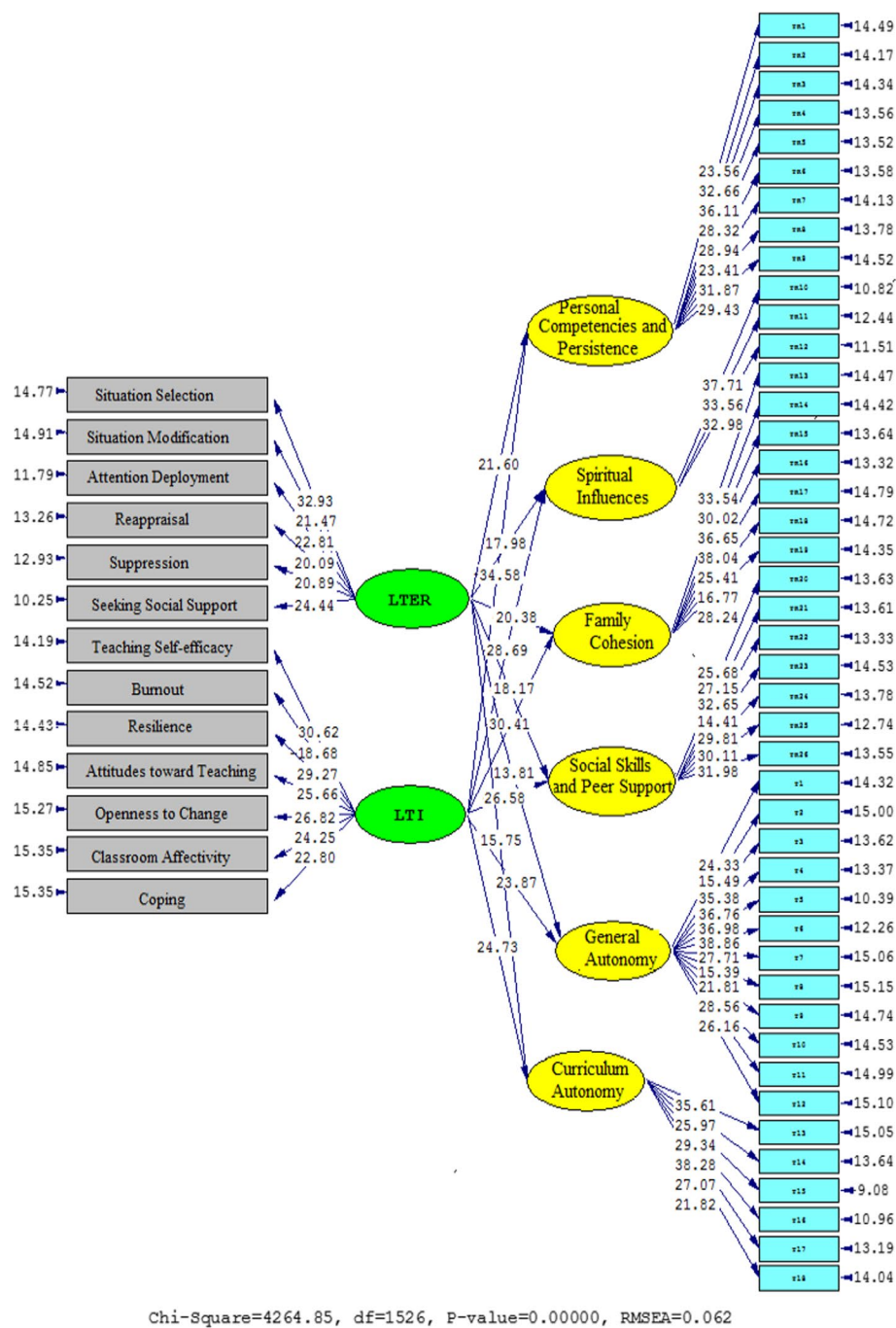


Fig. 5 T significance values for path coefficients (model 2)

Table 4 Model fit indices

Fitting indexes	χ^2	df	χ^2/df	RMSEA	GFI	NFI	CFI
Cut value			<3	<0.1	>0.9	>0.9	>0.9
Model 1	430.45	147	2.928	0.064	0.941	0.962	0.935
Model 2	4264.85	1526	2.795	0.062	0.932	0.941	0.965

Aligned with the results of the research, university professors who have acquired a complete grasp of productive immunity and ER are more resilient and autonomous. TI and TER empower university professors to overcome the tensions and unpleasant situations in their profession.

Firstly, the results indicated that productive immunity was highly correlated with the TR (Model 1). Furthermore, it was concluded that TI significantly influences personal competencies and persistence, spiritual influences, family cohesion, and social skills and peer support (the subfactors of TR). Based on the existing research, teachers with a deep sense of AR may have effective solutions to challenges and can also set positive objectives while seeking to absorb social norms and adjust to personal and social contexts. Overall, it was agreed that reflective thinking and engagement significantly affects the growth of emotion control and productive immunity (Namaziandost et al., 2022). Hence, the capacity to deal with difficulties and recover quickly from setbacks are crucial components of an effective immune system. Moreover, Rahimpour et al. (2020) via path analysis discovered that immunity enhancement immunizes EFL teachers against job instabilities and emotional exhaustion. This finding can be also described based on Hiver & Dörnyei' argument (2017) that TI serves as a shield that guards educators from difficulties including pressure, frustration, and exhaustion that are the perspectives of a reasonable state of resiliency.

An intriguing conclusion related to the second research question proved that the degree of immunity granted to teachers was the factor that best predicted the autonomy of EFL university professors. The fact that EFL teachers' perceived autonomy correlates with their immunity reinforces the notion that autonomous teachers tend to stay in their field, to hold time to think, and to grow professionally (Pearson & Moomaw, 2006). Because the response of language teachers to vulnerabilities is completely reliant on their autonomy in their pedagogies, it is important that language teachers work to develop their immunity so that teacher turnover generated by professional negative issues can be avoided. Provided that the TA is a necessary condition for the growth of autonomous learning (Teng, 2018), one consequence of this outcome is that the advancement of productive immunity may implicitly expedite the advancement of learner autonomy. Furthermore, this discovery has significant repercussions for the improvement of specialized education opportunities for educators. Along this line of inquiry, Manzano Vázquez (2018) emphasized that teacher educators should take on the matter of TA as an appropriate instructional consideration through empowering teachers with opportunities for imposing autonomous responses. Thus, it seems necessary to revise contemporary teacher preparation courses in order to find productive methods for enhancing TI and TA. This lends credence to the argument put out by Azari Noughai et al. (2020), who suggested that TA is a reliable indicator of TI among competent EFL instructors.

In response to the third question posed by the study, the findings indicated that TER has the potential to considerably boost TR. That is, more involvement in ER strategies contributes to a more resilient condition on the part of university teachers. To put it another way, resilient educators are adept at exercising control over the effects of their own emotional experiences. Based on the existing literature, a positive mindset (Stavraki & Karagianni, 2020), positive attitudes and hopefulness (Mercer et al., 2016) can help building TR. It additionally brought out that connection with one's contemporaries and

workplace colleagues constitute one of the most important variables in TR (Karagianni & Papaefthymiou-Lytra, 2018). As a result, the findings of this research may be justified from the point of view of looking for social support, which is one of the components of the LTER model (Heydarnejad et al., 2021). Furthermore, Khanshan and Yousefi (2020) asserted that resilient teachers are hopeful, capable of building intimate ties with everyone, encouraged, skillful in managing their emotions. This output highlights the criticality of TER in boosting and directing TR.

Taking into consideration the last study question, the findings mirrored (Model 1 and Model 2) that TER is strongly influence their autonomy. The strong relationship between the teachers' engagement and their immunity suggests that remain in the profession responsible and in an energetic manner may depends of a healthy state of ER. Consequently, it is possible to understand that several components of a TER might have an effect on EFL teacher's autonomy in higher education (i.e., curriculum autonomy and general autonomy). This correlation existed between TER and TA may even be clarified through the lens of attention deployment and reappraisal as one of the core aspects of TER (Buric' et al., 2017; Frenzel et al., 2021), which is attributed with autonomous behaviors. The findings that confirmed the link between teacher emotion and TA might be understood to suggest that learning how to control one's emotions is an invaluable ability for enhancing the prerequisite of TA. This offers validity to the claims made by Deng et al. (2022), who hypothesized that language instructors who were able to maintain control of their emotions could experience greater work engagement. In addition, this provides support to the hypothesis put out by Chang and Taxer (2020), who said that the management of emotions, especially unpleasant emotions, by educators might provide significant possibilities for educational innovation. This research has significant ramifications for indicating the relevance of controlling one's emotions in assisting language instructors in overcoming obstacles. Furthermore, a perspective that the ER strategies might bestow a harmony in the working practice of the university professors, leading to more optimism and commitment in instructional strategies, is another interpretation that may be attributed to the results.

Conclusion

Although it has been generally accepted that TI, TER, TR, and TA provide various benefits for language teachers, there is little information recognized about how they interact with one another. The results of the present investigation revealed that TI and TER provide a significant contribution to TR, and TA. In addition, it offered substantial empirical evidence for the idea that, by using immunity and ER, instructors may enhance their practice in spite of the turbulence and unpredictability of the classroom environment. Because of this, language teachers' attitudes on the teaching profession become more upbeat, which, in turn, enhances the probability that one will be successful rather than fail.

When taken as a whole, the findings suggest that TI and TER play an important role in the promotion of TR and TA. By incorporating findings such as these into practice, more efficient pre-service and in-service programs are held for teachers. It is essential that educators, teachers, and policymakers become informed with the significant role that TI and TER play in their profession. As a consequence of this, studies such as the

one that is now being conducted provide information that is both enlightening and valuable to anybody working in the area of language training.

The results of the recent study need to be interpreted taking into mind the two limitations that are described further below, and both of these aspects need more research in the future. Firstly, there is not a qualitative or data-driven understanding of the opinions held by teachers and educators as part of this inquiry. As a direct consequence of this, it is possible that future research may use a greater number of mixed-method techniques to study the link that was researched in a way that is more precise. Secondly, the current study did not analyze demographic aspects such as the teachers' cultural and socio-economic backgrounds, the fields of study they specialize in, the amount of experience they have with mastering, or their pedagogical training. In further research, it may be possible to study the demographic aspects that may have a role in determining the TI, TER, TR, and TA of language instructors. In addition, the findings of this investigation, along with the findings of any other academic research, have to be verified in other EFL settings.

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All authors had equal contribution.

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Availability of data and materials

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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