

Global transformational leadership scale: cross-cultural adaptation of Indonesian sports science student context

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ABSTRACT

Transformational leadership has become an essential aspect of life skills integrated into a learning activity. At the same time, the tools for evaluating transformational leadership in the context of sports students in Indonesia still need to be improved. This study aims to adapt the global transformational leadership scale (GTLS) into the Indonesian version constructed from seven potential behaviors (vision, staff development, supportive, empowerment innovative, lead by example and charismatic). Testing content validity uses nine raters from various disciplines. Construct validity uses 297 students and concurrent validity by correlating GTLS scores with the leadership practices inventory (LPI). The data were analyzed using the Aiken formula, factor analysis, Pearson, and Cronbach's alpha with the help of the SPSS-AMOS. The result was that the seven adapted GTLS items met the Aiken validity parameter=0.74-0.96, construct validity (discriminant index=0.59-0.70; factor loading=0.63-0.77; p-value=0.000; RMR=0.013; GFI=0.961; TLI=0.952, CFI=0.968; RMSEA=0.080), concurrent validity ($r=0.467$), and reliability parameters=0.87. Thus, the Indonesian version of GTLS is valid and reliable for measuring transformational leadership in sports student culture. However, GTLS only facilitates members' perceptions of their group leaders, so it is necessary to develop a GTLS scale oriented towards students perceiving their transformational leadership. These two data from different perspectives (peer and self-perception) enlarge the results of lecturers' comprehensive measurement, assessment, evaluation, and improvement of their students' leadership.

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1. INTRODUCTION

Current leadership emphasizes processes, practices, and interactions [1] to produce outputs and outcomes in the form of quality performance [2]. Practical efforts to interact and influence others require a

leadership style that prioritizes empowerment for members' self-development to achieve the vision without excessive punitive treatment. The ideal leadership style offers a productive vision to "hypnotize" members to participate totally (physically and psychologically). Leadership style is very crucial for business and social organizations in the global realm. In particular, leading organizations admire the concepts and practices of transformational leadership because they are visionary, facilitating, and empowering [3], by creating intrinsic motivation to improve their abilities [4] and influence the extent to which followers assess organizational goals as important and consider it achievable, leading to work attitudes and proactive behavior [5]. Transformational leadership is an effective leadership style and is widely practiced in organizations, including schools, because it influences individual behavior in organizations [6] such as increasing the performance and social responsibility of members [7], [8], cultivating behavior innovative work [9], [10], predicts resilience and motivation [11], and creates effective organizations by driving change and individual, team, and organizational success [12], [13].

Observing the current trend of group learning (3-7 students), the design of student learning experiences should no longer be sectoral (for example, only on mastery of thinking skills). Lecturers can optimize group learning trends to develop students' transformational leadership, by developing group learning behavior that is visionary, supportive, empowering, innovative, and exemplary. Readers can track several educational and learning programs that integrate student leadership, including the women's leadership development program [14] and cooperative learning [15]. Students can learn various skills in a learning experience to be competent in specific material (for example, thinking skills) and skill at developing transformational leadership. Therefore, the main task of lecturers is to diagnose and design various opportunities for developing students' transformational leadership using credible evaluation tools so that they can monitor their progress periodically until the end of learning or the end of the semester. To this extent, when they become teachers, they can use their leadership values to transform themselves and their organizations (classes and schools). One example of transformation, when someone becomes a teacher, he can transform his learning class by developing students' potential by understanding cultural differences and learning according to student's needs [16]. Thus, teachers first shift their values and beliefs from traditional to transformational learning to influence them to broaden and improve their goals and give them the confidence to learn beyond their expectations [17].

Scientists have developed instruments to measure leadership, such as the leadership practices inventory (LPI) (challenging the process, inspiring a shared vision, enabling others, modeling the way, and encouraging the heart) [18], [19], and the multifactor leadership questionnaire (individual consideration, charismatic, and intellectual stimulation) [20]. However, these scales were developed not only to accommodate only (more general) transformational leadership indicators. Along with the development of leadership theory, specific scales for transformational leadership have been successfully developed in various parts of the world, such as developing the global transformational leadership scale (GTLS) in Australia [21], developed the new transformational leadership questionnaire (TLQ-LGV) in England [22], developed the TLQ in China [23], developed the transformational leadership survey in the United States [24], developed the German transformational leadership inventory (GTLI) in Germany [25], developed the Czech questionnaire of transformational leadership (CQTL) in Czech [26] developed the transformational leadership scale (TLS) in Turkey [27], developed the GTLS in Portugal [28], and developed the TLQ in Malaysia [29]. These advances conclude that transformational skills are the latest leadership trend [12] in improving the quality and achievement of organizational goals.

We have emphasized that transformational leadership is essential and needs to be deliberately integrated and evaluated in higher education learning activities to prepare prospective teachers who will be transformative in their future work environment. For this reason, a practical, accommodating, and credible evaluation tool is needed to measure student transformational leadership. Referring to the collection of results from the development of the TLS above (see third paragraph), we decided to adapt the GTLS developed by Carless *et al.* [21] to the context of Indonesian sports science teacher candidates (students). The rationalization and the behavioral attributes developed in GTLS are the results of the synthesis of transformational leadership behavior offered by Bass [30] and Podsakoff *et al.* [31], where a transformative leader must have seven central behavioral attributes: i) vision (communicates a clear and positive vision of the future); ii) staff development (treats staff as individuals, supports and encourages their development); iii) supportive leadership (gives encouragement and recognition to staff); iv) empowerment (fosters trust, involvement and cooperation among team members); v) innovative thinking (encourages thinking about problems in new ways and questions assumptions); vi) leads by example (is clear about his/her values and practices which he/she preaches); and vii) charismatic (instills pride and respect in others and inspires me by being highly competent).

The seven behaviors above are vital for teaching faculty students because, as individuals, they are responsible for national education goals. It means that they need to adhere to a futuristic vision to produce competent human resources, they must support and facilitate various supportive learning experiences, foster

trust and collaboration between fellow students through the student centre learning model, and be able to offer various alternative solutions when students experience obstacles during their studies, and they must become role models in promoting various ethical behaviors in order to strengthen their charisma as a leader for their students. Thus, this research question is how to adapt GTLS to be more contextual and operational in measuring and assessing Indonesian sports students' version of transformational leadership using the cross-cultural adaptation method?

2. RESEARCH METHOD

The GTLS adaptation process to the Indonesian version uses the protocol, initial translation, synthesis of the translation, back translation, expert committee, test of the prefinal version, and submission of documentation to the developer or coordinating committee for appraisal of the adaptation process [32]. First, the initial translation. This stage involved three translators, the first and second translators have knowledge and concepts about transformational leadership to provide a more clinical perspective on measurement constraints and good English skills. Meanwhile, the third translator is an English education lecturer, who needs to have the concept of GTLS as a confirmatory to produce translations from different perspectives.

Second, synthesis of the translation. Synthesize the translation results from the first, second, and third translators to formulate editorial formulas that suit the population culture. Apart from being based on the substance of GTLS, the synthesis also highlights the contextual problem of using GTLS in group learning-based learning/lectures for sports science students so that solutions are sought for several problems to produce a shared consensus on the results of the GTLS translation.

Third, back translation. Some of the original version translators may need to be updated or satisfactory due to differences in content and technicalities. Consistency cannot be guaranteed; therefore, a back-translation is needed. Back translation is included in the validity check to confirm that the translated version of the GTLS (synthesis result) represents the exact item content as the original version of the GTLS. During back translation, the translator has no interest in avoiding information bias while minimizing imperfections or conceptual inconsistencies in the translation questionnaire.

Fourth, the expert committee. According to Beaton *et al.* [32], this committee's composition is crucial for achieving cross-cultural equality. The composition of the expert committee consists of lecturers and researchers on sports, lecturers, and researchers in human resources management and leadership, sports leadership and policy, sports psychology, and psychology, as well as educational research and evaluation whose task is to assess the synthetic version of the GTLS ($M \pm SD$ age= 41 ± 10.4 ; $M \pm SD$ work experience= 14.2 ± 11.1), see Table 1. The results of the expert committee review were analyzed descriptively using the help of Microsoft Excel and AMOS version 24 to determine the mean and standard deviation and adopted the Aiken formula [33] to test the validity of the content. This study used nine expert committees with four rating categories ($p < 0.05$), so the Aiken coefficient used ≥ 0.74 . In addition, to test the inter-rater reliability from Pearson's intraclass correlation coefficients with a 95% confidence interval, namely: i) < 0.50 (poor), ii) $0.50-0.75$ (moderate), iii) $0.75-0.90$ (good), and iv) > 0.90 (excellent) [34].

Table 1. Expert committee

No	Education	Gender	Age	Work experience	Affiliation
1	Prof., Dr., M.Pd.	Male	62	36	Universitas Pendidikan Indonesia
2	Dr., M.Pd.	Male	46	21	Universitas Tribuana
3	S.E., M.M.	Female	38	5	Universitas Pelita Harapan
4	S.Psi., M.A.	Female	33	5	Universitas Muhammadiyah Kalimantan Timur
5	Dr., M.Pd.	Male	34	4	Universitas Sriwijaya
6	Dr., M.Pd.	Female	33	9	Universitas PGRI Jombang
7	Dr., M.Pd.	Male	53	26	Universitas Kristen Artha Wacana
8	S.Pd., M.Pd.	Female	34	10	STKIP Pasundan
9	S.Pd., M.Pd.	Male	36	12	Universitas Siliwangi

Fifth, the prefinal version test. This stage is a field trial of the GTLS that has been synthesized and validated by a committee of experts. The trials were carried out on 297 students (male=211, female=86; $M \pm SD=21.5 \pm 4.19$) from the first semester (16.2%), third semester (29.6%), fifth semester (38.4%), seventh semester (13.5%), and ninth semester (2.4%). Participants come from various universities in Indonesia, which are not limited to Universitas Kristen Artha Wacana (East Nusa Tenggara Province), Universitas Negeri Surabaya (East Java Province), Universitas Sebelas Maret (Central Java Province), Universitas Negeri Jakarta (Jakarta Special Capital Region Province), Universitas Siliwangi (West Java Province), Universitas Negeri Medan (North Sumatra Province), Universitas Negeri Padang (West Sumatra Province), Universitas

Abulyatama (Aceh Province), Universitas Pattimura (Maluku Province), Universitas Palangka Raya (Central Kalimantan Province). They were determined using convenience sampling techniques; they were a group of individuals who (conveniently) participated in the research, who were most approachable, or, in another way, easily accessible to the researcher using a Google Form [35]. They are including physical education, health, and recreation study program, physical education study program, sport education study program, sport coaching education study program, and sport science study program. Each test subject completed filling out the questionnaire using a 5 Likert scale (strongly agree-disagree) version of the Google Form, circulated via WhatsApp group or e-Mail.

Test the construct validity of GTLS items using the item discrimination index (DI) with norms: i) $DI \geq 0.40$ (then the item is functioning satisfactorily), ii) $0.30 \leq DI < 0.39$ (then little or no revision is required), iii) $0.20 \leq DI < 0.29$ (then the item is marginal and needs revision), and iv) $DI \leq 0.19$ (then the item should be eliminated or wholly revised). Thus, the accepted DI parameter is > 0.30 [36]–[38]. In addition, it used exploratory and confirmatory factor analysis (CFA) with the SPSS-AMOS application version 24. Data analysis using CFA is seen from loading factor criteria > 0.30 [39], [40] and the model fit or goodness of fit based on chi-square (χ^2), p-value, root mean squared residual (RMR), goodness of fit index (GFI), Tucker Lewis index (TLI), comparative fit index (CFI), and root mean square error of approximation (RMSEA) [41].

Concurrent validity testing uses Pearson analysis to correlate the GTLS value with the LPI value by [18]. LPI consists of 30 Likert scale items (always-never), which are constructed from five main indicators, respectively: the way model (items 1, 6, 11, 16, 21, 26; $\alpha=0.86$), inspire a shared vision (items 2, 7, 12, 17, 22, 27; $\alpha=0.90$), challenge the process (items 3, 8, 13, 18, 23, 28; $\alpha=0.81$), enable others to act (items 4, 9, 14, 19, 24, 29; $\alpha=0.89$), and encourages the heart (items 5, 10, 15, 10, 25, 30; $\alpha=0.94$). LPI has also been re-tested in a broader population, involving 2.8 million respondents from various demographic backgrounds [19]. The correlation coefficient uses the norms: i) 0.00-0.10 (negligible), ii) 0.10-0.39 (weak), iii) 0.40-0.69 (moderate), iv) 0.70-0.89 (strong), and v) 0.90-1.00 (very strong) [42], [43]. Whereas the GTLS reliability test uses the Cronbach alpha formula and the norms: i) < 0.60 (poor), ii) 0.60 to < 0.70 (acceptable for exploratory research), iii) 0.70 to < 0.80 (good), iv) 0.80 to < 0.90 (excellent), v) 0.90 to 0.95 (somewhat high), and vi) ≥ 0.95 (too high; indicators are redundant) [41].

Lastly is the submission of documentation to the developer or coordinating committee for appraisal of the adaptation process. It is the final stage of the GTLS adaptation process by conducting an audit or verification process. According to Beaton *et al.* [32], the translation results are acceptable as long as the researcher has followed the protocol correctly. Nevertheless, as a form of accountability, GTLS adaptations are published online in scientific periodicals so that various interested parties can access them.

3. RESULTS AND DISCUSSION

3.1. Results

3.1.1. Initial translation

The first step in cross-cultural adaptation is to do an initial translation. Beaton *et al.* [32] recommend that a minimum of two translators be involved, one with a background similar to the GTLS concept and another translator otherwise, to naturally produce a translation that fits the population. The original concept of translation refers to the process of re-contextualization between languages [44] so that a translator knows the ideas he wants to measure in a questionnaire to provide a more similar translation to the original instrument [45]. The success of a translation depends on achieving equivalence. However, such equivalence requires a difficult task since no two languages are identical, either in the meaning given to corresponding symbols or in how these symbols are arranged in phrases and sentences [46]. For this reason, when developing a transcript, the translator must translate the words directly and reduce the meaning of the original version of the transcript.

The first and second translators have expertise with educational partners and international publications in human resources management, leadership, and organizational behavior. It is to produce a more clinical perspective of transformational leadership in the Indonesian version (adaptation). Meanwhile, the third translator is an English education lecturer with no background, experience, or concepts about transformational leadership to produce natural translation results per the original GTLS version. These three translated transcripts will be an interesting data collection because they will produce different translation works, where the first and second works translate items "directly" but remain clinically appropriate to the context of transformational leadership and translation works that are "directly" textually appropriate with the statement items (without context due to not having clinical experience in transformational leadership). All translators were tracked through the Google Scholar platform and confirmed their willingness to participate via email.

The initial translation results from the three translators produced three different transcriptions (redactions), as seen in Table 2. For example, translation 1 (T1) translates "Communicates a clear and positive vision of the future" as "*Berkomunikasi secara jelas dan berpandangan positif jauh ke depan*". It differs from

the other two translators, T2-T3, which both translate "Communicating a clear and positive vision of the future" as "*Mengomunikasikan visi masa depan yang jelas dan positif*". These differences are collected as data that will be synthesized in the second stage (see synthesis of the translation). Thus, the main task in this phase (initial translation) is to ensure that each translator produces a translation transcript appropriate to their experience or clinical meaning of the GTLS items. It will be the basis for the researcher to determine the item adaptation.

Table 2. Initial translation

No	Original version	Translation 1	Translation 2	Translation 3
1	Communicates a clear and positive vision of the future.	<i>Berkomunikasi secara jelas dan berpandangan positif jauh ke depan.</i>	<i>Mengomunikasikan visi masa depan yang jelas dan positif.</i>	<i>Mengkomunikasikan visi masa depan yang jelas dan positif.</i>
2	Treats staff as individuals, supports and encourages their development.	<i>Memperlakukan bawahan secara personal, mendukungnya, dan memberikan dorongan untuk berkembang.</i>	<i>Memperlakukan staf dengan baik, mendukung dan mendorong pengembangan staf.</i>	<i>Memperlakukan staf sebagai individu, mendukung dan mendorong perkembangan mereka.</i>
3	Gives encouragement and recognition to staff.	<i>Memberikan dorongan dan pengakuan terhadap prestasi bawahan.</i>	<i>Memberikan dorongan dan pengakuan terhadap staf.</i>	<i>Memberikan dorongan dan pengakuan kepada staf.</i>
4	Fosters trust, involvement and cooperation among team members.	<i>Memupuk rasa percaya, keterlibatan, dan kerjasama antar anggota tim.</i>	<i>Menumbuhkan rasa kepercayaan, keterlibatan, dan kerjasama di antara anggota tim.</i>	<i>Menumbuhkan kepercayaan, keterlibatan, dan kerjasama di antara anggota tim.</i>
5	Encourages thinking about problems in new ways and questions assumptions.	<i>Mendorong berpikir kreatif ketika menghadapi permasalahan dan menjelaskan asumsi-asumsi.</i>	<i>Mendorong pemikiran masalah dengan cara yang baru dan asumsi pertanyaan yang baru.</i>	<i>Mendorong pemikiran tentang masalah-masalah dalam cara-cara baru dan pertanyaan-pertanyaan yang bersifat asumsi.</i>
6	Is clear about his/her values and practices which he/she preaches.	<i>Memiliki nilai-nilai yang kokoh dan konsisten dalam perkataan.</i>	<i>Penjelasan mengenai nilai dan praktik yang dilaksanakan.</i>	<i>Jelas tentang nilai-nilai dan praktik yang diutarakan.</i>
7	Instills pride and respect in others and inspires me by being highly competent.	<i>Menanamkan kebanggaan dan rasa hormat pada orang lain serta menginspirasi saya untuk memiliki kompetensi yang baik.</i>	<i>Menanamkan kebanggaan dan rasa hormat pada orang lain dan menginspirasi sehingga menjadi seorang yang kompeten.</i>	<i>Menanamkan kebanggaan dan rasa hormat pada orang lain dan menginspirasi diri sendiri dengan cara menjadi sangat kompeten.</i>

3.1.2. Synthesis of the translation

The development of the original version of GTLS uses a banking population, while the adapted version wants to be applied in a group learning culture. According to Sterie and Bernard [47], during the synthesis session, the expert review team was allowed to make changes adapted to the language of the population. Therefore, the synthesis stage pays attention to editorials that refer to the culture of group learning so that editorials are paraphrased but do not eliminate the meaning of the substance. For example, items 2 and 3 change the word "staff" to "team member". The word "team member" has appeared in the original GTLS scale in item 4. Item 3 is also equipped with the word achievement to clarify the meaning of recognition in learning activities (e.g., giving recognition to team members whose performance has increased). Item 5 also uses the word "creative" to make it more operational in explaining the word "new ways" from the original version, such as how the role of the leader uses creative thinking (new ways) in solving problems.

Item 6 is a concern in the synthesis process because this item explains the attributes of exemplary leadership behavior. For this reason, based on the translation results (T1-T3), the editorial reduction that facilitates the meaning of item 6 is "Have strong values and consistently practice what is said". The meaning is that a leader has strong values or character for organizational progress (we can simplify it into study groups) and can show consistency in practice or daily application. For example, a leader calls for discipline in team members. At the same time, he is always disciplined in various ways. Similar terms are adapted in other contexts (including fairness, and more). While items 1 and 7 did not experience significant changes according to the translation results, as seen in Table 3.

3.1.3. Back translation

The back translation aims to diagnose the differences between the two versions of the translation (the original version and the back translation version [46], [48] to maintain the psychometric properties of the established scale in the translated version [49] and simultaneously identify differences between these two versions are probably caused by actual translation errors, namely translation from source to target language [48]. Researchers used bilingual translators from English education lecturers to translate concepts and categories from

the synthetic version (Indonesian). Editorially, not all item's translations are similar to the original version. However, the results of back translation still guarantee that the translated version retains the meaning of the original version. For example, in item 1, the results of the back translation found that the translator produced the same transcript as the original version, namely "Communicates a clear and positive vision of the future", as well as item 3, namely "Fosters trust, involvement and cooperation among team members", and item 7, namely "Instills pride and respect in others and inspires me by being highly competent".

The other four items had different editorials during the back translation. However, the items still maintain the meaning and purpose of the original item formulation in measuring student transformational leadership. For example, item 2 of the original version reads, "Treats staff as individuals, supports and encourages their development". In contrast, the back translation reads, "Well-treat the team members, support and encourage them to develop". The original version of item 3 reads, "Gives encouragement and recognition to staff". In contrast, the back translation version reads, "Give encouragement and recognition of the achievements of team members", as well as in item 5, changes have been made to the synthesis results to make it more clear and operational by changing the word "new ways" to "creative", see Table 4. This difference is motivated by cultural differences. The original version is based on the fundamental organizational culture, while the translated version is adapted to sports science students' learning culture (pseudo organizations). Related to these differences, Tyupa [50] stated that language is about communication, so the essential thing in the success of back translation is that participants and reviewers can understand linguistic meanings and share their understanding of certain expressions.

Table 3. Synthesis of the translation

No	Original version	Translation synthesis version
1	Communicates a clear and positive vision of the future.	<i>Mengomunikasikan visi masa depan yang jelas dan positif.</i>
2	Treats staff as individuals, supports and encourages their development.	<i>Memperlakukan anggota tim dengan baik, mendukung dan memberikan dorongan kepada mereka untuk berkembang.</i>
3	Gives encouragement and recognition to staff.	<i>Memberikan dorongan dan pengakuan terhadap prestasi anggota tim.</i>
4	Fosters trust, involvement and cooperation among team members.	<i>Menumbuhkan rasa kepercayaan, keterlibatan, dan kerjasama di antara anggota tim.</i>
5	Encourages thinking about problems in new ways and questions assumptions.	<i>Mendorong pemikiran kreatif ketika menghadapi permasalahan dengan pertanyaan-pertanyaan yang bersifat asumsi.</i>
6	Is clear about his/her values and practices which he/she preaches.	<i>Memiliki nilai-nilai yang kokoh dan konsisten mempraktikkan apa yang diucapkan.</i>
7	Instills pride and respect in others and inspires me by being highly competent.	<i>Menanamkan kebanggaan dan rasa hormat pada orang lain serta menginspirasi saya untuk menjadi orang yang kompeten.</i>

Table 4. Back translation

No	Translation synthesis version	Back translation
1	<i>Mengomunikasikan visi masa depan yang jelas dan positif.</i>	Communicate a clear and positive vision of the future.
2	<i>Memperlakukan anggota tim dengan baik, mendukung dan memberikan dorongan kepada mereka untuk berkembang.</i>	Well-treat the team members, support and encourage them to develop.
3	<i>Memberikan dorongan dan pengakuan terhadap prestasi anggota tim.</i>	Give encouragement and recognition of the achievements of team members.
4	<i>Menumbuhkan rasa kepercayaan, keterlibatan, dan kerjasama di antara anggota tim.</i>	Foster trust, involvement, and cooperation among team members.
5	<i>Mendorong pemikiran kreatif ketika menghadapi permasalahan dengan pertanyaan-pertanyaan yang bersifat asumsi.</i>	Encourage creative thinking when dealing with problems using questions assumptions.
6	<i>Memiliki nilai-nilai yang kokoh dan konsisten mempraktikkan apa yang diucapkan.</i>	Have solid values and consistently practice what is preaches.
7	<i>Menanamkan kebanggaan dan rasa hormat pada orang lain serta menginspirasi saya untuk menjadi orang yang kompeten.</i>	Instill pride and respect in others and inspires me being highly competent.

3.1.4. Expert committee

The committee of experts involved in content validation is those with experience in education and teaching, research, and publications relevant to the GLTS assessment. At least the involvement of an expert committee has considered recommendations [32]; the composition of this expert committee is very important to achieve cross-cultural equality so that the composition consists of human resources experts, leadership experts, physical education and sports experts, methodologists, linguists, translator experts involved in the research process. They were given the original version of the GTLS format and the translated version (initial translation, synthesis translation, and back translation) via Google Forms, and they responded to the results of their work using 4 rating categories on a Likert scale. Aiken analysis explains that all GTLS items are valid because ≥ 0.74 (0.74-0.96), see Table 5. The results of the inter-rater reliability test from Pearson's intraclass correlation coefficients prove that the agreement value between ratters is moderate (0.59). Meanwhile, the results of the reliability test showing that the item has an excellent degree of reliability (0.83) with a range of 0.78-0.84.

Table 5. Expert committee validation

Item	Expert committee									M+SD	Aiken-V	Decision
	1	2	3	4	5	6	7	8	9			
1	4	3	4	4	4	4	3	4	4	3.78+0.44	0.93	Valid
2	4	4	4	4	4	4	3	4	4	3.89+0.33	0.96	Valid
3	4	4	4	3	4	4	3	4	4	4.78+0.44	0.93	Valid
4	4	3	4	4	4	4	3	4	4	3.78+0.44	0.93	Valid
5	4	3	4	4	3	3	3	4	4	3.56+0.53	0.85	Valid
6	4	4	4	2	2	3	2	4	4	3.22+0.97	0.74	Valid
7	4	4	4	3	3	4	3	4	4	3.67+0.50	0.89	Valid

3.1.5. Test of the prefinal version

At this stage, the new instrument must maintain reliability, construct validity, and concurrent validity [32]. This stage conducted GTLS field trials on 297 students to test construct validity. The first is to look for an item DI to measure the validity of the quality of the item by explaining how well an item can distinguish between knowledgeable participants and those who are not knowledgeable or between participants who have high abilities and those who have low abilities [38], [51]. The results of the DI analysis of the 7 GTLS items using Pearson's correlation (corrected item-total correlation) prove that all items function satisfactorily because $DI > 0.30$ (0.59-0.70), see Table 6.

Then do a factor analysis (exploratory and CFA). The test results found a Kaiser-Meyer-Olkin measure of sampling adequacy value of 0.896 with a Bartlett's test of sphericity value of 853.517 (df=21, sig=0.000). In addition, the anti-image value correlation GTLS ranges from 0.867 to 0.932, so the item load value highly contributes to the structure of the GTLS factor. The seven items passed the extraction method: principal component analysis and formed one factor with a total eigenvalue of 3.980 (% of variance=56.853). While the component matrix values range from 0.69-0.80, as seen in Table 6, meaning that GTLS has met the factor loading parameters from Tabachnick and Fidell [39] and Hair *et al.* [40].

Table 6. Test of the prefinal version (descriptive analysis, DI, and factor loadings)

No	My team leader	M+SD	CrIT	λ (EFA)	λ (CFA)
1	Communicate a clear and positive vision of the future.	4.56±0.54	0.61	0.72	0.65
2	Well-treat the team members, support and encourage them to develop.	4.66±0.50	0.66	0.77	0.73
3	Give encouragement and recognition of the achievements of team members.	4.48±0.55	0.68	0.78	0.75
4	Foster trust, involvement, and cooperation among team members.	4.60±0.54	0.70	0.80	0.77
5	Encourage creative thinking when dealing with problems using questions assumptions.	4.33±0.67	0.59	0.69	0.63
6	Have solid values and consistently practice what is preaches.	4.40±0.65	0.68	0.77	0.72
7	Instill pride and respect in others and inspires me being highly competent.	4.51±0.59	0.64	0.74	0.69

The one factor structure of EFA was then tested with CFA. CFA is a powerful statistic for examining properties and relationships between latent constructs (e.g., attitudes, traits, intelligence, and clinical disorders). CFA allows researchers to test specific hypotheses about the factor structure of a data set and offers a measure of model fit that can be used to make model change decisions by providing evidence of structural validity, which can be used to improve the validity of a test or questionnaire by detecting relevant and irrelevant items while extracting valuable factors from a data set [52]–[54]. The CFA results also confirm that each GTLS item meets the validity parameter because the factor loading (λ) values range from 0.63 to 0.77, see Table 6. Testing the fit model with CFA using the SPSS-AMOS program shows that the value of $\chi^2=40.824$, df=14, p-value=0.000 (<0.05), RMR=0.013 (<0.08), GFI=0.961 (>0.90), TLI=0.952 (>0.90), CFI=0.968 (>0.90), and root mean square error of approximation (RMSEA)=0.080 (≤ 0.08) so it can be concluded that the adapted version of GTLS satisfies the fit model parameters.

Concurrent validity is needed to carry out criterion validity that predicts individual performance on different tests almost simultaneously [55]. More specifically, concurrent validity denotes the amount of agreement between two different judgments in which one judgment is newly developed. While the other is well-established and valid. In other words, the authors of the new assessment want their assessment to have high validity with an established and respected assessment [56]. Before testing the concurrent validity, a normality test was performed using the Kolmogorov-Smirnov (unstandardized residual). The results were normally distributed data, with a sig.>0.05 (0.453) so that it is continued with testing using parametric statistics (Pearson correlation).

In the original version, Carless *et al.* [21] tested the validity of the concurrent GTLS with LPI and multifactor leadership questionnaire (MLQ). However, in this study, only testing GLTS and LPI, the rationalization of LPI accommodates concepts equivalent to the development of GTLS. For example, vision

(GTLS) by inspiring shared a vision (LPI), supportive leadership (GTLS) by encouraging the heart (LPI), empowerment (GTLS) by enabling others (LPI), innovative thinking (GTLS) by challenging the process (LPI), lead by example (GTLS) with modeling the way (LPI). The Pearson output explains a total correlation of 0.467 (sig.=0.000). Therefore, based on the norms of Schober *et al.* [42] and Dancey and Reidy [43], the GTLS concurrent validity is confirmed to be moderate (0.40-0.69).

Correlation results based on GTLS indicators, detailing the highest correlation of vision is with the indicator encouraging the heart (0.382), the highest correlation of staff development is with the indicator enabling others to act (0.316), the highest correlation of supportive leadership is with the indicator encouraging the heart (0.356), correlation the highest correlation of empowerment is with the indicator encouraging the heart (0.309), the highest correlation of innovative thinking is with the indicator encouraging the heart (0.373), the highest correlation of lead by example is with the indicator encouraging the heart (0.391), and the highest correlation charismatic is with the indicator encouraging the hearts (0.384). Meanwhile, the correlation based on the LPI indicator shows that all LPI indicators have the highest correlation with GTLS 6 (lead by example; 0.380-0.416), as seen in Table 7.

Table 7. Concurrent validity (intercorrelation GTLS with LPI)

LPI	GTLS						
	1	2	3	4	5	6	7
Model the way	0.363**	0.277**	0.310**	0.245**	0.372**	0.400**	0.317**
Inspire a shared vision	0.361**	0.214**	0.266**	0.213**	0.355**	0.387**	0.320**
Challenge the process	0.374**	0.218**	0.263**	0.219**	0.369**	0.380**	0.284**
Enable others to act	0.367**	0.316**	0.315**	0.307**	0.370**	0.391**	0.357**
Encourage the heart	0.382**	0.302**	0.356**	0.309**	0.373**	0.416**	0.384**

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

In addition to testing the construct validity and concurrent validity, reliability tests were done to answer the credibility of the GTLS adaptation. The total internal reliability coefficient of Cronbach's alpha from the results of the GTLS trial obtained a value of 0.87 (details per item, 0.85=71.43%, and 0.86=28.57%) so it is interpreted that there is a certainty of 87% of the consistency of GTLS items in displaying the same results repeatedly, see Table 8. The reliability coefficient is classified as excellent (0.80 to <0.90) according to the norms of Hair *et al.* [41]. Thus, adapting the GTLS to the sports student version in Indonesia proved reliable as a measurement tool.

Table 8. Adapted version reliability (content and construct)

Reliability test	GTLS						
	1	2	3	4	5	6	7
Content	0.81	0.80	0.80	0.81	0.81	0.84	0.78
Construct	0.86	0.85	0.85	0.85	0.86	0.85	0.85

3.1.6. Submission of documentation to the developer or coordinating committee for appraisal of the adaptation process

The final result of adaptation is marked by submitting reports to various interested parties to carry out external verification of the adaptation version [32]. Considering that this adaptation is helpful for broader interests, the results of the adaptation are published in online scientific periodicals. The goal is, firstly, to simplify the verification process from other experts to ensure that the adaptation process that has been carried out has passed a strict protocol while at the same time guaranteeing the results of testing the content validity, construct validity, concurrent validity, and GTLS reliability. Second, provide technical guidance for teachers and lecturers in sports science and others who wish to pay special attention to transformational leadership development for university students during the learning process. Finally, it provides an opportunity for other researchers to place the adaptation results as a reference for further research development or as a comparison in conducting similar studies if there are deficiencies both conceptually and in the testing methodology.

The final version of the GTLS adaptation still maintains the structure of seven potential indicators of transformational leadership behavior (vision, staff development, supportive, empowerment innovative, lead by example and charismatic) using the 5-point Likert scale (always-never), see Table 9. Meanwhile, to determine the categorization, we use the four-interval distance with the details: i) 7-14 (poor), ii) 15-21 (fair), iii) 22-28 (good), and iv) 29-35 (very good).

Table 9. The final GTLS Indonesian adaptation version

No	Ketua tim saya	Tanggapan				
		Sl	Sr	Kd	Jr	Tp
1	Mengomunikasikan visi masa depan yang jelas dan positif.					
2	Memperlakukan anggota tim dengan baik, mendukung dan memberikan dorongan kepada mereka untuk berkembang.					
3	Memberikan dorongan dan pengakuan terhadap prestasi anggota tim.					
4	Menumbuhkan rasa kepercayaan, keterlibatan, dan kerjasama di antara anggota tim.					
5	Mendorong pemikiran kreatif ketika menghadapi permasalahan dengan pertanyaan-pertanyaan yang bersifat asumsi.					
6	Memiliki nilai-nilai yang kokoh dan konsisten mempraktikkan apa yang diucapkan.					
7	Menanamkan kebanggaan dan rasa hormat pada orang lain serta menginspirasi saya untuk menjadi orang yang kompeten.					

Note: Always=Sl (selalu), Often=Sr (sering), Sometimes=Kd (kadang-kadang), Seldom=Jr (jarang), Never=Tp (tidak pernah)

3.2. Discussion

This study aims to adapt GTLS using the cross-cultural adaptation of self-report measures to the culture of Indonesian sports science students. It is proven that the seven potential transformational leadership behaviors meet the content validity parameters of Aiken-V (0.74-0.96), have high DI values (0.59-0.70), meet the factor loading parameters (0.63-0.77), GFI (0.961), TLI (0.952), CFI (0.968); RMSEA (0.080), concurrent validity ($r=0.467$), and reliability (0.86-0.87). According to Morgado *et al.* [57], sample size can show differences in results in psychometric analysis. Nevertheless, this research can maintain its reliability and validity by taking a relatively small sample from other similar studies and after going through cross-cultural methods. Thus, this adaptation's results can measure transformational leadership in the culture of sports students in Indonesia.

Based on a review of many publications regarding the development of TLS, researchers still rely on factor analysis to prove the scale's validity, model fit, and reliability. For example, Carless *et al.* [21] succeeded in developing GTLS with a range factor loading of 0.72-0.88, RMSEA=0.11, RMSR=0.03, and RNI=0.97. Hence, the model indicated fit with an average variance extracted (AVE) value of 0.93. Meanwhile, convergent validity found that the correlation between GTLS, LPI, and MLQ ranged from 0.71-0.87. Another study from Li and Shi [23] also found that the factor loading values for each item on the TLQ ranged from 0.62-0.81. Testing the fit model proved the value of GFI=0.86, NFI=0.88, TLI=0.91, CFI=0.92, and RMSEA=0.06. While Cronbach's alpha values range from 0.84-0.92. GTLI development from Krüger *et al.* [25] also found that the model fit index was very good, namely GFI=0.99, AGFI=0.98, and SRMR=0.05. The internal consistency of Cronbach's alpha from the TLI scale supports the idea that transformational and transactional leadership can be assessed with an acceptable level of reliability (0.68-0.90 for follower ratings and 0.62-0.83 for self-ratings).

The study of Prochazka *et al.* [26] also confirmed positive results in the development of CQTL with a value of CFI=0.96 and RMSEA=0.05 so that CQTL was confirmed as a fit model. The internal consistency of all scales is high ($\alpha>0.70$). The last study by Beveren *et al.* [28] is more "appropriate" in discussing the results with this research because they both adapted GTLS from the work of Carless *et al.* [21]. The results show that CFI presents a very good value (0.98) and RMSEA with a value of 0.097. Regarding internal consistency, Cronbach's alpha obtained is 0.96. In addition, the nomological validity test showed a high positive correlation between GLTS and group autonomy ($r=0.55$, $p<0.001$) and quality of group experience ($r=0.53$, $p<0.001$). It means that, methodologically, the results of this study can still be confirmed with other studies that have been conducted before. Several methodological supplements were added in this study that are different from or not carried out in the Beveren *et al.* [28]. In addition, in testing nomological/concurrent validity, Beveren *et al.* [28] uses group autonomy and quality group experience. Meanwhile, this study uses LPI because it is more representative and correlates with the concept of transformational leadership, as was done in the development of the original version of Carless *et al.* [21].

This research is the only one that contributes to adapting transformational leadership instruments that are more contextual, practical, valid, and reliable for the learning culture of sports science students at universities. At the same time, the results of this research can be adopted as a research instrument, bearing in mind that there has never been a transformational leadership instrument successfully developed by scientists for sports science students in the near future. Not only that, but the results of the review also revealed that there needed to be more research reports on transformational leadership in the field of learning for sports science students. It indicates that lecturers still need to pay more attention to student leadership development while organizing their learning. So that one day, students become teachers, visionaries, and facilitators, empowering and focusing on the needs of their students [3]. In addition, the formation of transformational leadership helps them create innovative work behavior [9], [10], as well as create intrinsic motivation to increase their ability to act to advance organizational goals [4] and encourage them to work on attitudes and proactive behavior [5].

Let us read Karakose *et al.* [58] bibliometric study report. They discuss that transformational leadership is widely adopted and tested as a model to strengthen school improvement through teacher leadership and teaching effectiveness. It means that transformational leadership is vital in building school culture through how teachers develop their teaching quality. In various developments over time, transformative teachers play a strategic role because they are not only able to adapt to rapid changes, but they are the ones who will create the changes themselves. Teacher leadership is increasingly emphasized in innovative educational practices [59], so it is not an exaggeration that prospective teachers must be prepared to become teachers who have transformative solid power using credible instruments so that they can drive change, especially in teaching and educational practices. Innovative thinking is one of the behaviors in GTLS, so this is one of the strong reasons why researchers need to adapt GTLS in the student context (apart from its practicality). Even though it was developed 24 years ago, the behaviors assessed (such as innovative thinking) are still very relevant to students' current and future learning needs.

The practical contribution of this research is that it has provided a measuring tool for seven potential models of transformational leadership behavior for students (potential teachers) represented in the adapted GTLS. The adapted GTLS helps lecturers prepare profiles of prospective teachers with transformative leader characteristics by measuring, assessing, and evaluating students' transformative learning experiences in higher education. Apart from the practical number of items, this adapted version has been proven valid and reliable for use in the context of sports science students (including physical education) in Indonesia. Finally, the findings of this research provide practical implications for educational practice and policy in Indonesia because lecturers no longer have the hassle of finding and using practical and credible measuring tools to measure the transformational leadership of their students because the Indonesian adapted version of GTLS is available. Leadership has become an important focus in the direction of Indonesian education policy through the implementation of the independent curriculum (especially in the teacher mobilization program), where teachers must become leaders who can mobilize learning in the learning classroom and their professional community (for example in teacher working groups or deliberations subject teachers).

4. CONCLUSION

Transformational leadership is one of the behavioral attributes of life skills, so it must be one of the goals when organizing group learning. The adapted version is proven to be able to maintain its validity and reliability after passing Aiken validity test=0.74-0.96, construct validity (DI=0.59-0.70; factor loading=0.63-0.77; p-value=0.000; RMR=0.013; GFI=0.961; TLI=0.952; CFI=0.968; RMSEA=0.080), concurrent validity ($r=0.467$), and Cronbach alpha=0.87. The results of this research have provided progress that helps lecturers by providing and promoting contextual, practical, and credible measuring tools in maximizing the practice of integrating transformational leadership in learning. With a transformation orientation, the seven behaviors measured are attributed to the vision, staff development, supportive leadership, empowerment, innovative thinking, leading by example, and charisma. The seven experiences or learning behaviors above must be realized by students through specific learning models so that students' transformative concepts and actions can be assessed and evaluated continuously using GTLS.

Of the seven GTLS behavioral attributes, "Foster trust, involvement, and cooperation among team members" received the most significant approval/attention ($\lambda=0.77$). Therefore, in carrying out organizational activities in class, learning lecturers must encourage leadership that allows colleagues to actively participate in various study groups, such as listening to opinions, completing assignments together, or forming a consensus. In contrast, the behavior "Encourage creative thinking when dealing with problems using questions assumptions" has the lowest approval/concern ($\lambda=0.63$). This phenomenon is motivated by Indonesian sports students' various learning experiences based on motor behavior. Therefore, their perspective on transformational leadership has not optimized critical and creative reasoning when making decisions. Finally, GTLS only facilitates members' perceptions of their group leaders, so it is necessary to develop a scale oriented towards students perceiving their transformational leadership. These two data from different perspectives (peer and self-perception) increase the results of comprehensive student leadership measurement, assessment, evaluation, and improvement.

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