Table of Contents:

S 1) Proposed shortened WIA-Scale ("WIA-Scale-Short"; 7/8 items; English)
S 2) WIA-Scale (German)
S 3) Extended descriptive statistics
   a. Sub-groups (e.g., federal states, types of educational institutions) and differences between learners and educators
   b. Distributions (histograms for learners and educators)
S 4) Explorative correlation analyses
   a. Table with all calculated correlations
   b. Regression model on sustainable behavior (incl. analysis with sub-set of items which are primarily outside of educational institutions)

S 1) Proposed shortened WIA-Scale ("WIA-Scale-Short"; 7/8 items; English)

In the following Table 1, we propose a shortened variant of the WIA-Scale, including one item per area of action (5 for learners, 6 for educators) as well as one item on organizational culture and participation respectively. The two meta-items (coherence, motivation) can be added if needed. For the presented data from Germany, the shortened variant correlates very highly with the overall WIA-Scale ($r_{learners}$ = .962***; $r_{educators}$ = .977***). This suggests that the shortened variant may be used if a longer version of the scale cannot be used due to constraints to the number of items.

Table 1: Proposition for a shortened variant of the WIA-Scale (WIA-Scale-Short) with 7 items for learners and 8 items for educators (one for each area of action as well as one for organizational culture and participation respectively).

Constructs and Sub-Constructs	**Learners**	**Educators**
	At my educational institution…	
Learning: Action-Orientation / Link to practical activities	... learning about sustainability involves practical activities *(e.g. in our building, on the grounds, …).*	... I link teaching about sustainability with practical activities *(e.g. in our building, on the grounds, ...).*
Community: Service to the Community	... direct contributions are made to making the surrounding region more sustainable *(e.g. through voluntary work, projects, ...).*	... direct contributions are made to making the surrounding region more sustainable *(e.g. through voluntary work, projects, ...).*
Management: Sustainable Purchasing	... the sustainability of materials, food and other products is really important *(e.g. organic, regional, fair trade, recycling, ...).*	... the sustainability of materials, food and other products is really important *(e.g. organic, regional, fair trade, recycling, ...).*
Governance: Coordination & Leadership (top-down)	... sustainability is actively strengthened and promoted by the people in charge *(e.g. by the management / principal / president).*	... sustainability is actively strengthened and promoted by the people in charge *(e.g. by the management / principal / president).*

Capacity Building: Staff Development on (E)SD	- *(only educators)*	... I am given support in gaining the skills and knowledge I need to teach sustainability.
Communication: Expression of SD through the Design of Buildings / Campus	... the way buildings and the grounds are designed gives me the impression that sustainability is being put into practice.	... the way buildings and the grounds are designed gives me the impression that sustainability is being put into practice.
Culture: Topic for Conversations outside of Class	... sustainability is an important issue in conversations outside the classroom/courses.	... sustainability is an important issue in conversations outside the classroom/courses.
Participation	... I am encouraged and supported to take part in important decisions *(e.g. what and how we learn, how we design the grounds, ...).*	... I am encouraged and supported to take part in important decisions.
Optional: Use of meta-items in addition to the scale:		
Pars-pro-toto (WIA-Coherence)	... sustainability is put into practice across the different areas of the school / higher education institution.	... sustainability is put into practice across the different areas of the school / higher education institution.
Outcome-Indicator (WIA-Sust-Motivation)	... day to day life motivates me to do more for sustainability.	... day to day life motivates me to do more for sustainability.

S 2) WIA-Scale (German)

Table 2: Overview of the WIA-Scale in German for learners and educators sorted by constructs and sub-constructs.

Constructs and Sub-Constructs	**Learners**	**Educators**
	An meiner Bildungseinrichtung …	
Learning 1: Action-Orientation / Link to practical activities	… ist Lernen über Nachhaltigkeit mit praktischen Aktivitäten verbunden *(z.B. Gestalten unseres Gebäudes, Aktionen auf dem Gelände, …).*	1. … verbinde ich das Lehren über Nachhaltigkeit mit praktischen Aktivitäten *(z.B. Gestalten unseres Gebäudes, Aktionen auf dem Gelände, …).*
Learning 2: Educators as facilitators	... vermitteln mir die Lehrenden nicht nur Wissen, sondern sie begleiten und unterstützen mich auf meinem eigenen Lernweg.	... vermittle ich nicht nur Wissen an die Lernenden, sondern begleite und unterstütze sie auf ihrem eigenen Lernweg.
Community 1: Involvement of Community Members	… lernen wir zu Nachhaltigkeit auch durch den Austausch mit Personen außerhalb der Bildungseinrichtung *(z.B. Einladung von Referent*innen, Ausflüge in die Region, …).*	… lernen wir zu Nachhaltigkeit auch durch den Austausch mit Personen außerhalb der Bildungseinrichtung *(z.B. Einladung von Referent*innen, Ausflüge in die Region, …).*
Community 2: Service to the Community	… wird ein direkter Beitrag dazu geleistet, die umliegende Region nachhaltiger zu gestalten *(z.B. durch ehrenamtlichen Einsatz, Projekte, ...).*	… wird ein direkter Beitrag dazu geleistet, die umliegende Region nachhaltiger zu gestalten *(z.B. durch ehrenamtlichen Einsatz, Projekte, ...).*

Management 1: Reduction of Resource Use	… wird darauf geachtet, dass sparsam mit Ressourcen umgegangen wird *(z.B. geringer Energieverbrauch, Vermeidung von Lebensmittelverschwendung, ...).*	… wird darauf geachtet, dass sparsam mit Ressourcen umgegangen wird *(z.B. geringer Energieverbrauch, Vermeidung von Lebensmittelverschwendung, ...).*
Management 2: Sustainable Purchasing	... wird großer Wert darauf gelegt, dass Materialien, Lebensmittel und andere Produkte nachhaltig sind *(z.B. Bio, Regional, Fair-Trade, Recycling, ...).*	6... wird großer Wert darauf gelegt, dass Materialien, Lebensmittel und andere Produkte nachhaltig sind *(z.B. Bio, Regional, Fair-Trade, Recycling, ...).*
Governance 1: Coordination & Leadership (top-down)	… wird Nachhaltigkeit aktiv von der Leitung gestärkt und gefördert *(z.B. durch die Schulleitung / Rektor*in / Präsident*in).*	… wird Nachhaltigkeit aktiv von der Leitung gestärkt und gefördert *(z.B. durch die Schulleitung / Rektor*in / Präsident*in).*
Governance 2: Critical (self-)evaluation	… wird kritisch überprüft, was in unserer Einrichtung zu Nachhaltigkeit getan wird.	… wird kritisch überprüft, was in unserer Einrichtung zu Nachhaltigkeit getan wird.
Capacity Building 1: Recognition for (E)SD engagement from Leadership	- (nur Lehrende)	… werden Mitarbeitende in ihrem Engagement für Nachhaltigkeit durch die Leitung wertgeschätzt.
Capacity Building 2: Staff Development on (E)SD	- (nur Lehrende)	… werde ich darin unterstützt, Kompetenzen und Wissen zu erlangen, die ich benötige, um Nachhaltigkeit zu lehren.
Communication 1: Expression of SD through the Design of Buildings / Campus	… vermittelt mir die Gestaltung der Gebäude und des Geländes den Eindruck, dass Nachhaltigkeit praktisch gelebt wird.	… vermittelt mir die Gestaltung der Gebäude und des Geländes den Eindruck, dass Nachhaltigkeit praktisch gelebt wird.
Communication 2: Internal and External Visibility	...wird großer Wert darauf gelegt, dass Nachhaltigkeit ein sichtbares Thema ist *(z.B. auf der Webseite, auf Plakaten, …).*	...wird großer Wert darauf gelegt, dass Nachhaltigkeit ein sichtbares Thema ist *(z.B. auf der Webseite, auf Plakaten, …).*
Culture 1: Role-Model for Sustainability	… erlebe ich die Lehrenden als Vorbilder für Nachhaltigkeit.	… erlebe ich die Kolleg*innen als Vorbilder für Nachhaltigkeit.
Culture 2: Topic for Conversations outside of Class	… ist Nachhaltigkeit ein wichtiges Thema in Gesprächen außerhalb des Unterrichts / der Lehrveranstaltungen.	… ist Nachhaltigkeit ein wichtiges Thema in Gesprächen außerhalb des Unterrichts / der Lehrveranstaltungen.
Participation	… werde ich darin ermutigt und unterstützt, an wichtigen Entscheidungen mitzuwirken *(z.B. was und wie gelernt wird, wie wir das Gelände gestalten, …).*	… werde ich darin ermutigt und unterstützt, an wichtigen Entscheidungen mitzuwirken.
Pars-pro-toto (WIA-Coherence)	… wird Nachhaltigkeit in den verschiedensten Bereichen der Schule / Hochschule gelebt.	… wird Nachhaltigkeit in den verschiedensten Bereichen der Bildungseinrichtung gelebt.
Outcome-Indicator (WIA-Sust-Motivation)	… motiviert mich der Alltag, zu mehr Nachhaltigkeit beizutragen.	… motiviert mich der Alltag, zu mehr Nachhaltigkeit beizutragen.

S 3) Descriptive statistics

a. Sub-groups (e.g., federal states, types of educational institutions) and differences between learners and educators

The descriptive statistics (federal state, type of school, etc.) are given below according to various characteristics. The differences shown are generally small, if they exist at all. Since the underlying survey was not conducted with institutions but with individuals from various institutions, these results are to be regarded as preliminary and therefore do not serve as a standardization sample.

Table 3: Descriptive overview of means (M) and standard deviations (SD) for federal states, areas of education as well as different types of schools and higher education institutions

	Learners	*Educators*
Federal states (with n > 100)		*(with n > 50)*
Baden-Württemberg	*M = 2,7461 (SD = 0,74)*	*M = 2,9911 (SD = 0,70)*
Bavaria	*M = 2,7091 (SD = 0,78)*	*M = 3,0744 (SD = 0,69)*
Berlin	*M = 2,6669 (SD = 0,71)*	
Hesse	*M = 2,6412 (SD = 0,78)*	
Lower Saxony	*M = 2,7210 (SD = 0,71)*	
North Rhine-Westphalia	*M = 2,7352 (SD = 0,75)*	*M = 3,0336 (SD = 0,73)*
Rhineland Palatinate	*M = 2,6917 (SD = 0,76)*	
Saxony	*M = 2,6663 (SD = 0,74)*	
Area of education		
School	*M = 2,6801 (SD = 0,72)*	*M = 3,0087 (SD = 0,72)*
Vocational training	*M = 2,5477 (SD = 0,82)*	*M = 2,9461 (SD = 0,82)*
Higher education	*M = 2,8081 (SD = 0,74)*	
Full-day school	*M = 2,7529 (SD = 0,70)*	
Non-full-day	*M = 2,6575 (SD = 0,73)*	
Private	*M = 2,7499 (SD = 0,69)*	
Public	*M = 2,6701 (SD = 0,73)*	
Types of school (with n > 90)		*(with n > 50)*
Selective secondary schools (not for HE)	*M = 2,7710 (SD = 0,69)*	*M = 2,9476 (SD = 0,70)*
Comprehensive secondary schools	*M = 2,6824 (SD = 0,70)*	*M = 3,1469 (SD = 0,78)*
Selective secondary schools (for HE)	*M = 2,6669 (SD = 0,72)*	*M = 3,0320 (SD = 0,75)*
Primary schools		*M = 2,9699 (SD = 0,68)*
University	*M = 2,8131 (SD = 0,73)*	
University of Applied Sciences	*M = 2,8220 (SD = 0,77)*	

There is a statistically significant difference in the overall mean of learners and educators with small to medium effect size (d = 0.39***).

b. Distributions (histograms for learners and educators)

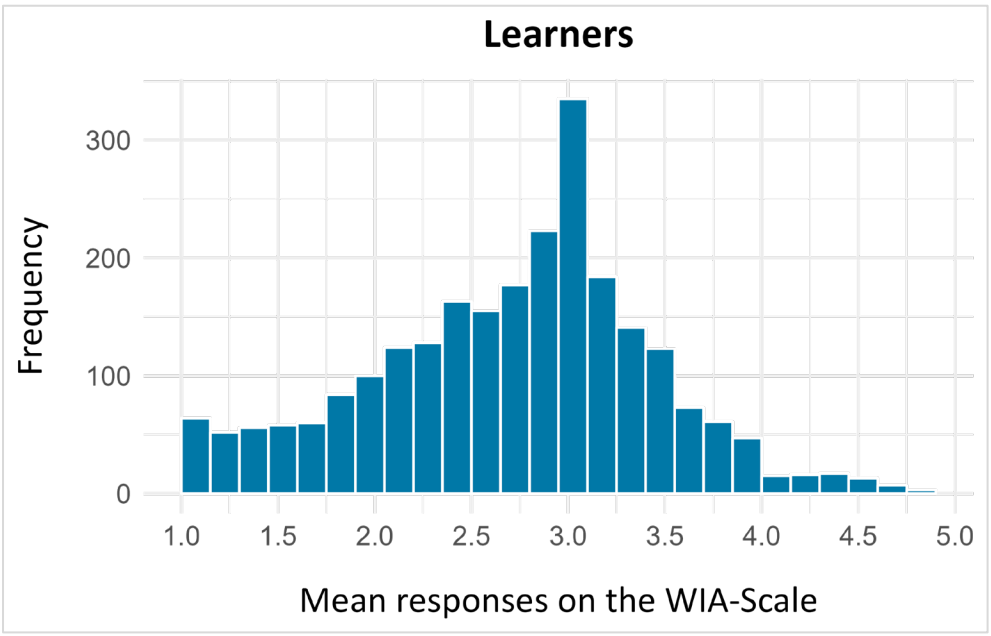

Figure 1: Distribution of the mean responses (histogram for learners; n = 2,481).

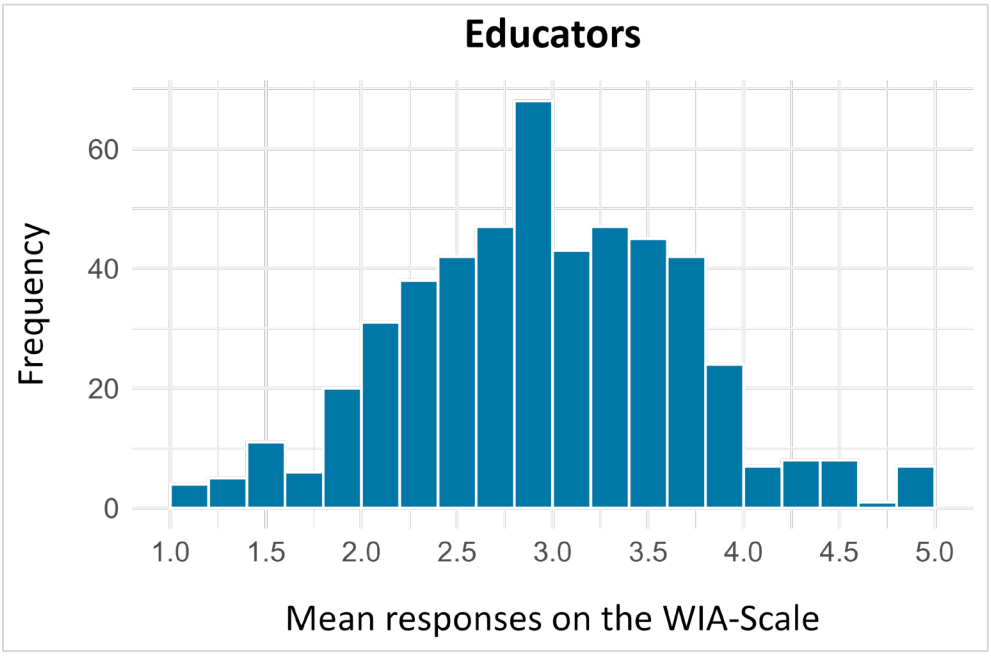

Figure 2: Distribution of the mean responses (histogram for educators; n = 504)

As discussed in the main article, the skewness of the distribution (more individuals at the low end of the scale than at the high end) can be seen as a strength, as it allows for high selectivity without ceiling effects, even if real WIA implementation is increased in the future.

S 4) Explorative correlation analyses

a. Table with all calculated correlations

In the following, Table 4 provides an overview of all Spearman correlations calculated in the exploratory analysis, including those not reported in the main text. The negative correlations with knowledge (lower scores correspond to better self-reported knowledge) and barriers (fewer barriers) were recoded in the main text and reported as positive correlations to avoid confusion.

Table 4: Overview of all Spearman correlations calculated in the exploratory analysis, including those not reported in the main text.

Subjective knowledge on sustainable development (answers in grades (1-6), lower answers correspond with better grades)	Learners: *r* = -.166 *** Educators: *r* = -.240*** (knowledge on ESD: r = -.353***)
Self-reported sustainable behavior	Learners: *r* = .295*** Educators: *r* = .401***
Attitudes towards sustainability / sustainable development	Learners: *r* = -.072*** Educators: *r* = .130**
Emotions regarding sustainability / sustainable development	Learners: *r* = -.012 (p = .542) Educators: *r* = .099 *
Well-being	Learners: *r* = .149*** Educators: *r* = .187***
Frequency of contacts with sustainability in formal education *(measure for convergent validity)*	Learners: *r* = .493*** Educators: *r* = .473***
Perceived empowerment by one´s educational institution to make important contributions to the solving of sustainability issues (e.g., climate change, biodiversity loss).	Learners: *r* = .554***
Relevance of ESD for one´s teaching	Educators: *r* = .342***
Perceived barriers for ESD implementation	Educators: *r* = -.244***
Participation in ESD-trainings (number)	Educators: *r* = .258***

b. Regression model on sustainable behavior (incl. analysis with sub-set of items which are primarily outside of educational institutions)

Table 5: Coefficients of the multiple regression analysis predicting sustainable behavior in young people (*n* = 2385).

Variable	ß	SE	b	p
Whole Institution Approach	0.196	0.013	0.272	< .001
Emotions regarding sustainability	0.188	0.020	0.218	< .001
Connectedness with nature	0.069	0.007	0.174	< .001
Ecological Problem awareness	0.041	0.007	0.110	< .001
Attitudes regarding sustainability	0.074	0.017	0.097	< .001
Age	0.010	0.004	0.048	.006
Connectedness with humanity	0.012	0.006	0.034	.055
Money at disposal	< 0.001	0.000	0.012	.487
Gender	-0.001	0.023	0.000	.982

Adjusted $R2 = 0.287$ ($p < .001$)

Table 6: Test of the statistical requirements of the multiple linear regression model (for details on the procedure, see Grund & Brock, 2020). Heteroscedasticity is not a statistical problem in this case because the regression model is robust to a violation of precisely this precondition.

Statistical Requirement	
Linearity (theoretically assumed)	Yes
Normal distribution of the residues (integrative analysis of histograms and Shapiro-Wilk Test)	Rather yes (histogram looks OK even though Shapiro Wilk test is significant due to big n)
Independence of residues (when Durbin Watson score is between 1.5 and 2.5)	Yes (1.956)
Homoscedasticity (diagram with ZRESID in Y und ZPRED in X)	No
No multicollinearity (when tolerance is > 0.10)	Yes (lowest tolerance is 0.541)
No zero variance of the predictors and independent measurements	Yes

Alternative calculation with the behavior scale consisting of only items that specifically address behavior outside the educational institution

Items used as part of the shortened behavior scale:

1. *In den letzten vier Monaten habe ich andere über soziale Medien für das Thema Nachhaltigkeit sensibilisiert.*
2. *In den letzten vier Monaten habe ich mich in einer Gruppe / Organisation engagiert, die sich für nachhaltige Entwicklung einsetzt.*
3. *Im letzten Jahr habe ich Geld zur Unterstützung von nachhaltigkeitsbezogenen Projekten gespendet.*

Table 7: Coefficients of the multiple regression analysis predicting sustainable behavior (using a shortened 3-item version of the scale which very strictly targets behaviors that occur outside of the educational institution) in young people (*n* = 2385).

Variable	ß	SE	b	p
Whole Institution Approach	0.350	0.022	0.312	< .001
Attitudes regarding sustainability	- 0.138	0.029	- 0.116	< .001
Connectedness with nature	0.069	0.013	0.111	< .001
Emotions regarding sustainability	0.092	0.035	0.068	.008
Connectedness with humanity	0.028	0.011	0.050	.010
Ecological Problem awareness	0.016	0.013	0.027	.216
Age	0.008	0.006	0.024	.215
Money at disposal	< 0.001	0.000	0.018	.337
Gender	- 0.11	0.039	- 0.006	.771

Adjusted $R2 = 0.135$ ($p < .001$)

References

Grund, J., & Brock, A. (2020). Education for Sustainable Development in Germany: Not Just Desired but Also Effective for Transformative Action. *Sustainability*, *12*(2838), 1–20. https://doi.org/10.3390/su12072838