

Appendix A: Supplementary Tables

Table A.1

Means, standard deviations, difference scores, mean differences, and correlation coefficients for corrected and uncorrected text contributions of students (N = 69)

	Corrected text contributions		Uncorrected text contributions		Diff ^a	Z ^b	r ^c	ICC
	<i>M</i>	(<i>SD</i>)	<i>M</i>	(<i>SD</i>)				
Forum								
Proportion of STEM words ^d	0.86	(0.97)	0.76	(0.74)	0.10	−0.98	.98**	.92
Number of STEM words ^e	10.83	(15.71)	10.01	(14.59)	0.81	−3.58**	.99**	1.00
Chat								
Proportion of STEM words ^d	0.70	(0.97)	0.63	(0.86)	0.06	−3.04**	.99**	.99
Number of STEM words ^e	5.26	(7.43)	4.81	(6.91)	0.45	−3.03**	.99**	.99

Note. ^a Difference of mean values between corrected and uncorrected text contributions (text contributions_{corrected} − text contributions_{uncorrected}). ^b Z-value for Wilcoxon test; * $p < .05$, ** $p < .01$. ^c r = Spearman rank correlation coefficient (two-sided); * $p < .05$, ** $p < .01$. ^d Proportion of STEM words as a percentage of total words written by a female student. ^e Average number of STEM words written per female student.

Table A.2

Norming of the proportional STEM communication of the students in forum, chat, and email in percentile ranks and stanine values

Percentile ranks	Stanine	Proportion of STEM words (forum, $N = 533$)	Proportion of STEM words (chat, $N = 613$)	Proportion of STEM words (email, $N = 1,531$)
0 – 4	1	0.00	0.00	0.00
> 4 – 11	2	0.00	0.00	0.00 – 0.17
> 11 – 23	3	0.00	0.00 – 0.07	0.18 – 0.45
> 23 – 40	4	0.00 – 0.37	0.08 – 0.27	0.46 – 0.77
> 40 – 60	5	0.38 – 0.83	0.28 – 0.58	0.78 – 1.23
> 60 – 77	6	0.84 – 1.48	0.59 – 0.95	1.24 – 1.75
> 77 – 89	7	1.49 – 2.44	0.96 – 1.55	1.76 – 2.42
> 89 – 96	8	2.45 – 3.53	1.56 – 2.42	2.43 – 3.59
> 96 – 100	9	3.54 – 10.53	2.43 – 6.15	3.60 – 7.81

Note. Proportion of STEM words = Percentage of STEM words of a female student's total words written in a mentoring year.

Table A.3

Parallel-test reliability coefficients for students' STEM communication in forum, chat, and email

Forum, chat, & email ($N = 665$)	Dictionary component				
	1	2	1 & 2	3	1, 2 & 3
Proportion of STEM words (DC 1)	-	.95**	.99**	.97**	.97**
Proportion of STEM words (DC 2)		-	.97**	.95**	.95**
Proportion of STEM words (DC 1 & 2)			-	.98**	.98**
Proportion of STEM words (DC 3)				-	1.00**
Proportion of STEM words (DC 1, 2 & 3)					-
Forum ($N = 295$)	Dictionary component				
	1	2	1 & 2	3	1, 2 & 3
Proportion of STEM words (DC 1)	-	.94**	.97**	.94**	.93**
Proportion of STEM words (DC 2)		-	.97**	.94**	.95**
Proportion of STEM words (DC 1 & 2)			-	.97**	.97**
Proportion of STEM words (DC 3)				-	1.00**
Proportion of STEM words (DC 1, 2 & 3)					-
Chat ($N = 231$)	Dictionary component				
	1	2	1 & 2	3	1, 2 & 3
Proportion of STEM words (DC 1)	-	.97**	.99**	.98**	.98**
Proportion of STEM words (DC 2)		-	.99**	.97**	.97**
Proportion of STEM words (DC 1 & 2)			-	.99**	.99**
Proportion of STEM words (DC 3)				-	1.00**
Proportion of STEM words (DC 1, 2 & 3)					-
Email ($N = 641$)	Wörterbuch-Komponente				
	1	2	1 & 2	3	1, 2 & 3
Proportion of STEM words (DC 1)	-	.95**	.99**	.98**	.97**
Proportion of STEM words (DC 2)		-	.96**	.94**	.95**
Proportion of STEM words (DC 1 & 2)			-	.98**	.98**
Proportion of STEM words (DC 3)				-	.99**
Proportion of STEM words (DC 1, 2 & 3)					-

Note. Spearman rank correlation coefficients (two-sided) are reported as parallel-test reliability coefficients; * $p < .05$; ** $p < .01$. Proportion of STEM words (DC) = percentage of STEM words of a female student's total words written in a mentoring year, measured with the indicated component of the STEM dictionary.

Table A.4

Split-half reliability coefficients and Cronbach's alphas for students' STEM communication in forum, chat, and email

Forum, chat, & email ($N = 816$)	
Proportion of STEM words ^a	.51 (.55)
Number of STEM words ^b	.82 (.83)
STEM word (yes/no) ^c	.94 (.93)
Forum ($N = 390$)	
Proportion of STEM words ^a	.43 (.50)
Number of STEM words ^b	.93 (.89)
STEM word (yes/no) ^c	.92 (.93)
Chat ($N = 491$)	
Proportion of STEM words ^a	.65 (.56)
Number of STEM words ^b	.75 (.78)
STEM word (yes/no) ^c	.91 (.88)
Email ($N = 760$)	
Proportion of STEM words ^a	.53 (.51)
Number of STEM words ^b	.83 (.82)
STEM word (yes/no) ^c	.91 (.90)

Note. Split-half reliability coefficients were calculated using the Guttman formula. The corresponding Cronbach's alphas for the total STEM dictionary are in parentheses. ^a Proportion of each STEM word as a percentage of a female student's total words written in a mentoring year. ^b Absolute number of each STEM word written by a female student in the mentoring year. ^c STEM word was or was not used by a female student at least once during the mentoring year.

Table A.5

Retest reliability coefficients (intraclass correlations) for students' STEM communication in forum, chat, and email

Forum, chat, & email	Sep/Oct (<i>N</i> = 173)	Oct/Nov (<i>N</i> = 156)
Proportion of STEM words	.42	.24
Number of STEM words	.75	.71
Forum	Sep/Oct (<i>N</i> = 20)	Oct/Nov (<i>N</i> = 27)
Proportion of STEM words	.64	ns.
Number of STEM words	.81	ns.
Chat	Sep/Oct (<i>N</i> = 22)	Oct/Nov (<i>N</i> = 26)
Proportion of STEM words	ns.	ns.
Number of STEM words	.87	.76
Email	Sep/Oct (<i>N</i> = 152)	Oct/Nov (<i>N</i> = 127)
Proportion of STEM words	.43	ns.
Number of STEM words	.62	.51

Note. Only coefficients are reported where at least 20 students contributed text posts at both time points.

Table A.6

Correlation coefficients for the relationship between students' automatically coded and self-reported STEM communication

Forum, chat, & email ($N = 256$)	Topic STEM ^a
Proportion of STEM words ^b	.35**
Number of STEM words ^c	.42**
Forum ($N = 256$)	Topic STEM ^a
Proportion of STEM words ^b	.27**
Number of STEM words ^c	.28**
Chat ($N = 256$)	Topic STEM ^a
Proportion of STEM words ^b	.50**
Number of STEM words ^c	.51**
Email ($N = 256$)	Topic STEM ^a
Proportion of STEM words ^b	.39**
Number of STEM words ^c	.43**

Note. Spearman rank correlation coefficients (two-sided); * $p < .05$; ** $p < .01$. ^a Self-reported communication about STEM-related topics during a platform visit (1 = yes; 0 = no). ^b Proportion of STEM words as a percentage of total words written by a female student during the survey period. ^c Absolute number of STEM words a female student wrote during the survey period.

Table A.7

Means, standard deviations, and mean differences for students' STEM communication ($N = 75$) in the subforums STEM-Talk and Casual Discussion

	STEM-Talk		Casual Discussion		Z^a	p
	M	SD	M	SD		
Proportion of STEM words ^b	2.74	2.76	0.49	0.80	-6.31	< .001
Number of STEM words ^c	6.08	8.34	2.28	3.07	-4.26	< .001

Note. ^a Z -value for the Wilcoxon test. ^b Proportion of STEM words as a percentage of total words written by a female student in the subforum. ^c Absolute number of STEM words written by a female student in the subforum.

Table A.8

Overview of the scales used in the questionnaire at the beginning (T₁) and end (T₂) of a mentoring year to measure mentoring outcomes

Scale	Number of items	Example item	Response format	α (T ₁ /T ₂)	Reference
Knowledge of STEM topics	3	„How do you assess your knowledge in STEM subjects?“	Scale from 0% (very low) to 100% (very high), in 5% intervals	.80/.84	Stoeger et al. (2013)
Knowledge about studies and occupations in STEM	8	„How much do you know about study and career opportunities in mechanical engineering?“	Scale from 0% (very little) to 100% (very much), in 5% intervals	.89/.88	Stoeger et al. (2013)
STEM interest	6	„I like STEM lessons.“	Six-point Likert scale from strongly disagree to strongly agree	.84/.90	Ziegler et al. (1998)
Confidence in one's own STEM abilities	4	“I doubt whether I am talented for STEM.” vs. „I consider myself talented for STEM.“	Six-step semantic differential	.87/.91	Dweck (1999), Dweck & Henderson (1989)
STEM activities	8	„Have you ever participated in a STEM competition?“	Four-point Likert scale from never to often	.81/.85	Stoeger et al. (2013)
STEM elective intentions	5	„I could imagine studying a STEM subject.“	Six-point Likert scale from strongly disagree to strongly agree	.82/.89	Ziegler & Stoeger (2008)

Table A.9

Results of stepwise regressions for the proportional STEM communication in the students' text contributions (N = 126)

		Mentoring-Outcomes T ₂											
		Knowledge of STEM topics		Knowledge about studies and occupations in STEM		STEM interest		Confidence in one's own STEM abilities		STEM activities		STEM elective intentions	
		β	(Δ)R ²	β	(Δ)R ²	β	(Δ)R ²	β	(Δ)R ²	β	(Δ)R ²	β	(Δ)R ²
Starting condition (T ₁) ^a		.35**	.20		.18		.41		.39		.38		.45
Starting condition (T ₁) ^a		.35**	.15	.42**	.18	.56**	.37	.54**	.36	.53**	.33	.54**	.40
Proportion of STEM words ^b	Forum					.20**	.04					.16*	.03
	Chat												
	Email	.22**	.05					.19*	.03	.23**	.05	.16*	.02

Note. Significance levels for beta coefficients: * $p < .05$; ** $p < .01$. ^a Starting conditions of the students according to the respective dependent variable at the second measurement point. ^b Proportion of STEM words as a percentage of a female student's total words written in a mentoring year.

Table A.10

Results of stepwise logistic regressions for proportional STEM communication in students' posts predicting their re-registration at the end of the mentoring year (N = 1,369)

		<i>B</i>	<i>SE</i>	<i>Wald</i>	<i>OR^a</i>
Proportion of STEM words ^b	Forum	.27**	.06	19.16	1.32
	Chat	.31**	.06	23.20	1.36
	Email				

Note. Significance levels for beta coefficients: * $p < .05$; ** $p < .01$. ^a Odds ratio. ^b Proportion of STEM words as a percentage of a student's total words written in a mentoring year.

Table A.11

Results of stepwise logistic regressions for the absolute number of STEM words in students' posts predicting their re-registration at the end of the mentoring year (N = 1,369)

		<i>B</i>	<i>SE</i>	<i>Wald</i>	<i>OR^a</i>
Number of STEM words ^b	Forum	.32**	.07	19.06	1.38
	Chat	.42**	.08	30.35	1.52
	Email	.41**	.09	22.05	1.51

Note. Significance levels for beta coefficients: * $p < .05$; ** $p < .01$. ^a Odds ratio. ^b Average number of STEM words written per female student in a mentoring year.