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Citizen science with Viennese high schoolers in the project 'VisibLL' – Outcomes, impacts, learnings

Barbara Soukup (University of Vienna)



"VisibLL – High school students explore the (in)visible multilingualism of the Viennese linguistic landscape"

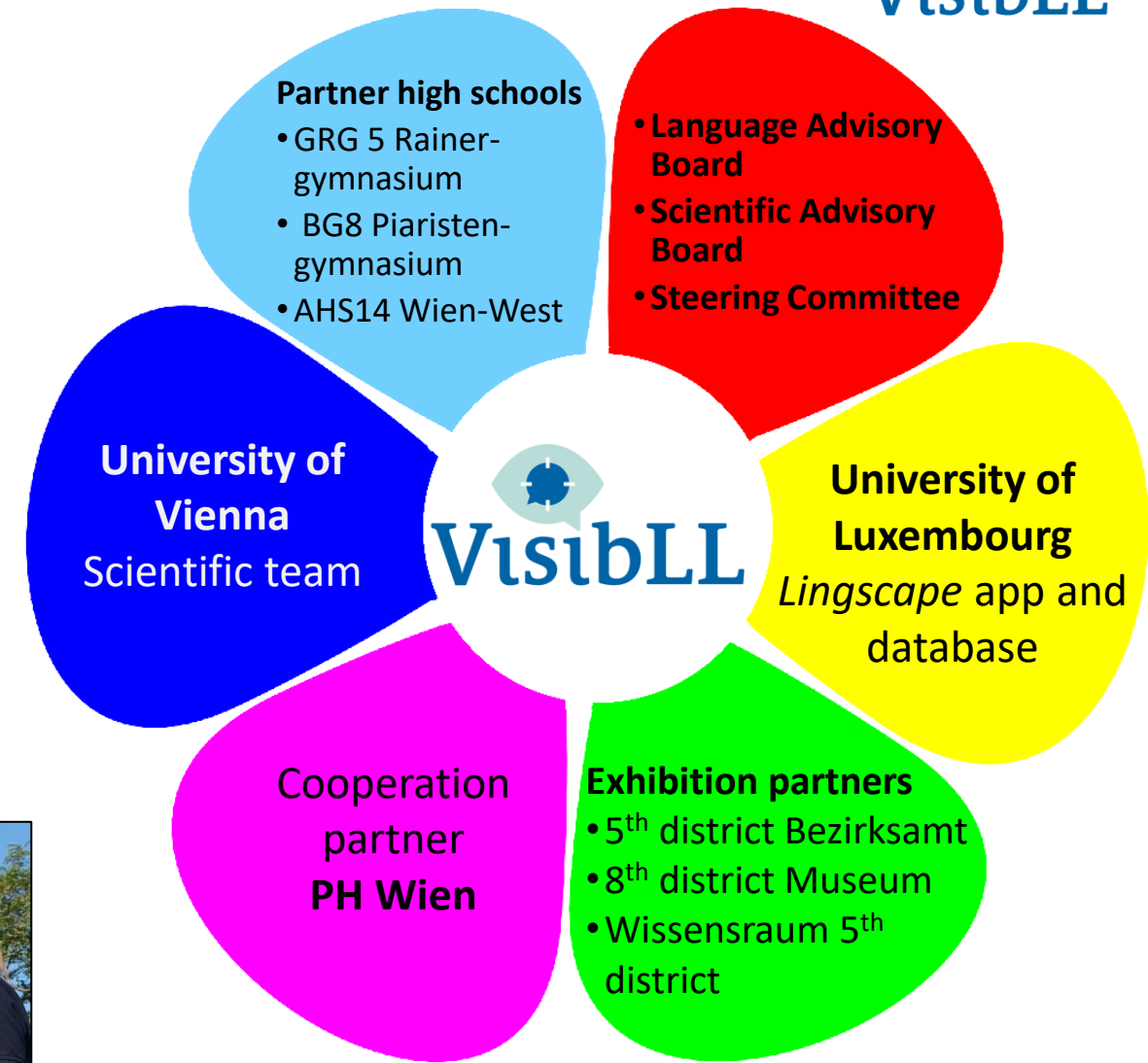
- **Funding period:** October 2022 – July 2025
- **Funding agency:**
Bundesministerium für Frauen, Wissenschaft und Forschung
(Austrian Federal Ministry of Women, Science and Research)
- **Funding program:** Sparkling Science 2.0 (# SPSC_01_146 – VisibLL)
- **Amount awarded:** € 338.637,58

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The full VisibLL team

- **Barbara Soukup** (Principal Investigator)
- **Elissa Pustka** (Co-Investigator, didactics focus)
- **Lisa Krammer** (project staff)
- **Sophia Seereiner** (project staff)
- **Barbara Tiefenbacher** (admin, event management)
- Teams of **student assistants** for the project work with high schoolers and for data processing



VisibLL's central goals

Linguistics

- **Documenting** and analyzing occurrences of **multilingualism** (migrant and foreign languages) **in the Viennese LL** under a **perception-based approach**



Science education

- **Enhancing** students' **awareness and appreciation** regarding **multilingualism** in public space
- **Introducing** students to linguistic **research methods**
- [**Designing teaching materials** for LL research with high schoolers]



VisibLL's central goals

Citizen Science

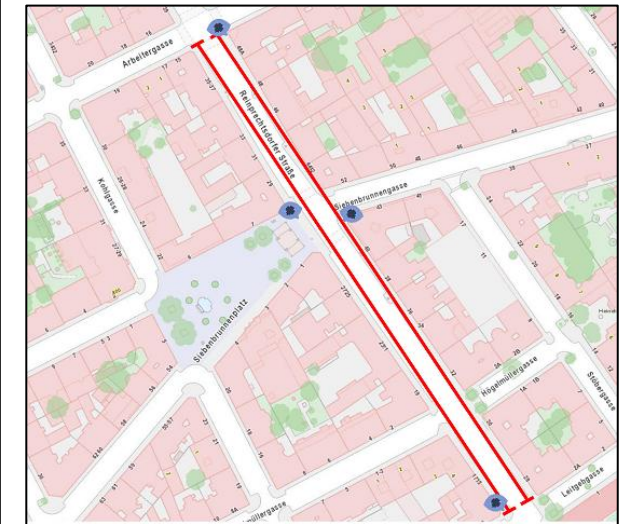
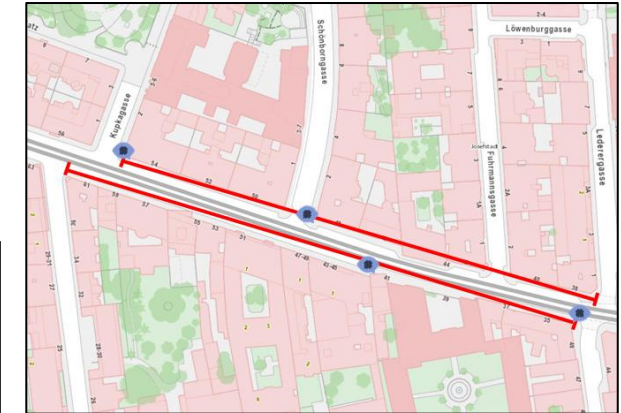
- "When democracy is being challenged, **science helps to develop better strategies and support citizens' involvement, social inclusion and equalities** in Europe. Political distrust, polarizing discourses, lower electoral participation and populist narratives call for a strengthened role of R&I [research and innovation] to overcome these difficulties." (European Commission 2020)
 - Citizen science is considered a remedy here, as it can supposedly engender **positive attitudes towards science, reduce science skepticism and facilitate the integration of scientific discourse with public discourse**, in the interest of strengthening democratic, participatory and diversity-tolerant dynamics of social coexistence and evidence-based public decision-making.
 - Policy makers place particularly high hopes in **CS with students as future decision-makers** and societal transformers > CS to teach scientific literacy and raise awareness of ecological, aesthetic, social and cultural values and challenges within society (Scheuch et al. 2021)
-

VisibLL's key citizen science activity: Data collection (photography and annotation) with *Lingscape*

Task description:

'Find and document NOT-German'

- 59 students (aged 15-17)
from two Viennese high schools
- Survey area: 200m shopping street
(one in each school district)
- Time limit: ca. 90min
- Tagging and annotating each picture for language(s)
identified



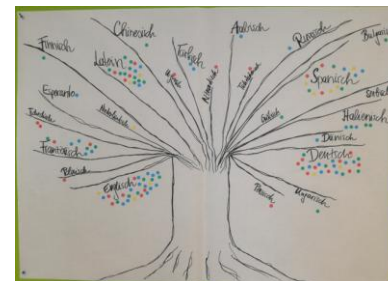
Contextualizing activities and data

Contextualizations and products from in-class reflection activities

Questionnaires, language portraits, language trees, focus group recordings, posters, project reports

2 public exhibitions

... designed by the students, showcasing their project work



Übers das Projekt VisibLL der Universität Wien
 Im Rahmen des Projekts VisibLL der Universität Wien
 wurde ein interaktives Projekt entwickelt, das die
 Sprachkenntnisse der Studierenden und der
 Lehrenden in der Universität Wien erheben und
 visualisieren soll. Das Projekt ist in drei
 Phasen unterteilt: 1. Erhebung der Sprachkenntnisse
 der Studierenden und der Lehrenden, 2. Analyse
 der Ergebnisse und 3. Visualisierung der
 Ergebnisse. Das Projekt ist ein Beispiel für
 die Nutzung von digitalen Technologien in der
 Sprachforschung und der Sprachlehre.

Outcomes, impacts and learnings (of the citizen science activities)

Outcomes, impacts, learnings

Linguistics

VisibLL *Citizen Science*-Korpus

- N=2260 (annotated) photos from 59 students under the assigned task ("Find NOT-German")

VisibLL Comprehensive LL Corpus for image matching

- N=4634 photos from an exhaustive documentation of the two survey areas (= 'what the students could have photographed')



"ITA: GUSTO -
Naturalmente
Gelato "



"ITA: alles"



"Ita: alles"



Outcomes, impacts, learnings

Science education

- Pre-/Post-/Follow-up questionnaire series

Pre+Post: N=55

Pre+Post+Follow-up: N=29

2. Persönliche Sprachverwendung

2.1 Kreuze an, wie sehr die folgenden Aussagen auf dich zutreffen bzw. nicht auf dich zutreffen!

	trifft voll und ganz zu	trifft eher zu	trifft eher nicht zu	trifft überhaupt nicht zu	weiß nicht
Ich bin mehrsprachig.	<input checked="" type="checkbox"/>				
Mehrsprachigkeit ist für mich persönlich ein wichtiges Thema.	<input checked="" type="checkbox"/>				
Ich erlebe meine Schule als mehrsprachige Schule.	<input checked="" type="checkbox"/>				
In meiner Klasse sind viele mehrsprachige Schüler*innen.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Ich sehe Sprachenvielfalt im Schulgebäude bzw. am Schulgelände (Plakate, Hinweistafeln, Werbung, Graffiti ...).	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
Ich erlebe Wien als mehrsprachige Stadt.	<input checked="" type="checkbox"/>				
Ich höre viele verschiedene Sprachen, wenn ich durch Wien gehe.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Ich sehe viele verschiedene Sprachen geschrieben, wenn ich durch Wien gehe.	<input checked="" type="checkbox"/>				
Ich denke oft über Mehrsprachigkeit nach.			<input checked="" type="checkbox"/>		
Ich finde es gut, wenn ich in Wien verschiedene Sprachen höre.		<input checked="" type="checkbox"/>			
Ich finde es gut, wenn ich in Wien verschiedene Sprachen geschrieben sehe.		<input checked="" type="checkbox"/>			

- 'Flashlight' feedback via red and green cards, speech bubbles

N=398

Schilder mit
verschiedenen
Sprachen zu finden 😊

Hitze
Sonne ☀

"Mir sind Sachen aufgefallen,
die ich davor noch nie gesehen
habe, obwohl ich fast täglich
an ihnen vorbeigehe. Jetzt muss
ich immer daran denken, wenn
ich daran vorbeikomme."

Results from the questionnaire series – Likert scales

Statement: “Ich sehe viele verschiedene Sprachen geschrieben, wenn ich durch Wien gehe.”

[I see many different languages when I walk around in Vienna.]

- 1 = I strongly agree
- 4 = I strongly disagree
- **Results:**

Day 1: M=2,18

Day 3: M=1,84


→ **Significant difference: students agreed more strongly on Day 3**
($t[54]=3,530$; $p<0,001$; Cohen's $d_z=0,48$)

→ **This effect is still in evidence one year later (M=1,76 for 29TN)**

2. Persönliche Sprachverwendung

2.1 Kreuze an, wie sehr die folgenden Aussagen auf dich zutreffen bzw. nicht auf dich zutreffen!

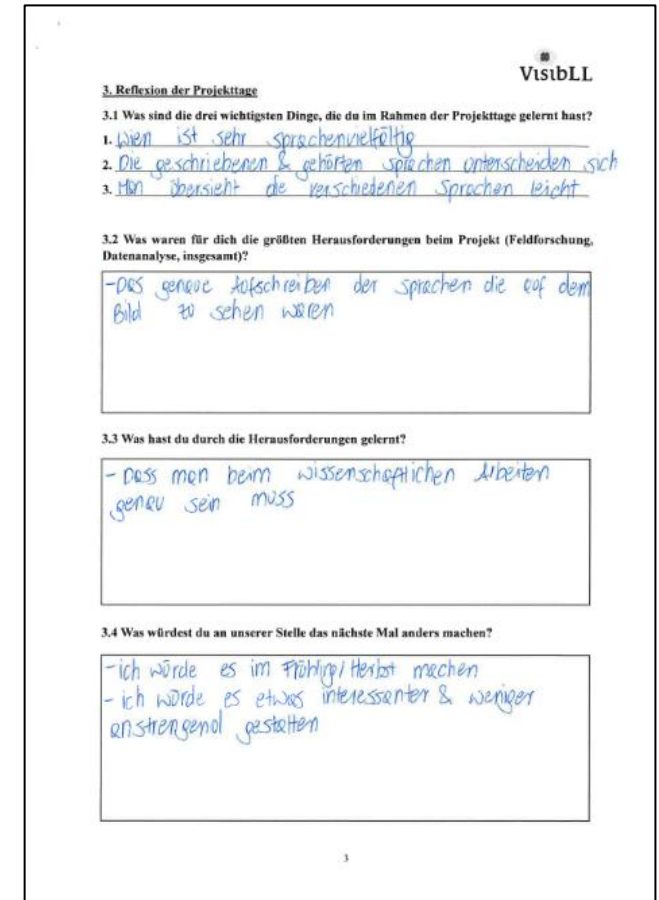
	trifft voll und ganz zu	trifft eher zu	trifft eher nicht zu	trifft überhaupt nicht zu	weiß nicht
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Results from the questionnaire series – open questions

- **Content analysis reveals the following recurring themes ("things learned" etc.):**

- Multilingualism
- English as dominating in the LL
- Noting the presence / absence of certain languages
- Differences between the auditory vs. visual LL
- Interest in 'ambilinguistic' words (*cafe, lift, garage*)
- Science as systematic investigation
- Everyday vs. scientific knowledge
- Increased attention to surroundings
- "Diversity is important"



3. Reflexion der Projektstage

3.1 Was sind die drei wichtigsten Dinge, die du im Rahmen der Projektstage gelernt hast?

1. Wien ist sehr sprachenvielfältig
2. Die geschriebenen & gehörten Sprachen unterscheiden sich
3. Man übersieht die verschiedenen Sprachen leicht

3.2 Was waren für dich die größten Herausforderungen beim Projekt (Feldforschung, Datenanalyse, insgesamt)?

- Das genaue Aufschreiben der Sprachen die auf dem Bild zu sehen waren

3.3 Was hast du durch die Herausforderungen gelernt?

- Dass man beim wissenschaftlichen Arbeiten genau sein muss

3.4 Was würdest du an unserer Stelle das nächste Mal anders machen?

- Ich würde es im Frühjahr/Herbst machen
- Ich würde es etwas interessanter & weniger anstrengend gestalten

3

Outcomes, impacts, learnings

Science education

- **Enhancing** students' **awareness and appreciation** regarding **multilingualism** in public space ✓
- **Introducing** students to linguistic **research methods** ✓

Caveats

Data quality

- Average p.p.: n=27 photos
Min=4, Max=106
- Target: 30 photos p.p.;
Target reached: 64%;
But: 17% betw. 25 and 30 photos;
5% fewer than 10 usable photos
- 64% of the students contributed 80% of the photos
- 78% of the photos were adequately annotated

> The VisibLL Citizen Science-Corpus does not represent the perceptions of each citizen scientist to the same degree.

Impact

- Impact along the science educational goals, still evident after one year
- The impact is evident in self-reports – but (to what extent) does this transfer into an expansion of self-efficacy and skill sets?
- Societal impacts are to be hoped for (trickle-up effects via the target group and public outreach activities) – but how to measure?

'Sticking points'

- **Motivation**

- > Recruitment (project participation as regular class)
- > Location (classroom vs. outdoor vs. at university)
- > Cumbersome task aspects (smartphone use, app use, annotation in *Lingscape*)

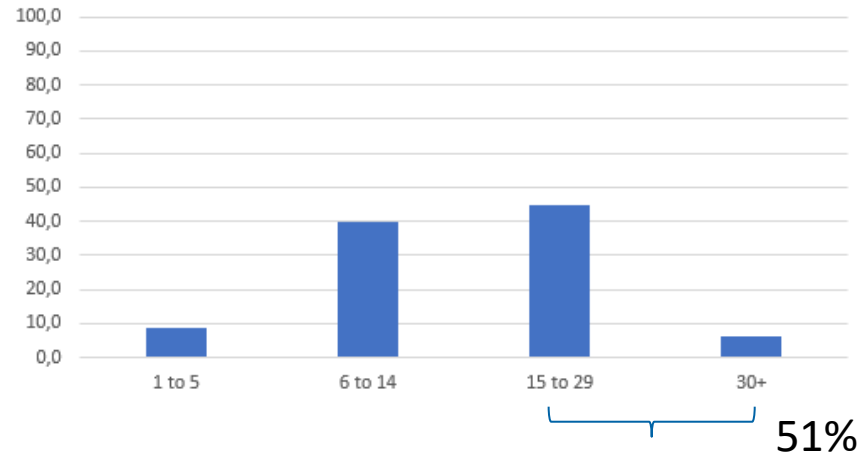
- **External circumstances** (timing, school as an institution, weather, budget)

- **Goals and expectations**

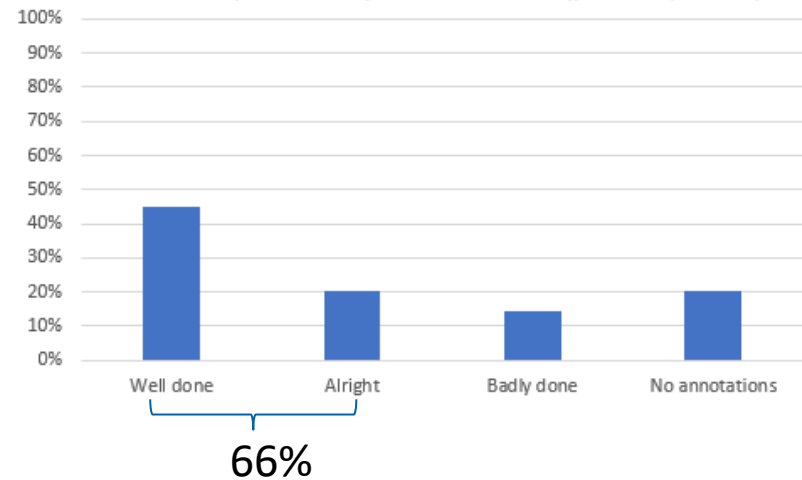
- > Hybridity of the project – “co-production” vs. “educational project with an explicit share of original research”*

*Rückert-John, Jana / John, René / Jaeger-Erben, Melanie / Wiatr, Magdalena / Vohland, Katrin / Ziegler, David / Göbel, Claudia / Talmon-Gros, Larissa / Teichler, Thomas / Bach, Nicolas / von Blanckenburg, Christine / Diemel, Hans-Liudger (2017): Konzept zur Anwendbarkeit von Citizen Science in der Ressortforschung des Umweltbundesamtes. Abschlussbericht. Dessau: Umweltbundesamt.

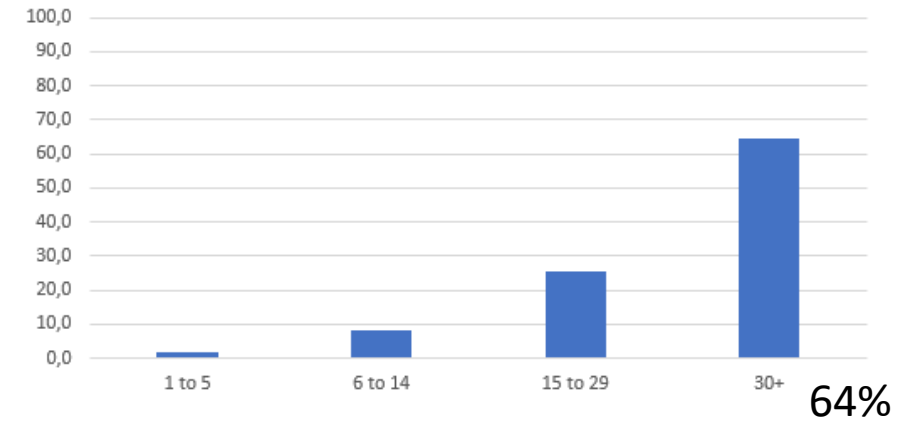
Day 1: Photos per person (percent, N=78, target: 15+)



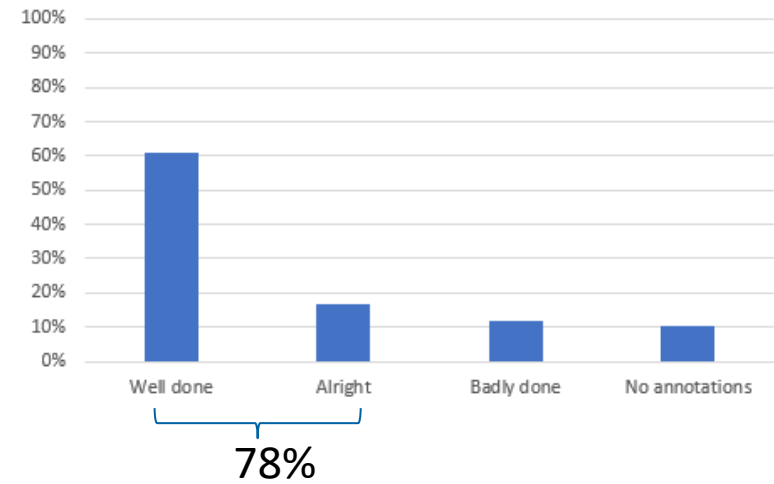
Day 1: Quality of annotation (percent, N=78)



Day 2: Photos per person (percent, N=59, target: 30+)



Day 2: Quality of annotation (percent, N=59)



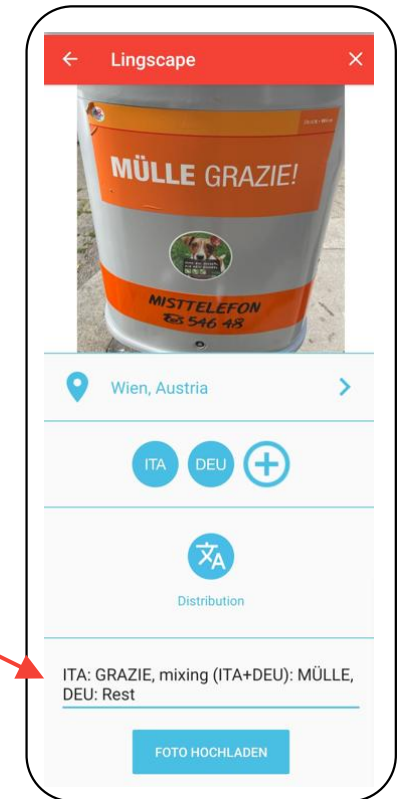
Extrinsic motivation to enhance compliance

- Stamp hunt
- A prize for the 'best' data collectors
 - **Selection criteria:**
 - **Quantity:** Number of photographs
 - **Quality** of data annotation (= language tagging, commenting)
 - **Diversity** of the collected data (languages, item types)

- **Prizes:**

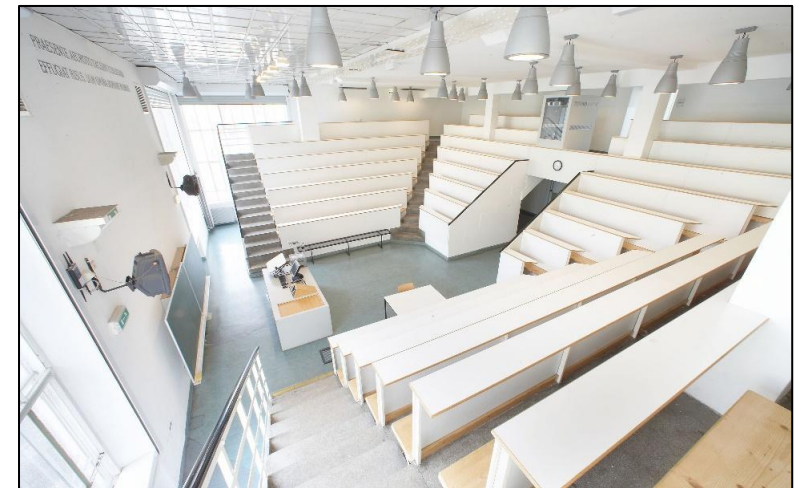
First place: 50€ Amazon gift certificate

Two second places: 2x25€ Amazon gift certificate



Learnings

- Extrinsic motivation works (gamification, prizes, assessment of attendance/ performance)
- Intrinsic motivation is highly divergent among participants
 - > requires resources (staff) and explicit management (> teachers)
- Location effects (school vs. university)
- Outdoor effects (weather and respective equipment)
- Teachers are a vital factor for success (as facilitators in the institutional context)
- Setting clear, compatible goals
 - > Squaring scientific and didactic expectations



According to the 'prototypes of citizen science' identified by Rückert-John et al. (2017), VisibLL is a hybrid:

"Co-production"	"Educational projects with an explicit share of original research"
Participation of volunteers in the research process under the instruction of institutionally embedded scientists, typically in probe/data collection and/or analyses.	...feature a close connection between learning and science, where the process of raising awareness, changing behavior, or gaining knowledge is considered at least as important or more important than the scientific results.

Scientific rigor ↔ Participatory decision-making increases engagement
Engaging students with low 'scientific capital'

Conclusions

- On the whole, VisibLL was successful along its science educational goals.
- The impact is evident in self-reports – but it remains unclear whether and to what extent this transfers into an expansion of self-efficacy and skill sets.
- Societal impacts are to be expected (trickle-up effects via the target group and public outreach activities) – but how to measure?
- Extrinsic and intrinsic motivation ('having a say/stake' in proceedings) play a great role for the outcome – but this is where scientific and educational goals may not neatly dovetail.



Sprachen es eigentlich im öffentlichen
Raum in Wien gibt.

Ich habe an den
Orten / Tafeln Sprachen gefunden in
meinem Privatleben.

Ich habe mich
verwundert, dass wir
so viel Deutsch gefunden
haben

Nach dem ich meine eigene Sprache in
der Stadt gefunden habe, fühlt sich die
Stadt mehr wie zu Hause an.

„Ich öffne mein
ich auf

AK.

Ich war verwundert wie viele verschiedene
Sprachen im 5. Bezirk vertreten sind.

„Es gibt viel mehr Mehrsprachigkeit
Schriftzüge auf den Straßenschildern
wenn es sich

projektvisibl1.germanistik@univie.ac.at
<https://projektvisibl1.univie.ac.at>



Please visit our
virtual exhibitions!



References

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 - Soukup, Barbara (2020): „Survey area selection in Variationist Linguistic Landscape Study (VaLLS): A report from Vienna, Austria“, in: *Linguistic Landscape* 6(1), 52-79.
-

Appendix

Implementing the VisibLL key activity: 3 project days (June 2023)

Period	Day 1	Day 2	Day 3
1	<ul style="list-style-type: none">• Introduction: What is science• Pre-questionnaire	Field guide (recap / specification)	<ul style="list-style-type: none">• Photo questionnaire• Input on the axes of analysis:<ul style="list-style-type: none">- Language dynamics and language contact- Sociology of language
2	<i>Lingscape</i> app Field guide	In 2 groups: <ul style="list-style-type: none">- Data collection 2: Detailed documentation of 200 m of a commercial street (Task: Find 'NOT-German')- Language portraits, 'language tree'	
3	Data collection 1:		Focus group discussions: <ul style="list-style-type: none">- LL agents- Associations with languages- Utopias & dystopias
4	Exploration of the district in groups (Task: Find 'NOT-German')		
5	Debriefing / Feedback	Debriefing / Feedback	Post-questionnaire
6			Project reports/posters
7	Staff debriefing (minutes & reports)	Staff debriefing (minutes & reports)	Staff debriefing (minutes & reports)
8			

What are the top five languages (outside of German) occurring in our district?

VisibLL 200m shopping street survey: Top 10 non-German languages



> Pre-fieldwork expectations (5th and 8th district)

5 th district: 1139 photos/items			8 th district: 1121 photos/items		
Language	n	%	Language	n	%
English	852	74.8%	English	819	73.1%
Ambilinguistic	159	14.0%	Italian	132	11.8%
Italian	81	7.1%	Ambilinguistic	123	11.0%
French	50	4.4%	French	118	10.5%
Other	49	4.3%	Other	71	6.3%
Chinese	18	1.6%	Spanish	22	2.0%
Turkish	17	1.5%	Japanese	18	1.6%
Japanese	15	1.3%	Latin	13	1.2%
Arabic	8	0.7%	Chinese	7	0.6%
Latin	8	0.7%	Greek	7	0.6%

Five prototypes of citizen science (Rückert-John et al. 2017)

“Co-design and production-oriented research”	Societal and scientific actors mutually develop and conduct a project. It is initiated either by scientists or citizens. Goals and methods are determined together.
“Co-production”	Participation of volunteers in the research process under the instruction of institutionally embedded scientists, typically in probe/data collection and/or analyses.
“Educational projects with an explicit share of original research”	feature a close connection between learning and science, where the process of raising awareness, changing behavior, or gaining knowledge is considered at least as important or more important than the scientific results.
“Virtual contribution”	citizen scientist participate in the generation and in particular the analysis of digital data. [...] A special form is “gaming” where the analysis of digital data takes place via computer games.
“Autonomous research”	individual persons or non-governmental organizations develop and conduct a research project independently of scientific institutions.