academic quarter
akademisk kvarter
research from the humanities
AAU

Volume 31. Autumn 2025

Collaborative language learning through generative AI

The case of French

Bente Meyer

is an associate professor in ICT and learning at the Department of Culture and Learning, Aalborg University, Copenhagen. Her research focuses on emergent changes in schooling formed by educational uses of technologies in e.g. language learning.

Annette Søndergaard Gregersen

is Senior associate lecturer at University College Copenhagen at the Faculty of Teacher Education and has published on culture pedagogy in language teaching and learning with a focus on French as a foreign language in Denmark. She is currently conducting research concerning GenAI, sustainability, playful learning, and practical subject knowledge in lower secondary schools in Denmark.

Abstract

The introduction of generative AIs to education has reinitiated discussions of how humans are involved with technology and how altered human-AI collaboration transforms education. In this paper we investigate shifted material relationships and ecologies of language learning through a project in which teacher students were introduced to generative AIs and experimented with ways in which they could be used in classrooms as part of placements in schools. The paper draws on classroom observations and interviews with teacher students in order to understand how prospective language teachers reflect on and use generative AIs, and on sociomaterial perspectives to understand how classroom didactics are formed by these uses. Our analysis centers on a specific example of how French was taught to 6th formers using text and image generation in a complex material set-up that connected natural artefacts with AI technologies to teach children French vocabulary.

Keywords: language learning, generative AI, sociomaterial perspectives

Introduction

In this paper we investigate ways in which generative AIs (GenAIs) become part of the dynamics of teaching French to 6th formers, following a research and development project in which teacher students were introduced to GenAIs and experimented with ways in which they could be used in classrooms[1]. Our research addresses a growing need for empirical understandings of how GenAIs enter, form, and affect schooling (Bruun et al. 2024). GenAIs enable collective learning processes as they are technologies that offer enhanced production of automated text, translation and creation of images through prompting, thereby blurring the boundaries of human and digital agency (Thorne 2024). In the paper we investigate these human-AI collaborations in the context of sociomaterial practices of language learning, in which GenAIs are organized, connected and hybridized with other actors in the classroom.

Theoretical considerations

In working with generative AIs in language learning we draw on sociomaterial approaches recently introduced into research in language education. These are theoretical frameworks that can help us analyse collaborative human-AI relationships that challenge existing human-centered perspectives in education. Studies by for instance Godwin-Jones (2024), Thorne et al. (2021), Ou et al. (2024), Toohey (2018), Pennycook (2018), Meyer (2024), thus from various perspectives both critique and explore issues of cognition, sociality and human agency central to the fields of second language learning and linguistics drawing on sociomaterial approaches. Central to these contributions is a posthuman perspective that challenges human-centric ways of thinking involved in language learning (Ou et al. 2024). Following a relational approach to language learning, sociomaterial approaches investigate particular arrangements in practice that involve both human and non-human actors, e.g. teachers and pupils as well as technologies, tables, chairs and multiple artefacts involved in learning. What sociomaterial studies have brought to research in language learning is therefore both problematizations of the idea that language resides in individuals'

minds or in social interactions, and enhanced perspectives on the significance of materiality in learning, including the materiality of language itself (McLure 2013; Sørensen 2009).

With regard to the study of GenAIs in language learning sociomaterial approaches contribute with analytical perspectives on intensified, collaborative relationships between humans and technologies in learning. Godwin-Jones (2024) significantly describes these changes as *dynamically shifted ecosystems for language learning* initiated by the integration of GenAI in teaching and learning as GenAIs have the capability to perform social actions (e.g. writing) usually associated with human actors. As digital actors, GenAIs thus challenge existing concepts of agency and intelligence.

In addition to analyzing the role of agency we focus on the role of *translation* in our data as translation appeared as a general principle for teaching French vocabulary. Thus, the teacher students we observed used a didactic principle of exposing pupils to multiple repetitions of the chosen vocabulary, building on the idea that learners need to encounter vocabulary repeatably and in different contexts in order to learn (Stæhr 2019). Translation therefore involved integrating French vocabulary into multiple spaces, materialities and activities, including machine translation and image generation through GenAI (Vinall and Hellmich 2022; Vartiainen and Tedre 2023).

In analysing processes of translation involving GenAI, we draw on Leander and Lovvorn (2006), who from a sociomaterial perspective explore how literacy practices shape educational environments. Drawing on Latour (1999), Leander and Lovvorn define translation as a dynamic of practice in which actants are transformed by relationships to other actants in the network of practice. To be an actant therefore means "…shifting in space and time, which involves the translation of actants as they circulate, are recruited, organized, and hybridized with other actants" (2006, 296). Translations in this understanding define classroom rhythms, as Leander and Lovvorn in their study observed how teaching often required that pupils moved texts from one material-textual space to another, e.g. from the whiteboard or a textbook to the space of their own printed pages. These sociomaterial relationships translated pupils' work into routinized activities in which pupils' agency was often limited. We argue that a similar rhythm can be observed in our data, however,

learner-centered didactics to some extent altered this rhythm, with GenAIs providing both enhanced productivity and automated productions of language through pupils' prompting.

Data and methodological considerations

Our analysis draws on observation data and group interviews from a project in which teacher students worked with generative AIs in their classes at teacher college and in their practicums in elementary schools (Hasse 2011; Halkier 2020). The purpose of the project was to enhance teacher students' awareness and didactic engagement with GenAIs, as future teachers need to critically engage with the uses of GenAI in schooling.

In the project GenAIs were introduced into teacher students' everyday learning rhythms in the course of two semesters in 2024, where we followed two classes of English students and one of respectively German and French students. Both independent platforms such as ChatGPT and Copilot and integrated AI functions in Padlet (image generation through "I can't draw") were used. As teacher students need to work with data-safe material in schools, we also chose to work with SkoleGPT, a GPT developed by the participating teacher college to use in schools (skolegpt.dk).

In addition to workshops and observations, we did fieldwork in schools, using observations in classrooms and subsequent interviews to understand students' uses of GenAIs in schools with pupils. Thus, the students' semesters were characterized by their shifting participation in courses at teacher college and in specific schools where they were in practicum. Multisited ethnographies (Marcus 1995) of these movements were therefore central to our research, as they enabled us to trace emergent configurations and relationships between generative Ais and language learning.

In this article we focus primarily on classroom observations of two lessons in a 6th form class, where the following GenAIs were used together with other learning materials to teach French vocabulary: SkoleGPT (text-to-text translation Danish to French) and Padlet's image generator (prompted French text to image generation).

Into the field – French as a school subject

In Denmark, French is, depending on pupils' choice, a second or third foreign language that is taught from the 5th form[1]. In schools, French is often taught in small groups of pupils who may have been brought together from different classes or different schools, as not all schools have French teachers. French thus emerged as a significant case for this paper, as we were interested in studying how generative AIs can contribute to the teaching of a language that has a relatively marginal position in the curriculum, and which is generally not supported by pupils' access to the language in their immediate environment.

In the teacher's college we followed two teacher students, who were working together in their practicum period at a suburban school near Copenhagen. Data from this part of the research were learning materials the teacher students shared with us, observations of two French lessons in a sixth form class, and two interviews with the teacher students. The first interview was made right after the lessons observed, in which the teacher of the French class was also present, and a second interview was made a couple of weeks after the teacher students had repeated the lessons with a 7th form class, which we unfortunately were unable to participate in. Interviews were based on the teacher students' narratives of their didactic ideas and on reflections on the lessons observed, with a specific focus on how and why they had chosen to use GenAI.

Didactic perspectives and the role of GenAI

In working with generative AIs in French the teacher students chose to support the pupils' engagement in French by associating it with multiple both technical and natural phenomena and by focusing on pupils' production of language and aesthetic products. Didactically, the teaching was as mentioned based on a principle of repetition, the purpose of which was to help pupils both remember and use words in specific contexts (Stæhr 2019). Thus, French vocabulary was circulated in a number of different contexts, which connected French vocabulary with both natural objects and generative Ais and which allowed pupils to work with language both receptively

1 From the school year 2025/2026 French will be offered as a compulsory second language taught from the 6th form

(e.g. reading) and productively (e.g. writing). Teaching activities were scaffolded by the teacher students in various ways, e.g. by using printed vocabularies and by supporting pupils' prompting in class.

First of all, the teacher students had a specific focus on moving the teaching out of the classroom by situating some of the lessons in nature (Hartmeyer and Præstholm 2021). The purpose of this strategy was to allow the pupils to be physically active and use their senses while learning French. Thus, the teacher students had planned lessons in the classroom that included materials from a nature project made the week before in a nearby bog-area. During this outing, pupils foraged for feathers, leaves and twigs to create Mandalas, a geometric shape representing the universe and used for e.g. meditation, relaxation and creativity (Perplexity AI 2025). In creating the Mandalas, the pupils were introduced to French vocabulary relevant to the outing and the making of the Mandalas. A printed plastic covered sheet of vocabulary entitled *Vocabulaire sur la forêt* illustrated with images was brought into the outing and used for identifying objects in nature (fig. 1). In class,

	Une branche	[brongsj]
	Une baguette	[bagæt]
	Un tronc d'arbre	[tråŋk darbr]
	Un arbre	[arbr]

Figure 1. Examples of French vocabulary from the sheet used in the outing to the bog[2]

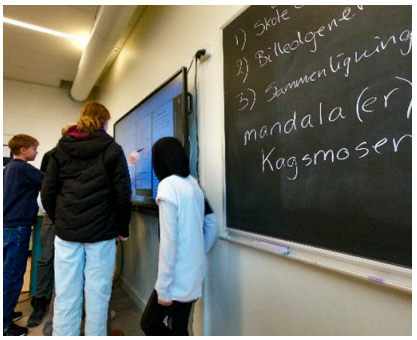
the work of engaging with vocabulary by relating it to objects was engaging with vocabulary by relating it to objects was extended, as the outing and creation of the Mandalas was integrated into a complex dynamic of translating vocabulary into text and images, some of which were AI-generated.

The two lessons we observed were divided into four activities, two of which were GenAI-based. The first activity was a warm-up and served as a recall of the outing made to the bog. Pupils were organized in pairs and were asked to talk about what happened in the outing. The pupils were then asked to write a story in Danish about their outing, which was to be used in the next activity.

Figure 2. Pupils' Mandalas made from objects in nature and a GenAI-created Mandala (right) based on the natural Mandala (left)

Activity two focused on the pupils uploading their story to SkoleGPT and prompting the chatbot to translate their story from Danish into French. The translated stories were subsequently shared on a Padlet which was exhibited on the classroom smartboard. For the third activity pupils were invited to come up to the smartboard and put a circle in red around the French words they recognized and knew (figure 3). A brief plenary session where pupils were invited to talk about the vocabulary they identified ended the third activity and in many cases provided a recall of vocabulary used in the original outing. The fourth activity, which was initiated in the second lesson, involved a recreation of the Mandala made in the bog using Padlets' GenAI function. For this activity pupils were asked to prompt the image generator to create images that represented their

Mandalas in as much detail as possible (figure 2). This entailed using French words for numbers and for objects used in the Mandala, for instance "three feathers", "four sticks" etc. Throughout the work with GenAI (SkoleGPT and Padlet) the teacher students scaffolded pupils' activities by suggesting ways of prompting, ie examples of prompts were written on the blackboard next to the smartboard. Finally, the Mandalas were compared in class to see how pupils had succeeded in using French for prompting an AI-representation of their original Mandalas.



La semaine dernière, j'étais en forêt et moi et mon ami avons sauté au-dessus d'un ruisseau, mais sa jambe droite est tombée dans l'eau. Afin de l'aider, j'ai cherché une solution et nous avons créé un mandala avec des feuilles et des branches. C'est une

Figure 3. Pupils noticing vocabulary from GenAI-translated text (right)

Analysis

Dynamics of translations and circulations

Observations of the class activities revealed a number of translations and circulations of materials that established connections across heterogeneous learning spaces. Circulations included multiple relationships between natural and digital materials (e.g. twigs, leaves and AI generated texts), reinventions and reconfigurations of objects (e.g. AI generated images of the Mandalas) and identifications and translations of natural objects as well as (Danish) text (into French). In these circulations of different materials pupils produced both aesthetic representations of collected objects (the Mandalas), reinventions of these collections (the AI generated Mandalas) and vocabulary, texts and stories in Danish and French (and other languages as well). In these activities, however, pupils did not act alone, but were part of extensive arrangements in which GenAIs, Padlets and the smartboard formed learning practices.

As described above translation was a general principle of the teacher students' teaching, as French vocabulary was repeatedly

circulated between different learning spaces and materialized in different ways. First of all, French vocabulary (the printed vocabulaire) contributed to translating objects in nature by providing pupils with words and images for the things they collected and identified to make the Mandalas. In turn, objects found in nature by the pupils were translated into Mandalas, i.e. aesthetic objects that materialized and situated French vocabulary in ways that made it more playful and embodied. Moving into the classroom, translations of the natural environment and pupils' experience with it were enacted through stories in Danish that were transformed into text and subsequently into French by using SkoleGPT. Interestingly, many of the pupils did not have prior experience with SkoleGPT (or other AI technologies) and therefore experimented with the GPT by transforming their story not only into French, but also, we observed, into eg Japanese and Chinese. One pupil who had a Somali background, proudly showed us by pointing to his screen that SkoleGPT had been able to translate his and his classmate's story into Somali. In this way SkoleGPT generated translations that engaged pupils' awareness of languages as well as their feeling of identity.

Subsequent translations were made in the classroom by sharing stories in French through Padlet and the smartboard and by translating natural objects and Mandalas into AI generated images. Thus, translations operated through the mobilization and relationship of several materials and activities and were not only language and text borne but multimodal.

In this complex chain of relationships and heterogeneous configurations translation served a number of purposes that enhanced the teaching and learning of French as follows. First of all, chains of interwoven activities created rhythms of repetition, in which vocabulary was continually reenacted, but in new ways to both didactically maintain and vary learning over time. Using multiple modalities (text, visuals, both AI-generated and learner-generated) for instance materialized French vocabulary in different ways, linking eg the aesthetics of Mandalas to French words for numbers (see fig 2 & 3). Secondly, heterogeneous relationships served to organize and hold together activities across time and space, thus connecting for instance the natural environment with the classroom. Observations in the classroom showed that pupils had enjoyed the outing to

the bog, but that some of them struggled with recalling the specifics of the trip. Producing the copied vocabulaire and images of the pupils' Mandalas in class helped pupils recall, and subsequent translations of the outing and its gathered materials reenacted the outing in new ways.

Finally, chains of translations connected French with activities and materials that were unusual to the teaching and learning of French. As mentioned above, Danish pupils do not have access to French in their immediate environment, however, the outing to the bog established French as part of the local natural environment. In addition to this, SkoleGPT gave pupils access to French through translation, and thereby enabled them to produce more (written) language than they would have been able to produce on their own, as beginners.

Agencies and collaborations

Our empirical example has identified ways in which French vocabulary became involved in complex ecosystems for the teaching of French as well as extending its reach beyond the classroom. Complex ecosystems of teaching French thus involved shifting forms of agency, in which pupils were positioned as both producers of language and of images, but also as co-authors and co-creators with generative AIs. At the outset, the teacher students had, as mentioned, planned the activity as one in which pupils were meant to be actively involved. Using nature as a learning environment for instance positioned pupils as actively involved in discovering and engaging with nature while learning French. Learner agency was also supported by the making of the Mandalas which was planned to support aesthetic learning.

GenAI thus entered and participated in complex ecosystems in which vocabulary was continually circulated and which created multiple environments for learning French vocabulary. Agency was in these shifting learning environments collectively enacted, as heterogeneous (digital and analogue) materials worked together with pupils and their student teachers to create potentials for learning. Looking specifically at the GenAIs incorporated into these ecosytems, we can argue that translating pupils' text with SkoleGPT provided enhanced and personalized textual production that could not have been created by pupils alone. Pupils' collaboration with

SkoleGPT thus produced automated writing that significantly exceeded their capacity for writing in French as beginners in terms of both the scale and variation of vocabulary used (see fig 3). This was confirmed by the interviews with the teacher students who described the pupils' vocabulary as limited. The production of personalized text for noticing French vocabulary was therefore a collective endeavor, involving both teacher students' drafted prompts on the blackboard, pupils' prompting and translations of text into multiple languages and SkoleGPT's machine translation. In this co-production of automated text and pupils' prompting, pupils were positioned as producers of text based on their personal stories but were also part of SkoleGPT's automated text creation that moved agency from the pupil(s) to the arrangements involving the teachers, the blackboard, and SkoleGPT. Significantly, these relationships were only partly reflected on by teacher students and pupils in the classroom, where pupils' texts were primarily used for noticing vocabulary, and machine translation was therefore to some extent seen as a transparent activity.

With regard to the production of Mandalas, Padlet's GenAI function became significantly involved in (re)creating pupils' natural Mandalas, producing a different configuration of aesthetic creation than that of the outing. Producing Mandalas through GenAI was thus driven by relationships between Padlet's algorithms, pupils' prompting with French vocabulary and teacher students' prompt drafts written on the blackboard. Rather than engaging in the process of being and foraging in nature, the creation of Mandalas in the classroom was therefore an activity involving pupils, teachers and AI functionalities, resulting in a multimodal expression of co-creation. Though sociomaterial relationships were involved in both activities of creation (in nature and in the classroom), prompting Padlet's image generator placed Padlet's algorithms at the center of creative agency, thereby distributing the creative process between humans and GenAI. Thus, though pupils to some extent created images of their mandalas by prompting the image generator, specific color choices and other visual outcomes were formed by the AI (see fig. 2).

As with the production of text described above, the significance and effect of these shifted agencies was only partially reflected on in the classroom, where teacher students and pupils primarily dis-

cussed how AI-generated Mandalas compared to the Mandalas created in nature, ie the activity focused on the aesthetic products and the target language rather than the contribution of the GenAI technology. Though this in many ways makes sense in the context of teaching French to 6th formers, it also raises the question of how we can address the (co)agencies of GenAI in education, and specifically in language education, where prompting and multimodal production is intimately associated with linguistic competence and agency.

Discussions and conclusions

In this paper we have used sociomateriality as an analytic concept to understand how generative AIs are enrolled in schooling and become collaboratively involved with pupils and teacher students in the classroom. Following a specific example of how French was taught to 6th formers we have argued that GenAIs should be seen as part of the arrangements that make up the specific rhythms and spatial configurations of teaching in schools. This is significant as focusing on GenAI as defined relationally by specific practices will help us understand how these technologies contribute to and transform e.g. student agency in language learning. Thus, our example shows how teaching French vocabulary became a complex sociomaterial activity, where vocabulary was circulated in different ways to support pupils' continuous engagement with French as a target language. Based on Leander and Lovvorn we argued that the circulation of French vocabulary became an act of translation, where vocabulary became *recruited, organized, and hybridized with other actants* (2006, 296) to create both variation and cohesion in teaching and learning. GenAIs became part of these circulations and in significant ways contributed to shifts in the ecology of language learning by both enhancing and automating the creation of text and images used in teaching. As described above, GenAIs therefore became significant actors and collaborators in producing text and imagery in the classroom. However, the process and effect of engaging collaboratively with GenAIs was not clearly addressed by the teacher students as part of the teaching. This raises issues of how we can incorporate reflections on the changing agencies of producing and learning a language in a society increasingly affected by GenAI.

References

Bruun, Maja Hojer, Jakob Krause-Jensen, and Cathrine Hasse. 2024. "Store sprogmodeller og AI-chatbots på videregående uddannelser." *Pædagogisk Indblik* 26. DPU, Aarhus Universitet. https://dpu.au.dk/fileadmin/edu/Paedagogisk_Indblik/AI_paa_videregaaende_uddannelser/26_Store_Sprogmodeller_og_AI-chatbots_paa_videregaaende_uddannelser_-11-12-2024.pdf.

Godwin-Jones, Robert. 2024. "Distributed agency in second language learning and teaching through generative AI." *Language Learning & Technology* 28 (2): 5–31. https://doi.org/10125/73570.

Halkier, Bente. 2020. "Fokusgrupper." In *Kvalitative metoder. En grundbog*, edited by S. Brinkmann and L. Tanggaard. Hans Reitzels Forlag.

Hartmeyer, Rikke, and Søren Præstholm. 2021. *Børns naturdannelse: Naturen i barnet – barnet i naturen*. Institut for Geovidenskab og Naturforvaltning, Københavns Universitet.

Hasse, Cathrine. 2011. *Kulturanalyse i organisationer – begreber, metoder og forbløffende læreprocesser*. Samfundslitteratur.

Johri, Aditya. 2022. "Augmented sociomateriality: implications of artificial intelligence for the field of learning technology." *Research in Learning Technology* 30: 2642. http://dx.doi.org/10.25304/rlt.v30.2642.

Latour, Bruno. 1999. "On recalling ANT." *The Sociological Review* 47 (1_suppl): 15-25. https://doi.org/10.1111/j.1467-954X.1999.tb03480.x (Original work published 1999)

Leander, Kevin. M., and Jason F. Lovvorn. 2006. "Literacy networks: Following the circulation of texts, bodies, and objects in the schooling and online gaming of one youth." *Cognition and Instruction* 24 (3): 291–340. https://doi.org/10.1207/s1532690xci2403_1.

Marcus, George. E. 1995. "Ethnography in/of the world system: The emergence of multi-sited ethnography." *Annual Review of Anthropology* 24 (1): 95–117. https://doi.org/10.1146/annurev.an.24.100195.000523.

MacLure, Maggie. 2013. "Researching without representation? Language and materiality in post-qualitative methodology." *International Journal of Qualitative Studies in Education* 26 (6): 658–667. https://doi.org/10.1080/09518398.2013.788755.

Meyer, Bente. 2024. "Playful dramatizations–doing German the Nordic way." *Nordisk tidsskrift for pedagogikk og kritikk* 10 (5): 76–89. http://doi.org/10.23865/ntpk.v10.5991.

Ou, Amy Wanyu, Christian Stöhr, and Hans Malmström. 2024. "Academic communication with AI-powered language tools in higher education: From a post-humanist perspective." *System* 121: 1–14. https://doi.org/10.1016/j.system.2024.103225.

Pennycook, Alastair 2018. "Posthumanist Applied Linguistics." *Applied Linguistics* 39 (4): 445–461. https://doi.org/10.1093/applin/amw016.

Perplexity AI. 2025. "Mandala." Accessed May 26, 2025. https://www.perplexity.ai/search/mandala-ev67EIWST.uFlL-DcPIwRUg.

Stæhr, Lars Stenius 2019. "Ordforrådstilegnelse – fundamentet for kommunikativ kompetence." In *Sprogfag I forandring. Pædagogik og praksis. Bind 1*, edited by A. Søndergaard Gregersen.

Sørensen, Estrid 2009. *The materiality of learning: Technology and knowledge in educational practice*. Cambridge: Cambridge University Press.

Thorne, Steven L. 2024. "Generative artificial intelligence, co-evolution, and language education." *Modern Language Journal* 108 (2): 567–572. https://doi.org/10.1111/modl.12932.

Thorne, Steven L., John Hellermann, and Teppo Jakonen. 2021. "Rewilding language education: Emergent assemblages and entangled actions." *The Modern Language Journal* 105 (1): 106–125. https://doi.org/10.1111/modl.12687.

Toohey, Kelleen 2018. *Learning English at School: Identity, Socio-material Relations and Classroom Practice*. Multilingual Matters. https://doi.org/10.21832/TOOHEY0087.

Vinall, Kimberley, and Emily Hellmich. 2022. "Do you speak translate?: Reflections on the nature and role of translation." *L2 Journal* 14 (1): 4–25. https://doi.org/10.5070/L214156150.

Vartiainen, Henriikka, and Matti Tedre. 2023. "Using artificial intelligence in craft education: Crafting with text-to-image generative models." *Digital Creativity* 34 (1): 1–21. https://doi.org/10.1080/14626268.2023.2174557.

Notes

1 The project was financed by *The Danish National Centre for Foreign Languages* (NCFF)

2 The two students have chosen to create a transcription that is phonetically as spoken for students in a Danish school context