"Listen to my story, play and interact": Greek preschool children learning English in a digital environment

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Given the constantly changing social and educational landscape and the continuous advances in technology for learning/ teaching purposes, the question of what constitutes appropriate literacy pedagogy in a modern educational context has been raised by a number of researchers (see Kaminski, 2019; Kalantzis & Cope, 2012). This paper argues in favor of integrating a multimodal approach into foreign language (FL) teaching to very young learners. An innovative educational program was designed and implemented to 26 preschoolers with the ultimate purpose of examining the potential of digital storytelling (Kim, 2014; Robin, 2016) as well as its gamification dynamics (rewards, feedback, time, scores etc.), in order to highly motivate and encourage 5-year-old children to synthesize knowledge from several sources (Kapp, 2012). Special emphasis was placed on the utilization of digital technologies as a means to offer extended opportunities for the promotion of cooperative learning, to strengthen interaction and to develop vocabulary skills (see also Bakhsh, 2016). The findings revealed that digital narratives and multimodal activities a) provided children with opportunities to interact in a gamified learning environment, and b) contributed to developing their listening comprehension skills. Furthermore, interplaying on multimodal interfaces with digital material designed for educational purposes proved to enable children to better acquire FL vocabulary.

Key words: digital storytelling, educational technology, gamification, foreign language, preschoolers

1. Introduction

The ways young learners communicate and express themselves are becoming more and more digital. On the one hand, a worldwide increase has been observed during the last decade in the use of Information and Computer Technologies (ICT) by young children, mainly regarding the home environment (Stephen & Edwards, 2018). Therefore, many children today start school being technologically literate. On the other hand, recent research work reveals that employing ICT as dynamic teaching tools in the language classroom seems to be imperative, as their integration and innovative teaching processes can contribute to meeting the challenges and opportunities of the mobile age (Kokkalia, Economou, Roussos & Choli, 2017; Merzifonluoglu & Gonulal, 2018), as far as

very young learners are concerned (see Korosidou & Bratitsis, 2019; Nikolopoulou, 2019). In that context, the concept of 'gamification of learning' emerges, which incorporates the use of game elements and game design techniques in non-game environments (Gibson, Ostashewski, Flintoff, Grant & Knight, 2015). Through the introduction of play practices, the learning environment becomes more effective, while the learning experience is more motivating for the learner-user. Consequently, on a short-term level gamification intends to enhance student engagement in the learning process (Seaborn & Fels, 2015), while in the long run, it may be possible to instill behaviours that can foster knowledge acquisition and social interactions (Furdu, Tomozei & Köse, 2017). Considering the abovementioned, we aimed at designing and implementing an innovative foreign (English) language learning environment with kindergarten children, where interaction with ICT for educational purposes would be of utmost importance.

2. Literature review on digital technologies and young learners

Recently, researchers and practitioners have placed great effort into combining FL pedagogy with digital technologies, since young or even very young children tend to use emerging technologies increasingly. The positive effects of educational practices utilizing mobile and game-based learning on student motivation have affected the learning process and have subsequently raised students' interest in the subject matter (Seaborn & Fels, 2015). When learners work in digital environments they a) are provided with authentic learning opportunities, b) are given chances to develop language and digital skills as they make connections between text, images, video, audio and animation, and c) are engaged in meaning making processes, also making connections between their new and prior knowledge (Boyaci & Atalay, 2015; O' Hara, Pritchard, Huang & Pella, 2012).

Even for preschoolers, high-quality learning environments can provide a framework where their natural tendency to explore is developed along with the construction of knowledge and the possibility to raise questions (Chesloff, 2013; Cutter, 2015). To exemplify, interactive e-books help kindergarten children develop their EFL skills (Hans, 2018), with gains reported in listening and phonological awareness (Hamadtoh & Gohar, 2017). Online activities, such as online games, were also found to aid children's vocabulary learning through play and interaction, when employed in a manner appropriate to their needs and potentials (AlNatour & Hijazi, 2018). Moreover, children acquire vocabulary in the target language and become familiar with its use through digital applications and digital games used in education or through Digital Storytelling (DS) (Alexiou & Vitoulis 2014; Alsied & Pathan, 2013; Daniel & Cowan, 2012; O 'Hara, et al., 2012; Paluka & Collins, 2015; Shelby-Caffey, Úbéda & Jenkins, 2014).

In more detail, DS is an educational method which uses technological devices in order to help the user develop interesting stories (Robin, 2016). In DS the art of telling stories is combined with a variety of digital multimedia (Lathem, 2005; Robin & McNeil, 2012), in order to induce learning by implicitly highlighting the language elements aimed to be learnt. It actually represents an evolution of traditional storytelling, enhancing the relationships between user, narration and context through the introduction of new narrative models (Miller, 2004). As learners become more involved in DS processes, they concentrate on appropriate language use in context. Therefore, they do not focus on memorizing vocabulary but rather on using language for a purpose. Multiple intelligences are recognized and exploited through the possibilities provided for the use of images, sounds and text to tell each story. Through these processes, DS appears to reduce students' anxiety levels while enhancing their motivation to actively participate in learning.

Abidin, Pour-Mohammadi, Souriyavongsa, Da and Ong (2011) observed that digital stories enhance the comprehension skills of preschoolers in a FL. Figg, McCartney and Gonsoulin (2009) conclude that by integrating DS in students' learning experiences, they are engaged in acquiring 21st century

skills, while teachers are provided with opportunities for differentiated instruction (Figg et al., 2009). Brenner (2013) noted the benefits of introducing DS processes to enhance children's intercultural awareness when learning a FL. She argued that digital stories are the ideal educational tool for learners to overcome the 'cultural shock' of learning the target language. Green (2013) and Skinner and Hagood (2008) reported similar findings.

Drawing on the above mentioned, language education more and more uses the power of multimodal tools to implement new teaching approaches for the benefit of learners. Thus, through DS educators seek to trigger young learners' creative thinking and allow them to develop the skills of a 'competent' technology user and a critical thinker. Overall, digital media constitute potent tools in education. However, focus should be placed on selecting applications or games suitable for the age of the children and tailored to their specific educational needs (see also Griva & Sivropoulou, 2009; Griva & Semoglou, 2012; Griva, Semoglou & Geladari, 2010). In other words, it should be assured that the digital material is linked to the learning objectives and clearly serves the acquisition of relevant knowledge and skills (Chalkiadaki, 2018; Korosidou, Bratitsis & Griva, 2021), as well as the interaction among peers (De Freitas, 2018).

3. The research study

3.1. Aim and research questions

This study is part of a broader research project that lasted two school years. An early language learning program was launched in a state kindergarten and the 1st grade of a state primary school. In this paper, focus is placed on the first year of the study, which lasted one school year. DS and gamification of learning techniques were employed with preschoolers in order to enable the development of their language skills in the target language (English). By listening to 'authentic', yet simplified written texts through a DS process, an 'experience' was created for the very young learners-users (Werbach & Hunter, 2012). Therefore, the following research questions were posed:

1. Can DS and educational technology have an impact on preschoolers' receptive language skills and their vocabulary development?
2. What are the opportunities for interaction created in a multimodal, gamified environment? What are the difficulties encountered in such a learning context?

3.2. Participants

The educational program was designed for very young learners and implemented to 26 preschoolers, 16 boys and 10 girls who attended a state kindergarten in an urban area in northern Greece. Their average age was 5.5 years old. All students were Greek and they had received no previous formal instruction in the target language, as EFL teaching in the Greek state school begins from the 1st grade onwards.

3.3. Methodology and research procedure

3.3.1. Syllabus design

Gamification of leaning techniques was integrated into a DS context, emphasizing 'authentic' language use and making the development of young learners' multiliteracies skills possible. At the same time, the cultural elements integrated in the stories helped the children correlate 'our culture' with a 'foreign' one, interrelating concepts of 'us' and 'the other'. The ultimate goal was to raise children's awareness of issues on multiculturalism and enable them to respect different 'identities'

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around the world. Links between language, culture and ICTs were sought. Attempts were made to foster learning experiences that would 'connect' the children's world with the environment around them (Brewster, Ellis & Girard, 2004), spark their interest and trigger their motivation; thus, creating the conditions for successful language learning.

The principles of the national Curriculum for the Kindergarten (2014) and the objectives included in the Kindergarten Teacher's Guide (2014), in accordance with the purpose and the specific objectives of the Curriculum for Early English Language Learning (PEAP, 2010) were initially taken into consideration by the authors. Furthermore, a coherent syllabus was designed by integrating the PEAP principles (http://rcel.enl.uoa.gr/peap/articles/genikes-didaktikes-odigies) with the purpose and the specific objectives of the present program. The choice of stories from all around the world was of primary importance for the creation of a teaching framework appropriate to the needs of the children. Stories seem to be the tool that can connect children's imagination with the real world around them, facilitating their acquisition of language skills. It seems that young children's concentration span becomes less limited and linguistic development is better achieved through stories (Vieira & Krcmar, 2011).

The syllabus was designed around 7 broad thematic units, with a digital story at the core of each unit. The educational material used was interactive and appropriate for children's perceived needs (Lynch, 2015). All stories were authentic, while in the process of creating digital stories, the necessary adjustments were made to achieve the appropriate language level for the children. The researchers created the stories by using relevant DS tools, such as *Storybird* (https://storybird.com), *Storyjumper* (https://www.storyjumper.com) or *StoryboardThat* (https://www.storyboardthat.com). Stories were selected based on (i) children's interests, as recorded through interviews with the children before the implementation of the educational program, (ii) children's learning needs, as reported in questionnaires distributed to their parents before the implementation of the educational program, and (iii) the authentic cultural elements and educational values contained in the stories, as documented by the researchers during the material design process.

3.3.2. Implementation of the program

The program lasted for a school year with 52 teaching hours allocated for 27 weeks. The educational activities were carried out for two teaching hours per week (1 teaching hour/ 2 times a week). In the following table (Table 1), the thematic areas of this part of the program and the corresponding story-based units are presented:

Thematic unit	Story
Colors	Our colorful world
Numbers	Let's travel around the world through stories
Family	Small hands can help big
Animals	The beautiful differences around us
Food	A friend from Japan
The weather	Our Australian friends
Face and body parts – Clothes	The real image

Table 1. The program's thematic units and the corresponding stories

The units were relevant to children's daily experience and constituted a framework for vocabulary acquisition in the target language, as well as for oral production of short phrases. More specifically,

researchers integrated communication practices in EFL in the context of the digital stories. As one of the researchers was also the teacher of the classroom, she ensured that preschoolers were encouraged to develop motives for learning the target language by participating in the learning process in small groups, interacting with the digital material and 'realizing' social rules and roles.

The implementation of the educational program was carried out in three stages: the pre-stage, the main stage and the post-stage.

During the pre-stage preschoolers were engaged in the interactive, DS process. Before narrating the story, the teacher encouraged preschoolers to follow her in a digital trip to the country of its origin. The children were provided with opportunities to activate their previous schemata by interacting with digital maps and playing memory games with interactive flashcards depicting culture, tradition or food themes. They could also listen to the vocabulary in the target language through recorded messages in order to gradually be able to make connections between the concepts and the words through audio and visual stimuli. DS was used as a teaching tool for presenting the story in an attractive way (Robin, 2016), facilitating interaction between peers and the multimodal material and aiming at a better understanding of the content (Korosidou, Bratitsis & Griva, 2021). Using related vocabulary such as 'Look at the cover!', 'Let's flip through this (digital) book', 'Click the arrow to move to the next page' and by finger pointing through the text during storytelling, the teacher aimed at developing very young learners' oral skills. In addition, children were encouraged to participate in the learning process by making predictions, observing the images, the shapes and the colors that accompanied the text, in order to draw conclusions and develop multiliteracies skills.

The researcher engaged them in performing basic verbal acts (e.g., greetings, thanks, self-presentations, etc.), as the heroes of the stories did, making simple presentations or descriptions with emphasis on certain details (e.g., use of adjectives to describe people or objects, use of nouns to express emotions). Audiovisual material, animation, songs and links embedded in the stories allowed for memorization and repetition of target language vocabulary in an enjoyable way. Moreover, children familiarized with linguistic (verbal utterances), non-linguistic (gestures, body posture, facial expressions) and paralinguistic (pitch, rate) features in oral communication, which alerted them on how to interpret the messages during the meaning making process.

In the main stage, they worked in groups in a multimodal environment, they played educational games by using digital media and cooperated with peers in order to win other teams and collect as many points as possible in a given time or find the solution to a given "problem". Some of the activities included digital memory games, digital puzzles, audio-visual recognition matching games, digital inductive reasoning and image sequencing games, as well as painting games by using online applications (e.g., http://www.crickweb.co.uk/Early-Years.html, https://www.dltk-kids.com/puzzles/jigsaw/ver20/canvas.asp?20160501, https://www.phonicsbloom.com/uk/game/match-cards?phase=2).

Finally, during the post-stage, kindergarten children experimented with educational robotics, by feeding the floor robot with the correct answers found on the mats designed by the researchers. Moreover, they engaged in QR code learning activities, where they used pictures on which researchers embedded QR codes in order to motivate them in story-retelling processes. During the activities, special emphasis was placed on encouraging children to reflect on their thinking process, while also providing feedback and recycling vocabulary in the target language.

3.4. Research tools

Both qualitative and quantitative data were gathered to assess the effect of the intervention on learners' language skills and their vocabulary development. Employing a data triangulation approach (Kember, 2003), the following research tools were used in the present study:

a) mid-term evaluation and post-test on vocabulary

All participants were assessed on their vocabulary comprehension at the mid of the school year, as well as after its completion, i.e., at the end of the intervention (post-test). The assessment was conducted using a test based on the Peabody Picture Vocabulary Test - 4 (PPVT - 4) (see Dunn & Dunn, 2007). A 10-page picture booklet (see sample in Appendix I) was designed by the researchers to assess preschoolers' comprehension of oral speech in the target language. The questions were of graded difficulty and concerned nouns in singular or plural form or small noun-phrases in topics related to vocabulary used in early childhood (e.g., animals, family, colors, numbers, clothes, fruits, and vegetables).

Each child was asked to identify and indicate the word they listened to. The teacher/ researcher also used expressions such as: 'Show me ..', 'Can you point at...', while she was also recording the children's answers on an assessment form. Each question in this part had one correct answer. An alternative version of the mid-term evaluation booklet was designed and used for the needs of the final evaluation.

b) a teacher/ researcher's journal

Journals have been proven to be valuable tools for recording, reflecting on aspects and episodes of teaching and improving the teaching/learning process (see Griva & Kofou, 2019). For the purposes of this study, the researcher recorded her observations in the journal once a week, in order to reflect on the implementation of the educational program and critically monitor the approach adopted. The reflective journal was developed based on the reflective questions proposed by Richards and Lockhart (1994, p. 44). In general terms, it aimed to interpret the strategies employed rather than simply record them in order to allow for ongoing evaluation and decision-making.

The qualitative analysis of 27 journals resulted into the following five typologies: i) Teaching approach, ii) Communication and interaction, iii) The role of the teacher, iv) Children's attitudes, and v) Evaluation of the learning process. Several categories and subcategories were organized and grouped into each typology (see Appendix II).

c) semi-structured interviews with the children

Semi-structured, face-to-face interviews were conducted at the end of the school year with all the children involved in the program in order to investigate their attitude towards the program, the DS process and the target language. Children were asked to speak freely and reflect on their participation in the program. By describing their experiences, they were encouraged to offer ample research material to let researchers interpret their attitude towards the educational program. *'Did you like the stories/ games? Why?', 'Which was your favorite story/ game? Why?'* or *'What did you learn in your English class?'* were some of the questions posed.

4. Results

4.1. Mid-term and post-test on vocabulary

As the results of the conducted independent samples test show (Table 2, Table 3), the difference detected between mid-term and post-test evaluation means, *although not statistically significant,* tends to the acceptance limit (p=0.052); therefore, setting implications to effective vocabulary acquisition in the specific educational environment.

	N	Mean	Std. Deviation	Std. Error Mean
Mid-term	26	0,77	0,15	0,03
Post	26	0,85	0,12	0,02

Table 2. Mid-term and a post-test evaluation means

	Sig.(2-tailed)
Equal Variances assumed	0,052647
Equal Variances not assumed	0,052895

Table 3. Mid-term and a post-test evaluation (Levene's Test for Equality of Variances)

4.2. Teacher/ researcher's journal

According to the journal data, DS and educational tools employed in the current study had an important impact on preschoolers' language skills. The researcher noted that: *'they were interested in digital storytelling, reacting verbally and non-verbally',* and *'they were very enthusiastic about the digital storytelling process and interacted with the digital material'*. DS attracted the interest of children, who *'got excited every time a new story was introduced in this multimodal learning framework'.* Employing multimodal material and having learners participate in activities relevant to each story's content, led to their active participation during the learning process and promoted the enhancement of their receptive skills, as the teacher/ researcher stated that: *'they are always eager to play language games on the interactive whiteboard, having opportunities to recycle the target vocabulary'* or *'they play and learn in groups, helping each other and using the L2 meaningfully'.*

The journal data also revealed that a host of opportunities for interaction were provided to children in the specific educational environment created. Their listening comprehension skills were developed, as the researcher recorded that *'the children understood the instructions given orally'* and that *'the children understood the simple phases uttered in oral language'.* The importance of using non-linguistic and paralinguistic elements was also of utmost importance, as *'with the help of gestures and body language the children comprehended the messages in the target language'*. The

children also seemed to gain knowledge relevant to topics of 'culture', 'tradition' or 'foreign language' and developed their respect towards the 'other', as they *'liked the traditional costumes of the heroes', 'paid attention to the flags of the countries, the shapes and the colors'* or *'were encouraged to focus on the country of origin of each story, the traditional elements contained in it and people's habits in that part of the world'.*

In addition, the teacher/ researcher recorded some of the difficulties that preschoolers encountered in their attempt to understand oral language, either in a video, a song or during storytelling or when produced by the teacher herself. According to the journal entries *"they had some difficulty in comprehension during the narration of the story, but were willing to overcome it by making assumptions and trying to understand the meanings through the help of pictures, sounds or other supplementary material"* or *"sometimes children find it difficult to understand… the translanguaging mechanism is employed to let them successfully complete tasks without losing their interest."*

4.3. Interviews with the participants

The qualitative analysis of the interview transcripts revealed that children enjoyed learning English by being involved in DS. Children stated that *'I really liked English ...', 'Yes, I liked English and what we did here was nice'.*

The stories seemed to capture the interest of preschoolers. They reported: "*I liked the stories you told us and then I told them to my mum. I loved the Ugly Duckling,"* and *"I liked the story with the kangaroo and the baby, because I liked the pictures and the song we listened to and we were jumping up and down,"* or *"I liked the story you told us because we pressed the buttons and the pages turned in the book*."

Multimodal material was also observed to be an important factor in the language learning process, as it attracted children's interest and encouraged them to participate actively. More specifically, they stated the following: *"I liked the videos we watched and when we read the fairytale on the (interactive) whiteboard"* or *"all the videos we watched were fun... I asked my mum to watch them again at home."* Concerning the difficulties encountered, children mentioned that *"sometimes I don't understand because everything is in English…but my classmates help me,"* "*sometimes it's difficult for me to remember the words to play the games, but my group may know the answer and help me win"* or "*I like playing on the interactive whiteboard and I like the tablet… it's fun…but I don't like it when some children want to play all the time and they won't let us play."*

5. Discussion

The present study aimed at exploring the impact of DS and educational technology on the acquisition of preschoolers' foreign language skills through interaction in a multimodal, gamified environment. The analysis of the research data showed that preschoolers had various opportunities to expand their vocabulary knowledge in the target language and develop their receptive skills regarding oral language comprehension. Although some difficulties were recorded in listening comprehension or oral production of target language vocabulary, the findings of the present study indicated that the quality and frequency of the language input can significantly contribute to the enhancement of young children's language ability (see also Pfenniger & Singleton, 2017).

In relation to the impact the educational technology had on preschoolers' receptive language skills and their vocabulary development, it was revealed that the adaptation and the simple phrases in the digital narratives motivated children to watch the stories, while the existence of a specific and

repetitive structure in every story enabled children to understand the meanings in the target language. DS in the kindergarten context created appropriate and effective conditions for EFL learning, as stated in the relevant research (Kim, 2014), while the use ICT increased children's exposure to the target language (see also Sakamoto, 2015) and their motivation (see Bursztyn, Pederson, Shelton, Walker & Campbell, 2015); thus, having a positive impact on children's receptive skills and vocabulary development. Furthermore, several gains stemmed from children's contact with cultural elements embedded in the digital narratives (references to language, customs and traditions, songs, food, etc.), allowing for children's multicultural awareness raising.

Concerning the opportunities for interaction created in a gamified learning environment enhanced participation and created stimuli for cooperation in groups. The quantitative and qualitative data analysis showed that collaboration and the use of digital media allowed preschoolers to develop their receptive skills regarding oral language, by exercising their multiliteracy skills. Their metacognitive skills were also enhanced as young students were often encouraged to explain their thinking process to their classmates in order to facilitate problem solving, (e.g., when flipping through a digital book or when clicking on interactive flashcards or audio messages to get some feedback on a story's content). Moreover, the ICT-based activities maintained very young children's focused attention on the learning process for a longer period of time. Their enthusiasm, interest and eagerness to participate in gamified activities made it easier for children to acquire FL vocabulary in an effective and natural way. The positive effects of using educational digital tools in creating an effective learning environment for young children highlight the importance of integrating ICTs in early language learning environments. Similar research findings were reported in previous studies having revealed that stimuli provided in a multimodal environment leads to the creation of a dynamic language learning environment (Cutter, 2015; Hassan, Rosnani, Ahmad & Su, 2016). In other words, children's exposure to multiple modalities such as texts, images, videos or animation creates an educational framework that could significantly influence vocabulary learning.

Stakeholders should take into consideration that technological devices and applications along with the interrelationship and interaction with multimodal semiotic resources may affect the classroom environment and have a positive impact on learning (see Jewitt, 2006). Future research is suggested to investigate i) the impact of multimodal material on children's productive skills and ii) the long-term effect of early language leaning with the ICTs use on students' language skills. In addition, the feasibility of the project in other contexts should be carefully considered, as the current study sample was rather small.

6. Conclusion

The innovative framework, integrating DS and gamification techniques, proved to have a positive impact on the effectiveness of the learning process in early childhood education settings. DS introduces young children to meaning making through visual and audio material utilized to support the story's events. Moreover, the quality and frequency of the language employed leads to improved language ability (e.g., vocabulary gains, enhanced communication skills). Furthermore, the narrative process facilitated the development of listening skills and digital skills. The engaging and motivating content allows for young children's active participation, while play-based digital learning activities keep children's interest and attention high, enabling them to develop positive attitudes towards FL learning.

The findings of the current study should be of interest to FL curriculum developers and material designers. The use of technology and multimedia in early FL learning settings should also be identified by educators, who can consider the above-mentioned recommendations in order to

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acknowledge the benefits and overcome the barriers toward the implementation and sustainability of early FL learning programs.

Considering the limitations of the study, although the findings indicate that DS and gamification of learning may be potent tools that can be employed for early FL learning, the existence of a control group could further confirm the effectiveness of the pilot implementation. Further studies could also detect any convergences and divergences between the traditional and digital storytelling on early FL learning outcomes and profoundly evaluate the impact of DS on children's learning in preschool and early primary school contexts.

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Appendix I

Mid-term evaluation sample
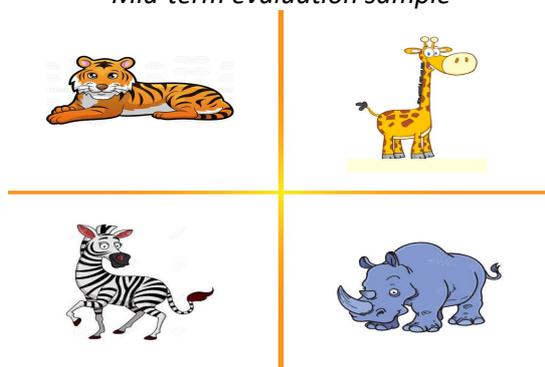
Appendix II

Indicative typologies and categories of the teacher/ researcher's journal

Typology	Categories
A. Teaching approach	Developing multiliteracies skills
	Developing cross cultural skills
	Developing language skills
	Multimodal learning environment
	Collaborative learning
	Engaging in problem solving
B. Communication and Interaction	Taking initiatives
	L2 use and paralinguistic features
	L2 use
	L1 use
	Translanguaging
	Multiliteracies meaning making

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