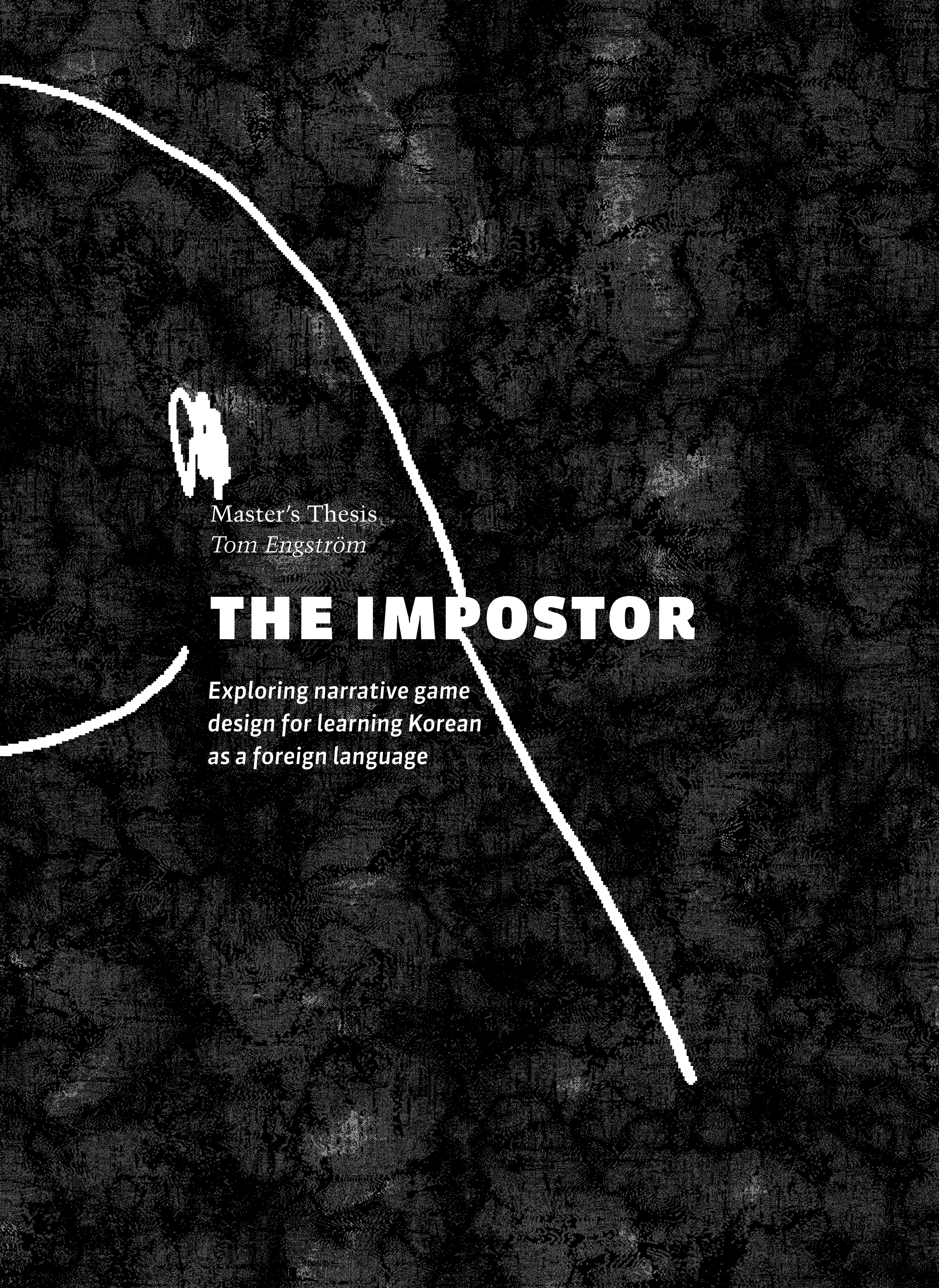

Master's Thesis
Tom Engström

THE IMPOSTOR

Exploring narrative game design for learning Korean as a foreign language

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Viime vuosina digitaalisten kielten oppimista varten luotujen pelien ja applikaatioiden määrä on lisääntynyt voimakkaasti. Valtaosa olemassa olevista applikaatioista soveltaa kuitenkin käytäntöjä ja teoreettisia lähestymistapoja, jotka eivät opeta käytännön kielitaitoja. Lisäksi kaupalliset applikaatiot keskittyvät lähinnä kieliin, joilla on suuret markkinat ja eivätkä tue pienempiä kieliä kuten Koreaa.

Tämän opinnäytetyön päämääränä on tutkia kielten oppimisen ja vieraan kielen omaksumisen teoriaa sekä niiden käytännön sovelluksia ja löytää opetusmenetelmiä, jotka soveltuvat parhaiten käytännöllisen Korean kielen taidon opiskeluun. Työn tuloksena löytyi kulttuurihistorialliseen psykologiaan ja ekologiseen kielten omaksumisteoriaan pohjautuvia menetelmiä, jotka integroitiin osaksi opinnäytetyön osana suunniteltua oppimispelikonseptia.

Tämä opinnäytetyö havainnollistaa, että pohjimmiltaan sekavan digitaalisten kieltenopiskelupelien suunnitteluprosessin pohjaaminen kieltenoppimisteoriaan on paitsi mahdollista myös hyvä lähtökohta suunnittelutyölle. Työn päälöydökset osoittavat lisäksi, että suunnittelijoiden tulee tunnistaa tavoitellut oppimistavoitteet, oppimiskokemukset ja pelikokemukset ajoissa, jotta suunnittelutyö etenisi tehokkaammin. Lisäksi opinnäytetyö korostaa, että digitaalisten kieltenopiskelupelien suunnittelijoiden tulee perehtyä syvällisesti sekä opiskelun kohteena olevaan kieleen että pelisuunnitteluun.

Avainsanat digitaalinen kielten oppiminen, pelien suunnittelu, sovellettu kielitiede, peleihin pohjautuva kielten opiskelu

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Abstract

In recent years, digital language learning games and applications have proliferated. However, most existing apps employ methods and theoretical approaches that are not designed to teach learners practical language competence. Additionally, commercial apps tend to focus on languages with large markets, leaving smaller languages like Korean unsupported.

The objective of this thesis was to explore language learning and second language acquisition (SLA) theories and their practical applications to find teaching methods that are best suited for improving practical language competence of Korean. Having identified such methods grounded in socio-cultural and ecological SLA theory, the thesis further integrates the teaching methods into a conceptual design of a digital language learning game for learning Korean as a foreign language.

This thesis demonstrates that a grounding the fundamentally messy digital language learning game design process in SLA theory is not only viable but a good starting point. Key findings indicate that the designers need to identify the targeted learning objectives, learning experiences and game experiences as clear design goals early on, to efficiently guide the inherently messy design process. Furthermore, the thesis highlights that digital language learning game designers need to develop and nurture knowledge both in the target language instructional domain and in game design.

Keywords DGBLL, digital game-based language learning, game design, applied linguistics, game-based L2TL

Master's Thesis
Tom Engström

THE IMPOSTOR

Exploring narrative game design for learning Korean as a foreign language

Thesis submitted in partial fulfilment of the Requirement for the degree of Master of Arts in New Media Design & Production in New Media.

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ERRATA

p. 16: Huizinga's ~~(1949)~~ (1949/1980)

p. 21, second paragraph: "... inherent complexity ~~in~~ of designing language learning games ~~reflects~~ is reflected in ..."

pp. 22, 30, 32: Rouse, ~~2001~~ 2004

pp 25, 35: Schell, ~~2018~~ 2008

p. 26, comma missing: ~~Burgos Martínez-Ortiz~~ Burgos, Martínez-Ortiz

p. 29, Fig. 2 caption: Schell, ~~2010~~ 2008

p. 33: Reinhardt's ~~(2008)~~ (2008)

p. 44, Section 4.4.2, second paragraph: emphasis missing~~;~~ "(e.g. for ~~sleep~~ *sleep*, they must click on the bed)"

p. 62: ~~Hod, A. (2007)~~ Amory, A. (2007).

p. 67: ~~Reinhardt & Sywkes, 2013~~ Sykes & Reinhardt, 2013

p. 67: ~~Sykes & Reinhardt, pp. 25~~ Sykes & Reinhardt, 2013, pp. 25

p. 66: Reinhardt, J. (2018) mistakenly listed another time

TABLE OF CONTENTS

1 INTRODUCTION 9

2 LEARNING LANGUAGES AND PLAYING GAMES 12

2.1 Second language learning and acquisition theories 12
2.1.1 Perspectives on language learning 12
2.1.2 Perspectives on second language acquisition 12
2.1.3 Interlanguage pragmatics and Korean 15
2.2 Play and game 16
2.2.1 Play 16
2.2.2 Game 16

3 DIGITAL GAME-BASED LANGUAGE LEARNING 19

3.1 Game-informed, game-enhanced and game-based L2TL 19
3.2 Playing to learn and learning to play 21
3.3 Affordances 22
3.3.1 Contextualized language learning 23
3.3.2 Goal-oriented learning and feedback 25
3.3.3 Sheltered practice and time for L2 Use and learning 26
3.4 Approaches to narrative-based learning game design 29
3.4.1 Analysis and ideation 30
3.4.2 Synthesis 32
3.4.3 Validation 35

4 METHOD 37

4.1 Ideation 37
4.2 Benchmarking vernacular game mechanics 38
4.2.1 Narratives and progressive designs 38
4.2.2 Tasks and quests 40
4.2.3 Multimodal representations 40
4.2.4 Takeaways 41
4.3 Benchmarking language learning games and applications 42
4.3.1 Contextualized language use 42
4.3.2 Goal oriented learning and feedback 44
4.3.3 Takeaways 46
4.4 Design goals 46
4.5 Proposed architecture 47
4.5.1 Architecture and underlying technology 47
4.5.2 Fictional world and narrative 48
4.5.3 Mechanics and gameplay 49
4.5.4 Aesthetics 49

5 RESULT: THE IMPOSTOR 51

5.1 Interface mockups 51
5.2 Technology 58

6 DISCUSSION AND REFLECTION 59

7 CONCLUDING REMARKS 61

8 REFERENCES 62

Appendix i - Terms 67
Appendix ii - list of games and applications mentioned 68

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Tom Engström
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1

INTRODUCTION

In recent years, digital games have proliferated and become increasingly mainstream culture. This rising popularity of digital learning games can be attributed to a generational shift in learners, who are increasingly comfortable with and expect to be able to use new media forms like digital games in all aspects of their lives, including learning (Acquah & Katz, 2019; Prensky, 2007). To address digital games' increasing popularity, research into these games has likewise expanded in many fields of study. This expansion has led to the emergence of a nascent field of digital game-based learning studies, including a field dedicated to digital game-based language learning (DGBLL).

Reported benefits of DGBLL strategies in formal learning contexts include improved learner motivation and learning outcomes (e.g. Hung, Yang, Hwang, Chu, & Wang, 2018; Peterson, 2013; Xu, Chen, Eutsler, Geng & Kogut, 2019). For informal learning contexts beyond the classroom, mobile games have afforded more casual language learning activities (Lai & Zheng, 2018). However, any benefits are by no means guaranteed, and there are numerous challenges in applying DGBLL strategies successfully in both formal and informal contexts (Peterson, 2013; Sykes & Reinhardt, 2013). Consequently, many existing DGBLL applications have not been able to align game-related goals with language learning objectives effectively (Blume, 2019).

Some of these existing games and apps utilize sophisticated technologies such as machine learning algorithms, spaced repetition systems and voice-to-text parsing. However, in the majority of the applications, learning activities themselves are still primarily centred on decontextualized vocabulary acquisition and grammar drills. These methods result in inert beginner-level knowledge of language structures (Blume, Schmidt & Schmidt, 2017; Reinhardt, 2018), hinder learner agency (Sykes & Reinhardt, 2013), and are considered insufficient for developing practical competence in languages (Cook, 2013; Sykes & Reinhardt, 2013; Larsen-Freeman, 2001). Additionally, most commercial language learning games understandably aim for large markets such as English, Spanish or Chinese, which unfortunately leaves smaller languages such as Korean or Finnish relatively unsupported[1].

James Paul Gee (2005) suggests that well-designed games can provide an environment for learners to connect words with meaningful images, experiences, actions, goals and dialogue. Gee assumes that this kind of contextualization will foster a deeper understanding of the target language. One way games provide such contextualization is through narratives (Sykes & Reinhardt, 2013; Calleja 2007).

Narrative use in language learning games and gameful apps is still relatively rare (Blume, 2019). Even apps that use narratives (e.g., *Koe*, *Lingotopia*, *Duolingo Stories*) tend to be relatively linear with limited player agency to affect or explore different outcomes as well as limited learner agency to choose learning objectives. This study aims to provide an incremental step towards bridging this gap by developing an interface concept for a narrative-based language learning game for Korean as a foreign language. The intended audience of the thesis is media and game designers. Therefore, the thesis only briefly touches upon basic concepts regarding design and design processes but explains language learning and second language acquisition (SLA) theories on a fundamental level.

---

[1] Of the market leaders *Duolingo*, *Busuu* and *Babbel*, only *Duolingo* supports Korean, and even there the full features are not available.

Given the breadth of the problem space, this thesis presents merely an incremental step towards better DGBLL. The design objective is to create a feasible interface concept and an architectural game model that are both informed by contemporary DGBLL research and implementable with existing or emerging technologies.

The guiding research questions I am exploring in the thesis are:

- What kind of narrative-based game design can improve learner agency and contextualization of language in digital game-based language learning of Korean as a foreign language?
- How could this type of game help learning the practical use of Korean?

The personal motivation for this thesis developed during my two exchange semesters in Seoul between 2015-2016. To learn the basics of Korean language before the exchange year, I attended an intensive two-week Korean course and started using various language learning games and apps like *Duolingo*, *Eggbun* and *Memrise* to learn independently regularly. I continued using these apps during and after the exchange period. I found my progress frustratingly slow as the apps' learning content didn't encourage proactive language use, skill progression was entirely linear and strict, the challenge levels plateaued, and my language retention stagnated.

At the same time, I was playing other mobile and PC games with stimulating challenge levels and plenty of agency to make choices. I also found some games like *Korean Dungeon* and *Catch It! Korean* that link language content to gameplay, but this connection is very superficial and the gameplay quickly repeats itself. Certainly, I thought, there is a way to integrate language learning with games without excessively compromising on gameplay quality.

Inspired in part by my frustratingly slow progress and in part by a growing interest in app and game design and development, I started looking into the mechanics of language learning apps and language pedagogy. I was somewhat taken aback by the work already done and the size of the problem space but determined to contribute a solution.

This thesis has seven chapters. This **first introductory chapter** introduces the issue of a lack of contextualization and agency in digital game-based language learning of L2 Korean and my motivation for the thesis.

The **second chapter** is a look into key terms, concepts and theories in the fields of second and foreign language teaching and learning (L2TL), SLA theory and game studies which are central to the thesis.

The **third chapter** is a literature review that investigates the role of contextualization and agency in DGBLL research and practices.

In the **fourth chapter**, I present the method I used to develop a prototypical Korean language learning game based on the theoretical and practical framework developed throughout the thesis.

The **fifth chapter** describes the results of this prototype. The **sixth chapter** discusses and reflects on the results of the prototype and the entire thesis. Finally, the **seventh chapter** concludes the thesis.

2

LEARNING LANGUAGES AND PLAYING GAMES

By definition, DGBLL deals with games and learning, specifically language learning. To frame the following discussion for designers who are not familiar with these fields, this chapter will define some key terms and concepts.

2.1 SECOND LANGUAGE LEARNING AND ACQUISITION THEORIES

As a subfield of language learning, DGBLL involves theories of learning and SLA. The theoretical learning perspectives are relevant to DGBLL because they drive the teaching and learning strategies (Filsecker & Bündgens-Kosten, 2012). DGBLL literature also extensively refers to theories to argue for specific methods and techniques. Therefore, while an extensive mapping of learning theory is beyond the scope of this thesis, at least a simplified account is prudent and necessary for later discussion.

2.1.1 Perspectives on language learning

There are three main learning theories: behaviourism, cognitivism, and constructivism (Ertmer & Newby, 2013; Filsecker & Bündgens-Kosten, 2012). According to behaviourism, a person's knowledge consists of a set of organised associations between external environmental stimuli and personal responses (Filsecker and Bündgens-Kosten, 2012). Therefore the goal of instruction is to map external objective truths about the world onto a reactive learner through repeated stimulus-response cycles (Ertmer & Newby, 2013; Filsecker & Bündgens-Kosten, 2012).

The cognitivist perspective also considers knowledge as objective and external. However, cognitivism asserts that learning is a proactive process inside the learner's mind (Ertmer & Newby, 2013; Filsecker & Bündgens-Kosten, 2012). Therefore, learning can also occur without explicit stimuli.

Constructivism also considers that knowledge resides in the learner's mind (Filsecker & Bündgens-Kosten, 2012; Ertmer & Newby, 2013). In contrast to behaviorism and cognitivism, however, constructivism asserts that humans do not acquire meaning from an external reality but create it instead (Ertmer & Newby, 2013). Therefore, knowledge is an "adaptive function" of how a learner constructs knowledge through their interpretations of the world based on individual experiences and interactions that occur in different situational contexts (Filsecker & Bündgens-Kosten, 2012, p. 54; Ertmer & Newby, 2013). As a result, the constructivist focus is in engendering personal experiences, social activity and reflection.

2.1.2 Perspectives on second language acquisition

As a learning subject, language competence consists of two parts: **linguistic competence** and **pragmatic competence** (Cook, 2013). Linguistic competence, also called grammatical competence, involves the knowledge and ability to connect individual grammatical forms with meaning and appropriate use in sentence structures (Larsen-Freeman, 2001). Pragmatic competence is the knowledge of and practical ability in language use in different contexts, including communicating with others and one's internal thinking processes (Cook, 2013). The field of second language acquisition (SLA) has formed many theories on how these two competencies are acquired when learning a second language. Reinhardt (2018) categorises these theories into three schools of thought: structural-behaviourist, psycho-cognitive, and social-informed.

The structural-behaviourist perspective considers language a composite of formal, separate systems of phonology, morphology, syntax, and semantics (Sykes & Reinhardt, 2013). This view tends to focus on decontextualised language forms, and as such, is considered partly obsolete and superseded by other approaches (Sykes & Reinhardt, 2013), especially in terms of developing pragmatic competence (Larsen-Freeman, 2001; Cook, 2013). However, despite its purported obsolescence, the structural-behaviourist perspective has long roots and maintains considerable influence on L2TL practices (Sykes & Reinhardt, 2013, Cook, 2013) and is often applied in contemporary digital language learning games (e.g. in Blume, Schmidt & Schmidt, 2017).

Structural-behaviourist teaching styles include the **academic** and the **audio-lingual** styles (Reinhardt, 2018; Cook, 2013). The primary goal of the academic style, often referred to as the grammar-translation (GT) method, is to utilise translation practice to improve linguistic competence. GT treats pragmatic competence as secondary. The goal of the audio-lingual style is to get students to "behave" correctly in common language situations by habit formation through repeated drills (Cook, 2013). However, critics note that this approach is unable to teach students how to produce wholly new sentences (Cook, 2013).

A task in an academic/audio-lingual style might have a learner study a list of vocabulary where the words would first play as audio and then display as text and the source language translation (Cook, 2013). Assessment would focus only on students' ability to match translated form-meaning pairs, not on their use in new sentences (Reinhardt, 2018). A popular DGBLL application of this approach is *Duolingo*.

A **psycho-cognitive perspective** follows the cognitivist view in considering language a construct of representations and relationships of form, meaning and usage in the learner's mind (Reinhardt, 2018). This view still emphasises the importance of grammatical structures (Cook, 2013) but encourages exploration and experimentation to engender further cognitive connections between concepts in various contexts (Reinhardt, 2018). The psycho-cognitive perspective advocates teaching and learning styles that engage the cognitive processes of the learner through experimentation, exploration and immersion in different strategies and contexts involving comprehensible target language input (Reinhardt, 2018).

Social-informed perspectives are varied, but they all share the same view that communication and sociality are crucial to developing pragmatic competence (Reinhardt, 2018). A well known and influential social-informed perspective is the constructivist, sociocultural approach (Reinhardt, 2018; Cook, 2013). The sociocultural approach has its roots in psychologist Lev Vygotsky's (1934/1986) notions of thought and language. One of Vygotsky's (1934/1986) more influential concepts is the zone of proximal development (ZPD), which is the space of activities that a learner can do with assistance. If a learner can complete an activity independently or are unable to do it even with assistance, that activity is outside of their ZPD. Vygotsky (1934/1986) posits that activities inside the ZPD are most conducive to learning because they are not too easy and not too complicated.

Communicative language teaching (CLT) is the main teaching style among the sociocultural approaches (Cook, 2013). As its name implies, the basis of CLT is on communication, both as the end-goal and as the primary teaching technique (Cook, 2013). It involves collaborative, educational dialogue between the learner and someone else during which knowledge is internalised (Cook, 2013). The goal of CLT is pragmatic competence, and varying styles of CLT emphasise either social activities, information transfer or tasks (Cook, 2013). The latter is also known as **task-based learning and teaching** (TBLT).

TBLT revolves around tasks that require learners to use language to attain a goal (Sykes & Reinhardt, 2013). Success is determined by whether or not the learner completes the goal (Cook, 2013). The specifics of the goal are not as important as the fact that the target language was used to reach it. Therefore, a task can vary from something like "instruct your friend to assemble a chair" or "write a shopping list". The critical constraint on TBLT tasks is that they must be authentic.

An authentic learning resource is something that the learner considers worthwhile and meaningful (Van Lier, 2000). In TBLT, tasks can be learning-driven, i.e. dictated by the instructor and SLA theory, or they can be learner-driven, i.e. borne from the learner's choices and what they consider useful and meaningful (Sykes & Reinhardt, 2013). Typically learners authenticate learner-driven tasks more readily. Van Lier (2000) argues that for authenticity, the learner's perception and experience of a given task or goal is most important and whether the task or goal is genuinely authentic in the sense that it could happen in the real world is secondary. Therefore, TBLT does not necessarily need to concern itself with real-world tasks, which is useful in DGBLL because most games involve fictional worlds and tasks.

Like the other teaching styles, TBLT has its advantages and disadvantages. It has been shown to improve fluency, accuracy and complexity of language output in the classroom context, but tends to lack the structure and rigorous approach required for developing grammatical, linguistic competence as well as clear pathways towards learning goals (Cook, 2013). Since many real-world tasks (e.g. finding out what the weather forecast is) are more comfortable to accomplish in a learner's native language, TBLT needs to provide sufficient motivation as to why learners ought to do such tasks in the target language (Cook, 2013).

A relatively recent addition to the gamut of SLA perspectives is the **ecological perspective** (Reinhardt, 2018). The ecological view expands the sociocultural view into including technologically mediated environments, or ecologies (Reinhardt, 2018). A key concept to the ecological perspective is **affordance**, a feature of environments and artefacts which afford specific actions and activities depending on how potential actors perceive them in a particular context (Gibson, 1979; Kramsch & Steffensen, 2008). For digital game-based language learning, the concept of affordances is useful to explain how different game mechanics and features afford various learning behaviours in different contexts (Reinhardt, 2018). Section 3.3 discusses affordances in more detail.

Most scholars agree that all of the approaches mentioned above are valid depending on the context (Ertmer & Newby, 2013; Filsecker & Bündgens-Kosten 2013; Cook, 2013). Therefore no learning model or SLA approach has yet emerged that is sufficient to account for all situations.

2.1.3 Interlanguage pragmatics and Korean

Cook (2013) argues that most SLA approaches treat second language knowledge subordinate to native language knowledge and consider the native speaker's level as the highest standard to aspire to. However, Cook asserts that L2 knowledge is fundamentally different from L1 knowledge and therefore, multilingual speakers think differently from monolingual native speakers. According to Cook (2013), this should be reflected in how SLA is approached and what the ultimate goal of L2TL practices are: "the goal of teaching is to enable a non-native speaker to use the language effectively, not to enable him or her to pass as native" (p. 224)

As a step in the direction outlined by Cook, interlanguage pragmatics has emerged as a subfield of pragmatics that focuses specifically on pragmatic competence in second and foreign language use and learning (Taguchi & Sykes, 2013). From an interlanguage perspective, pragmatic competence depends on two skills: **knowledge about** the correct form-meaning-use mapping in the target language, and the **ability to apply** this knowledge effectively in a real use situation in the target culture (Taguchi & Sykes, 2013). The difficulty of developing these skills depends on the differences between the source and target languages, and on the perceived and real differences of societal and cultural aspects associated with each language. This is especially the case between Korean and English.

There are several challenges involved in learning Korean for English-speaking Western learners. First of all, the alphabet is different: Korean uses Hangul, whereas English uses the Latin alphabet. Secondly, the English word order subject-verb-object (SVO) is different from the subject-object-verb (SOV) order used in Korean. Furthermore, Korean is a high-context language that allows the dropping of pronoun sentence subjects when they can are inferable from the situational context. This pro-drop is not possible in English, which is a low-context language. Finally, Korean has multiple levels of honorifics applicable to various situations and requires language users to have a high awareness of both situational and cultural contexts.

Potential mismatches between what the learner considers "polite" or "rude" and what the general understanding of them is in the target language culture further exacerbate acquisition of interlanguage pragmatics in Korean (and any other language) (Brown, 2011). Furthermore, in a face-to-face context, non-verbal communication cues such as hand gestures or facial expressions (which also carry societal and cultural meanings) contribute to the meaning of any utterance (Taguchi, 2013). This makes it difficult to develop both pragmatic competence skills outside of a genuine socio-cultural context (Brown, 2011), as creating an interactive facsimile would have to account for a myriad of variables. However, knowledge about correct language use in varying societal and cultural contexts can still be developed relatively independently from a genuine context. This is an area where relatively simple digital games can be leveraged to facilitate learning.

2.2 PLAY AND GAME

2.2.1 *Play*

Caillois (1961/2001) expands on Huizinga's (1949) definition of play and defines it as a voluntary activity that is bounded by predetermined limits of space and time, has uncertain progress and outcomes, is unproductive, rule-based and make-believe, or different from everyday life. Caillois further describes six elements of play, namely *ludus*, rule-bound play; *paidia*, open-ended, free play; *mimesis*, mimicry or imitation; *ilinx*, vertigo or movement; *agon*, competition; and *alea*, chance (p. 12-13). These elements are present in varying amounts in a given situation involving play.

Play is directly related to language learning through the concept of language play. Language play is playing with the formal qualities of and conventional meanings in language (Sykes & Reinhardt, 2013), which is common in e.g. rap music. For some learners and learning styles, **language play**[2] can help develop language awareness, or "explicit knowledge about language, and conscious perception and sensitivity in language learning, language teaching and language use". An example of a language play game is the Korean word chain game (끝말잇기), where you come up with a sequence of words where the next word always starts with the last syllable of the previous word.

2.2.2 *Game*

A game can is a form of play that is bound by an additional system of rules, goals, values, and outcomes (Juul, 2005). A narratologist view sometimes contests this rule-based ludologist view by claiming that games are (also) narratives and a new form of storytelling (Calleja, 2007; Peterson, 2013). Juul concedes that the discussion on narratives is largely semantic (2005), but argues that most games do not have narratives or

[2] https://lexically.net/ala/la_defined.htm

stories, but fictions, that is, fictional settings and worlds that contextualize the rules of the game. Reinhardt uses the term narrative in a similar way to Juul's fiction. This thesis follows Reinhardt's terminology and remains agnostic on the ludologist-narratologist debate. In the vast majority of games, both rules and narratives exist (Reinhardt, 2018).

Games can also be seen as a new form of media, encompassing gaming, game-making and their attendant discourses, communities and social practices (Reinhardt, 2018). Accordingly, game literacy has emerged as a new form of literacy. Gee (2007) defines game literacy as the ability to play, learn through, and understand games, both in the context of a single game and games in general. Players with poor game literacy are likely to experience difficulties when gaming, a practical consideration in using games for learning, digital or otherwise.

Games as artefacts or products can range from simple sets of rules (e.g. tag) to analogue games (e.g. *Monopoly*) to **digital games** (e.g. *World of Warcraft*). In this thesis, any game that is playable with a digital device such as a computer, tablet, game console, or handheld device is considered a digital game. Typically, a genre is a combination of game mechanics and the game theme, i.e., the setting and imaginary context of a game (Reinhardt, 2018). Scholars and practitioners often categorize digital games into genres such as simulation games, role-playing games, puzzle games, adventure games, or text-based games (Peterson, 2013).

Schell (2008) divides game elements into four categories: mechanics, story, aesthetics, and technology (Fig. 1).

Game aesthetics are the parts of the game than can be sensed visually or otherwise, including graphic, sound and haptic interfaces, and in some cases the physical artefacts. They are directly interfacing with the player and as such are important in impacting how the player experiences the game. (Schell, 2008; Juul, 2005)

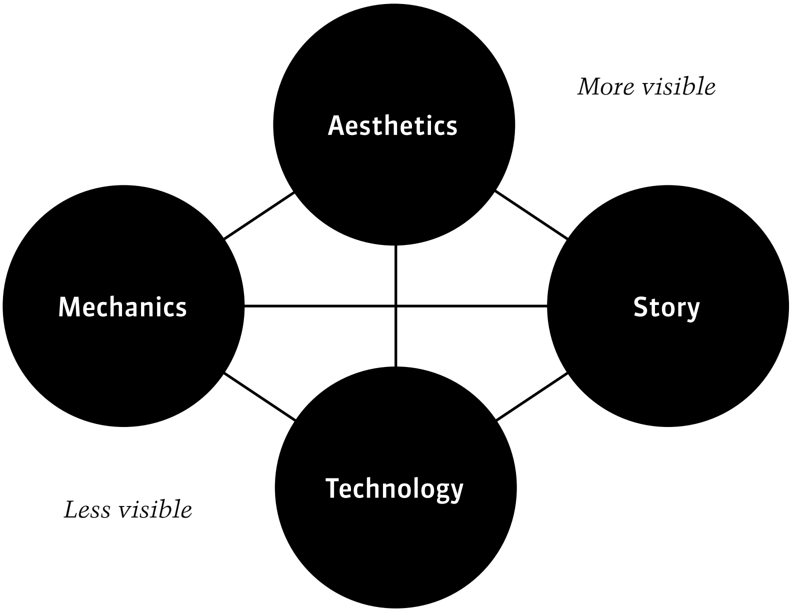
Game mechanics are the rules of the game; they describe what the game does and doesn't do and what the player can do and cannot do (Schell, 2008). Mechanics can include collecting, puzzle solving, racing, negotiating with other players, building, and so on (Reinhardt, 2018). Game features are types of smaller mechanics that structure gameplay but cannot be acted upon, such as levels, points, randomizers, quests and turns (Reinhardt, 2018).

Game story is the narrative that contextualizes the mechanics, aesthetics and other aspects of the game into a thematically coherent entity (Schell, 2008). The story is transmitted not only through the game aesthetics but also through discourse between players, which might include rumours (Juul, 2005).

Game technology is the material and medium that is holding the game together, whether it is a pen and paper board game or a sophisticated VR simulation (Schell, 2008).

Reinhardt (2018) uses the term **gameful** to describe players (or learners) with a disposition that can identify elements of games and play in various situations and leverage them intentionally, for example to gamefully learn in an L2 learning situation. The term is similar to and

Fig. 1. Elements of games. From Schell (2008, p. 42).


Aesthetics
More visible
Mechanics
Story
Technology
Less visible

complemented by **learnful**, "a disposition attuned towards finding learning opportunities in activities not explicitly designed for learning, like vernacular gaming." (Reinhardt, 2018, p. 12). Reinhardt (2018) posits that a learner ought to be both gamefully and learnfully dispositioned towards educational games to make them effective and enjoyable tools for learning. Therefore games shouldn't be used in all learning situations, a view that is shared by most DGBLL researchers.

3

DIGITAL GAME-BASED LANGUAGE LEARNING

Digital game-based language learning (DGBLL) is considered an umbrella term encompassing use of vernacular games, synthetic immersive environments, educational games, gamified applications, interactive fiction as well as the attendant discourses and activities surrounding games in L2TL contexts (Blume, 2019). DGBLL has been studied at least since the 1980s (Culley, Mulford & Milbury-Steen, 1986) and has garnered research interest from multiple disciplines. More recently, the literature on digital game-based language learning has been expanding, although the amount of research is still limited, particularly when it comes to more ambitiously scoped and rigorous studies (Acquah & Katz, 2019; Hung et al., 2018; Peterson, 2013; Xu et al., 2019). However, increasingly robust studies and compilations have recently been published (see, e.g. Reinhardt, 2018; Blume, 2019).

While the potential of DGBLL is widely recognized, most scholars also emphasize that digital games are simply another instructional tool, and not a silver bullet to solve all problems (e.g. Annetta, 2010; Peterson, 2013; Hays, 2005; O'Neil, Wainess & Baker, 2005).

In this chapter, I first introduce a framework that organizes varying approaches to DGBLL under three categories. Then I describe ways to organize games themselves within DGBLL. After that, I turn to the concept of second language acquisition affordances mentioned in section 2.1.2 and describe the ones that are relevant to the thesis goal. Finally, I describe typical language learning design processes.

3.1 GAME-INFORMED, GAME-ENHANCED AND GAME-BASED L2TL

Reinhardt and Sykes (2012) use the term **digital game-mediated** L2TL that roughly corresponds to the more widely established term DGBLL. They further divide game-mediated L2TL into a framework of three approaches based on the role and type of game or gameful application utilized: **game-informed**, **game-enhanced** and **game-based** L2TL**.** In this thesis, I use Reinhardt and Sykes' categorization to refer to these three approaches, but DGBLL to refer to the whole field and approaches in general.

Game-informed L2TL refers to situations where L2TL activities apply game-related theories, but games are not explicitly used (Reinhardt & Sykes, 2012). Reinhardt (2018) asserts that a broad range of L2TL approaches are game-informed in the sense that they have similarities to activities in game studies. In Reinhardt's (2018) classification, game-informed practice includes **gamification**.

Gamification is a trendy approach whereby typically non-gameful activities such as learning or working use game-like elements such as challenges, points, or leaderboards (Deterding, Dixon, Khaled & Nacke 2011). Digital applications for language learning often include gamification

(Blume et al., 2017). Such applications have been studied extensively (Hyunh & Iida, 2017; James & Mayer, 2019; Ye, 2014; Vesselinov & Grego, 2012), but research into the effects of individual gamification elements is limited in the field of L2TL (Reinhardt, 2018).

Game-enhanced L2TL means using existing vernacular games that are not designed for educational purposes (Sykes & Reinhardt, 2013). This approach involves taking advantage of the cornucopia of pre-existing vernacular games and planning learning activities around them. As media artefacts and genuine cultural products, vernacular games can have enormous scope in terms of mechanics and content. They often have vibrant, sometimes multilingual, communities of players (Sykes & Reinhardt, 2013), which can afford meaningful social interactions and narrative explorations in the target language (Reinhardt & Sykes, 2012; Peterson, 2013; Xu et al. 2018). Most apps and games developed specifically for DGBLL lack these communities.

Vernacular games are typically used with L2 learners of intermediate and advanced skill levels, ostensibly because the content and language use tasks involved can be too challenging for beginner learners (Peterson, 2013). Some games can be modified to better accommodate L2TL objectives (Reinders & Wattana, 2012; Cornillie, Clarebout & Desmet, 2012), but this can be difficult or outright impossible depending on the game. Game-enhanced research typically employs immersive games and game-like environments such as multi-player adventure games, multi-user virtual environments (MUVEs), massively multi-player online role-playing games (MMORPGs), 3D adventures and text-based adventures (Hung et al. 2018; Peterson, 2013). Rarely applied genres include simulation, first-person shooter, rhythm-based, exercise and sports games (Peterson, 2013).

Using vernacular games involves numerous challenges. First of all, given the plethora of games available, educators may struggle with finding appropriate titles that fit their needs (Blume et al., 2017; Reinhardt & Sykes, 2012). Additionally, excessively complex game mechanics may obstruct learning (Culley et al.,1986), learners may regard the choice of game as inauthentic (Peterson, 2013). Furthermore, learning activities focusing on communication with other players are not applicable in languages that do not have existing vernacular game communities. Perhaps because of these challenges, researchers and learners often turn a game-based approach.

Game-based L2TL involves the design and use of games that are specifically purposed for language learning (Reinhardt & Sykes, 2012). The game-based approach has the obvious advantage over the game-enhanced approach in that the games and environments can be customized extensively to fit the goals and needs of L2TL practice and research (Reinhardt & Sykes, 2012). This adaptability is a likely reason why most DGBLL research is game-based (Xu et al. 2019; Hung et al. 2018). However, Sykes and Reinhardt (2013) advise not to automatically conclude that game-based methods in L2TL are superior to game-enhanced methods in all situations.

The potential of game-based approaches notwithstanding, creating a completely new language learning game requires considerable resources and a wide breadth of theoretical knowledge and practical expertise (Reinhardt, 2018). Language learning game design has to consider not only game design aspects and L2TL domain aspects, but the integration of both into a single experience. This complexity is reflected in an apparent disconnect between game-based language learning products and contemporary SLA theory, particularly as regards practical competence. Blume et al. (2017) reviewed 50 game-based approaches and found that they predominantly apply structural-behaviourist theory through drill-and-practice activities. This approach means the existing games cater primarily to beginner learners who enjoy simple grammar games (Blume, 2019).

The inherent complexity in designing language learning games reflects their quality. In their scoping review of DGBLL in English language learning research, Xu et al. (2019) compared researcher-designed games to vernacular games utilized in the studies and found that vernacular games outclassed research-designed games in all gameplay quality categories[3]. This issue is exacerbated by the fact that language learners are increasingly game literate and expect a higher quality of learning activities (Acquah & Katz, 2019; Oblinger, 2004). Reinhardt (2018) argues that learners do realize that the aim of educational games is different from entertainment games, and are thus forgiving of shortcomings in representation. Nevertheless, there have been frequent calls for more multidisciplinary collaboration between game studies and SLA researchers and practitioners (Sykes & Reinhardt, 2013; Xu et al. 2019).

3.2 PLAYING TO LEARN AND LEARNING TO PLAY

One way to organize games themselves within DGBLL is to appraise how they relate to learning. Arnseth (2006) identifies two general-level perspectives to learning while playing games: **playing to learn** and **learning to play**. Similar divisions are **extrinsic** and **intrinsic** games (Ang & Zaphiris, 2006), and **exogenous** and **endogenous** games (Squire, 2006; see also Schell, 2008, p. 32).

According to Arnseth, when playing to learn, the implied focus is on learning and gameplay is seen as a means to reach extrinsic goals or gain skills (2006). An example of such an extrinsic, exogenous game might involve a shooting gallery mechanic where the player zaps fish by writing correct verb tenses, although Ang and Zaphiris (2006) argue that any genre of game is suitable. These types of learning games reflect an academic, grammar-translation (GT) teaching style where designs appeal to extrinsic motivation (Reinhardt, 2018). This paradigm is often in use when using new or modified existing games or gamey apps for language learning (e.g. Culley et al. 1986; Neville, Shelton & McInnis, 2009).

When learning to play, on the other hand, the focus is on playing, and learning takes place to enable gameplay (Arnseth, 2006). In vernacular games, this can take the form of merely learning the game mechanics and dynamics better. In language learning games it can mean, for example, learning Korean to be able to convince a security guard to move aside, or learning English to be able to play an English-language game

[3] See Shute & Ke (2012) for the seven core elements Xu et al. evaluated against.

Affordance	**Relation to thesis focus**	**Game mechanics and dynamics**	**SLA/L2 pedagogical principles**
ContextualIzed language learning	Context	Multimodal representations, narratives, progressive designs, form-meaning-use associations	Semantically-related vocabulary learning; **contextualized learning**; **narrative-based learning**; **narrativization**; motivation
Time for L2 Use and Learning	Agency	Game-controlled time (freeze, accelerate, decelerate, jump, repeat); player-controllable time (full, partial)	Time for comprehension, processing, and production; working memory capacity; **agency**, reflection, awareness; pushed output; development of accuracy, fluency, and complexity
Space for Sheltered Practice	Agency	Tutorial zones, levels and areas accessible based on skill, off-network play, moddability	**Scaffolding**; zone of proximal development; socio-affective learning principles; affective filter; willingness to communicate
Goal-Oriented Learning and Feedback	Agency	Game structures and features, e.g. tasks, quests, feedback mechanisms	**Task-based learning, feedback**

Table 1. Gameful affordances for L2 learning, from Reinhardt (2018, pp. 114-115), with relation to current thesis focus and emphases added.

with other English speakers. Games designed following this intrinsic and exogenous paradigm reflect a communicative language teaching (CLT) approach where designs appeal to intrinsic motivation (Reinhardt, 2018; Arnseth, 2006). This paradigm is also commonly in effect in game-enhanced approaches that use vernacular MMORPGs to motivate students to learn (Peterson, 2013).

Squire (2006), commends endogenous games such as Civilization, which treat the instructional context as central to the gameplay, and criticizes exogenous games such as Math Blaster which separate context from gameplay and use gameful elements to make learning more palatable. Will Wright, creator of the Sim series of games, has also remarked that the instructional side is "not something you tack on, it's got to be fundamental to the design" (in Rouse, 2001, p. 446). Taking a more neutral tone, Ang and Zaphiris (2006) emphasize that both approaches and game types are viable. The following section on game affordances informs the process of selecting suitable games in a given language learning context.

3.3 AFFORDANCES

Several scholars have compiled lists and models of the elements of well-designed learning (Amory, 2007; Gee, 2005; Shute & Ke, 2012) and language learning games (e.g. Prensky, 2007; Gee, 2005; Purushotma, Thorne & Wheatley, 2009; Annetta, 2010; Reinhardt, 2018; Sykes &

Reinhardt, 2013). General learning game models such as Amory's game object model (GOM) (2007) tend to have a prohibitively high abstraction level to be of practical use in designing games for a specific purpose such as language learning. Therefore, their primary use might be in evaluating, describing and classifying existing games.

The ecological concept of affordances has been used to describe which kinds of uses digital games and related devices readily lend themselves to (Reinhardt, 2018; Blume, 2019). Reinhardt (2018) uses affordances to provide a framework for inductive study of digital games in DGBLL contexts. Blume (2019) too uses affordances and divides them further into attitudinal and linguistic-cognitive affordances.

Affordances are readily connected with pedagogical principles and game mechanics and dynamics, making them a useful starting point for informing game design, and a framework in which to place insights from other literature. As a good starting point, Reinhardt (2018) lists a total of eight affordances (pp. 114-115; Table 1).

The affordances that are most relevant for this thesis are **contextualized language learning**, **goal-oriented learning and feedback**, as well as **space for sheltered practice** and **time for L2 use and learning**.

3.3.1 Contextualized language learning

Most scholars of DGBLL emphasize the importance of presenting language content in a context[4] (e.g. Thomas, 2012; Sykes & Reinhardt, 2013; Reinhardt, 2018; Squire, 2006), and it is essential to psycho-cognitive and social-informed approaches to SLA as well (see section 2.1.2, also e.g. Larsen-Freeman, 2001; Cook 2013). Games afford contextualization of language through narratives, multimodal representations and simulations of situational context (Reinhardt, 2018).

According to Sykes and Reinhardt (2013), we use narratives and stories to contextualize information and transmit it to others. Sykes and Reinhardt (2013) argue that narratives function as cognitive frameworks where new knowledge can be placed in relation to familiar knowledge and thus retained more readily. In language learning, being able to contextualize vocabulary and grammar in this way allows learners to cognize new connections between meaning and form (Reinhardt, 2018). This sort of implicit learning also happens through first language narratives, for example, when encountering new vocabulary in a text passage.

Recalling the discussion on games in section 2.2.2, narratives are also central to most games. They contain **designed narratives**[5], which are back stories constructed into the game by the designers, but importantly they also engender **personal narratives**[6], which emerge from the subjective gameplay of each player (Calleja, 2007). Following the constructivist view (see section 2.1.1, also Gee, 2005), personal experiences are crucial to learning, since we form thoughts and ideas through our own subjective experiences rather than abstract principles. Both designed and personal narratives contextualize the rules of the game and give them meaning, but they also contextualize language in the same way. For example,

[4] The discussion on contextualization focuses on creating contexts as cognitive frameworks to facilitate learning. These are different from the situational and cultural contexts related to the development of pragmatic competence, which were mentioned in section 2.1.3.

[5] designed narratives and personal narratives are also called context-in-the-game and context of play respectively in Sykes & Reinhardt, 2013

[6] Also called emergent narratives (Juul, 2005, p. 157-159)

a variable integer gets an additional layer of meaning once it is given a name like "health", but the word "health" then also gains an additional meaning within the context of the game. This can be problematic if the meaning in the context of the game differs significantly from the "actual" meaning. For example, in the game Koe, which contextualizes Japanese words as spells, the Japanese word for book (本) is considered a spell that does fire damage - an interesting departure from the word's conventional meaning.

In addition to narratives, games can provide further contextualization in the form of multimodal representations (e.g. combinations of still or moving image, word form, and utterance), as well as form-meaning-use associations (Reinhardt, 2018). Game narratives provide a way to connect these contextualization methods to a coherent whole.

Sykes and Reinhardt (2013) elaborate with a simple speculative example of a bakery game. To build on their designed narrative setup, let us say there is a baker, pie ingredients such as red and green apples that can be used to make pies, and an ultimate goal that the baker must bake the world's best pie to get a scholarship to culinary school. The player then interacts with these elements through gameplay and a personal narrative of successes and failures in making incrementally better pies emerges (Sykes & Reinhardt, 2013). Any encountered target language vocabulary and their multimodal representations are interwoven into this personal narrative context. For example, it is easy to see how certain semantic sets (e.g. *"colours"*, containing *"red", "blue", "green"*) and thematic sets[7] (e.g., *"bakery"*, containing *"flour", "pie", "rolling pin"*) connect to the underlying game theme.

Designed game narratives can range from simple pie-making in a bakery to navigating expansive worlds with interconnected stories that invoke different registers of emotion. Larger narrative contexts have the potential to immerse learners in expansive networks of interconnected vocabulary. However, content on this scale is laborious to create and therefore, this type of immersion is possible primarily through vernacular games (see, e.g. Peterson, 2013). Regarding emotional responses, Reinhardt (2018) cautions that while more intense game narratives and scenarios can evoke more salient, emotional responses that may facilitate word retention, these situations can also inhibit learning if they provoke excessive anxiety.

Reinhardt (2018) argues that story-focused games are most suitable for contextualizing target language (i.e. to promote pragmatic competence), but it is still necessary to afford learning of grammatical knowledge in some way (i.e. to promote linguistic competence). As mentioned throughout this thesis, many DGBLL games or gameful applications[8] adhere to these relatively shallow forms of contextualization. However, as was shown above, the fictional game world provides a way to combine different types of contextualization strategies into a coherent whole. This can be applied to entire games as well: Reinhardt (2018) proposes that extrinsic structural-behaviourist style minigames be placed within the context of a larger intrinsic game narrative.

[7] For differences between acquisition of semantic and thematic sets, see e.g. Tinkham (1997)

[8] e.g. Korean Dungeon, *Duolingo* or Memrise

3.3.2 Goal-oriented learning and feedback

As implied by the bakery example in the previous section, games can structure gameplay into progressions of goals and tasks (Sykes & Reinhardt, 2013). According to Schell (2008), offering meaningful choices on which tasks and goals to pursue imparts the player with a sense of freedom and fulfilment. Sykes and Reinhardt (2013) call this player agency: "to remain motivated to keep playing, players must know what they are doing and believe that they have [a] choice in doing it" (p. 112).

Player agency is at its highest in games that contain a sufficiently complex set of interacting rules, meaningful choices, and a broadly preset goal or set of goals (Juul, 2005). High-agency, open-ended designs offer a large number of ways to reach the goal state and engender an **emergent** play experience. In contrast, low-agency, **linear** experiences result from progressive designs which limit the ways to progress, e.g. narrative-driven games with a single preset storyline (Juul, 2005). Many successful games compromise between sections of emergent and linear play (Sykes & Reinhardt, 2013).

Agency in games parallels learner agency in task-based language teaching (TBLT; see section 2.1.2). Balancing between learning-driven and learner-driven TBLT tasks can be challenging, but embedding them into a game provides a natural way of balancing linear and emergent gameplay and managing agency (Sykes & Reinhardt, 2013). A feeling of high agency during learning is important because it builds the learner's confidence and promotes autonomy in language use, both of which are called upon when confronted with real-world language use situations (Sykes & Reinhardt, 2013). Providing choices in a gameful way can promote learner agency in the same way it promotes player agency.

Game tasks often involve problem-solving, which is central to learning in general (Shute & Ke, 2012; Gee, 2005). However, problem-solving as a skill is not as tightly coupled to language learning as it is to, for example, learning physics or mathematics. In DGBLL, completing an in-game task should entail either successful language use or demonstrate language knowledge (Reinhardt, 2018). In the first case, the role of the task is similar to a learner-driven task in formal TBLT practice. In the latter case, the task can be merely selecting a correct L2 translation for a noun such as *"apple"*. In both cases, success should advance the player's status or progress in the game world somehow (Reinhardt, 2018).

Embedding words as part of goal-oriented activities such as pie-making can make operational vocabulary (e.g. *"bake"*, *"mix"*, *"pie"*) easier to retain than incidental, peripheral vocabulary that is not crucial to completing game goals (Shintaku, 2016). For example, the bakery game might include words such as *"kitchen sink"* or *"jar"* that show up when clicking on certain graphical elements, but do not show up in the actual pie-making gameplay and therefore are not repeated.

Feedback is crucial for both games and language learning. In games, feedback on progress is needed for players to maintain a sense of agency (Schell, 2018). Games employ various feedback mechanisms such as fail states, levels, points, progress bars, tips and hints, and inactive and active game elements (Sykes & Reinhardt, 2013). In language learning contexts, feedback can be correctional after-the-fact information such as pointing out errors in grammatical form, or it can be informative just-in-time feedback that guides the learner forward towards correct language use (Sykes & Reinhardt, 2013). The latter kind of timely feedback and information is sometimes preferable because it minimizes cognitive overload and allows the player to adjust their behaviour accordingly (Shute & Ke, 2012; Gee, 2005; Sykes & Reinhardt, 2013; Prensky, 2007). Cornillie et al. (2012) suggest integrating feedback systems into the game design as part of the narrative, for example, as lines in interactive conversations with non-player characters (NPCS).

There are practical challenges to designing successful feedback systems. Giving too harsh or punitive feedback can lead to a decrease in learners' self-confidence and increase fear of failure, feedback takes time to give and process, and interpreting whether or not an error occurred can be difficult because of subjective language variation between learners (Sykes & Reinhardt, 2013). For instance, some questions might have multiple acceptable answers that should all be considered valid, and advanced language users often resort to shortcuts, particularly in colloquial language (Sykes & Reinhardt, 2013). This unclarity is a challenge for human evaluators and even more challenging when defining automated feedback systems.

Automated feedback systems rely on natural language processing and contextual information to administer feedback accurately. One key issue in natural language interfaces is related to intent classification or finding out what the intended outcome of a given utterance is (e.g. Meng & Huang, 2017). For example, when a user tells a voice-controlled interface, "get me to work", the processor must deduce what is meant by "getting", "me" and "to work". This uncertainty is challenging as is, but free form text in a language learning context adds the possibility of grammatical errors to the mix. One way to avoid this particular challenge is to explicitly provide intent in the source language before prompting target language output.

Ideally, language learning games should be able to deduce the learner's skill level and intent and adapt the feedback and challenge levels accordingly (Sykes & Reinhardt, 2013).

3.3.3 Sheltered practice and time for L2 Use and learning

Instructional scaffolding, also called adaptation, is an instructional technique that varies the difficulty and style of teaching content based on a learner's learning style and ability (Moreno-Ger, Burgos Martínez-Ortiz, Sierra & Fernández-Manjón, 2008). Scaffolding is closely related to Vygotsky's (1934/1986) zone of proximal development (see section 2.1.2). In a DGBLL context, assistance can come from other players, the instructor, or the game and its feedback system (Sykes & Reinhardt, 2013). Good digital games implement ZPD through adaptive challenges.

A good game fosters player engagement and motivation by presenting them with incremental challenges (Juul, 2005). Vernacular digital games provide several existing techniques for scaling challenge levels that can inform the design process of language learning games. Such techniques include limiting playable areas, limiting the controllability of time, and incrementally introducing new skills for the player to master (Juul, 2005; Reinhardt, 2018; Sykes & Reinhardt, 2013).

Limiting playable areas often takes the form of tutorial locations for safe practice in the beginning of the game or periodically when the player is required to learn a new gameplay mechanic or skill. However, in L2 learning contexts, it has been shown that overly complicated or foreign mechanics and interfaces obstruct learning (Culley et al. 1986; Peterson, 2013). Therefore, instruction on game rules and mechanics should be available in the learner's first language (Reinhardt, 2018). It may even be prudent to use mostly familiar mechanics when designing L2 learning games. In any case, the user interface of the game should be clear and easy to use with choices presented explicitly to imbue the player-learner with a feeling of agency.

However, even though good games may excel at scaling gameplay challenges, they are not designed to scale language challenges (Reinhardt, 2018). However, scaffolding of both gameplay and instructional language use can and should be accounted for in DGBLL designs (Shute & Ke, 2012; Gee, 2005). To design around this, Reinhardt (2018) proposes that games can either 1) fix the language challenge level and increase gameplay challenges, 2) fix the gameplay challenge level and increase language challenges, or 3) create different versions of each gameplay task to suit different language proficiency levels.

For a language learner, a game in itself constitutes a space for sheltered practice compared to face-to-face situations. This feeling of control and anonymity can help alleviate anxiety related to fear of failure and loss of face (Reinhardt, 2018). MMORPGS, in particular, have been found to provide a safe and supportive environment for target language production, affording creativity and reducing anxiety (Xu et al. 2018).

Time in games can be split between play time, or time in the real world that is spent playing, and fictional time, or time in the game world (Juul, 2005). Juul defines dead time as time a player is performing "unchallenging activities for the sake of a higher goal" (p. 155). In the DGBLL context, this could mean having to grind through easy content in order to get the game to the appropriate language level, or walking through previously explored areas. To keep play enjoyable, such dead time can be minimized by either adapting the system to the player's skill level or giving them more control over time.

Allowing players to control time by pausing, slowing down or speeding up enables careful observation, contemplation and strategizing and is typical of, e.g. text adventures and turn-based strategy or role-playing games (Reinhardt, 2018). Game-controlled time, by contrast, constrains the player to react in real-time or under time pressure and promotes skills that require speed, reaction time and hand-eye coordination (Reinhardt, 2018). According to Reinhardt, the key for DGBLL games is to

> "strike the right balance between player-controllable and game-controlled time mechanics, enough to contribute to motivation, agency and awareness on [the] one hand, but also fluency, risk-taking and automaticity on the other"
>
> Reinhardt, 2018, p.121

To improve fluency, time pressures can be adjusted by limiting the available time or by rewarding faster responses (Reinhardt, 2018). To improve accuracy, time pressures should not be adjusted, but each inaccurate attempt could reduce the potential reward (Reinhardt, 2018).

Related to time manipulation is task repetition, which is considered central to all forms of learning (Thomas, 2012). Allowing or forcing task repetition in learning games can be beneficial for understanding and producing language (Reinhardt, 2018). On the other hand, limiting task repetition can be a harsh way to create pressure and a feeling of meaningful consequences[9]. According to Juul (2005), quality games also maintain a sense of freshness by preventing players from relying on one optimal strategy. Similarly, in language learning games, learners should be encouraged to use more challenging language patterns rather than, for example, repeating the same sentence structure over and over.

Accurate scaffolding methods require constant awareness of the learner's skill level as it evolves. Heil, Wu, Lee and Schmidt (2016) reviewed mobile language learning applications and argue that learning software has an advantage over human instructors in that they can reliably record all learner input as it happens. Skill level can then be algorithmically inferred based on the resulting wealth of data (Heil et al. 2016). This kind of data collection, learner skill level modelling and adaptive scaffolding is the domain of intelligent tutoring systems, or ITS (Heil et al., 2016; Maragos & Grigoriadou, 2005).

ITS's and adaptive scaffolding is still missing from the vast majority of mobile language learning apps (Heil et al., 2016) and learning apps in general (Blume et al., 2017). This lack of adaptation is unfortunate for new users with an intermediate or advanced skill level, who will need to start from a beginner level and work their way up, causing long periods of dead time. This issue could be mitigated by making all content available from the beginning. Many open-world vernacular games are not adaptive in the sense that they would analyze player performance and behaviour and change available content or challenges based on that. Rather than impose these kinds of top-down constraints, such games instead provide the necessary information for the player to infer what their skill level is, and which areas they should improve on. For example, low-level players who wander to a high-level area in *World of Warcraft* will quickly see that it is out of their league (Sykes & Reinhardt, 2013). Language learning games could do the same - even if a learner accidentally or intentionally

[9] (e.g. using a permanent death mechanic; see section 4.2.2)

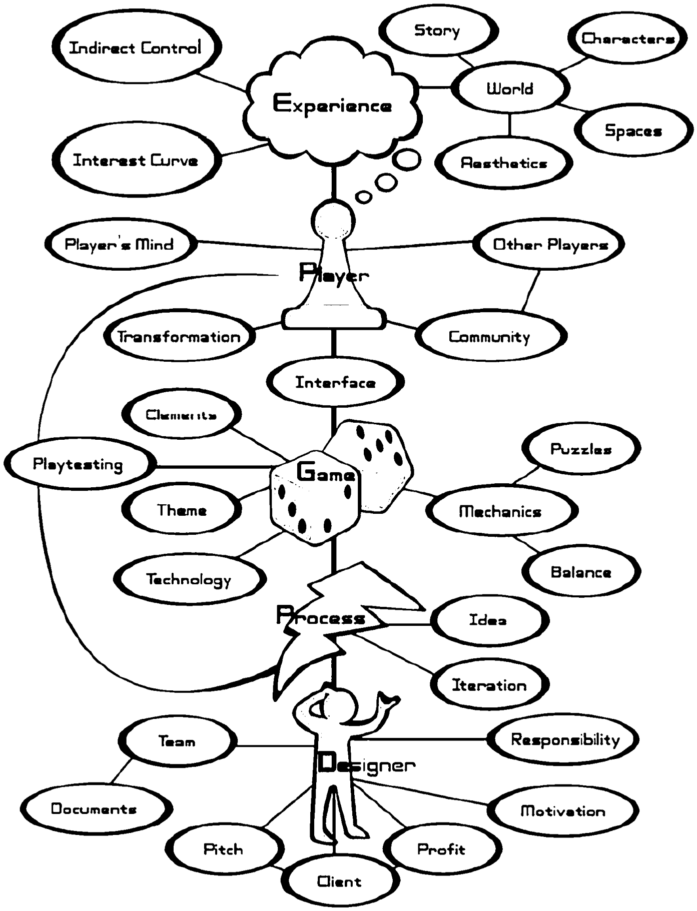

Indirect Control
Story
Characters
Experience
World
Spaces
Interest Curve
Aesthetics
Player's Mind
Other Players
Player
Transformation
Community
Interface
Elements
Playtesting
Game
Puzzles
Theme
Mechanics
Technology
Balance
Process
Idea
Iteration
Team
Responsibility
Designer
Documents
Motivation
Pitch
Profit
Client

Fig. 2. The Game design process (from Schell, 2010, p. 463)

jumps to overly advanced exercises, proper feedback will eventually guide the learner to exercises appropriate to their level.

3.4 APPROACHES TO NARRATIVE-BASED LEARNING GAME DESIGN

The purported difficulty of designing DGBLL games has been alluded to throughout the preceding chapters. This section aims to show possible reasons for this and describes ways to approach DGBLL design. Considering the widely reported dearth of DGBLL applications that reflect contemporary L2TL practices (e.g. Blume 2019; Xu et al. 2019), there is a fair amount of guidelines and frameworks for game-based learning design, ranging from the more practical (Sykes & Reinhardt, 2013; Reinhardt, 2018; Moreno-Ger et al. 2008) to the theoretical (e.g. Purushotma et al., 2009; Annetta, 2010; Sykes & Reinhardt, 2013).

The basic design process has been widely established as an iterative loop of analysis and ideation, synthesis, and validation, regardless of the

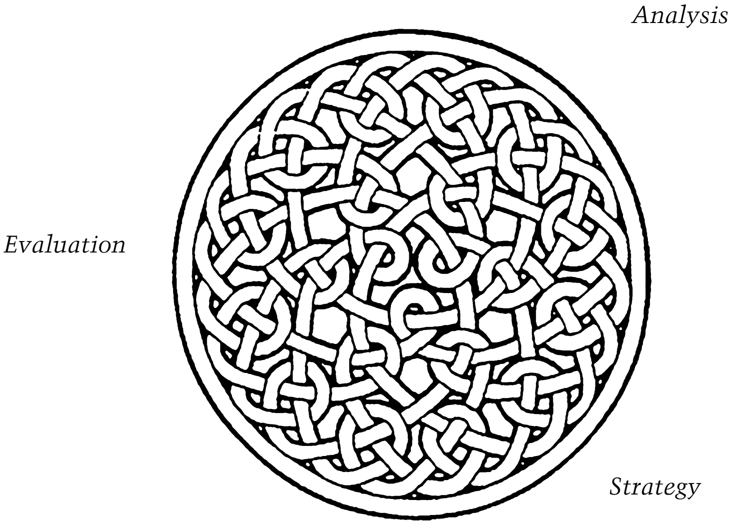


Fig. 3. A more realistic representation of instructional design (from Smith & Ragan, 2004, p. 10)

design objective. This iterative process can be applied both to instructional design (Smith & Ragan, 2004) and game design (Schell, 2008), and is unsurprisingly viable for learning game design as well (Reinhardt, 2018).

According to Smith and Ragan (2004), the instructional design process iterates between analysis, strategy and evaluation activities which typically occur concurrently and interweave in non-linear ways. Schell (2008) concludes his book with a graph of the whole game design process (Fig. 2), which is somewhat messy-looking (likely by design) but likewise includes elements of an iterative design process in the relationships between the designer, process, game and player.

Learning game design differs from "regular" game design and "regular" instructional design in that it has to account for both learning experiences and objectives and game experiences. Combining instructional design and game design practices can be challenging because game design is not a precise science (Moreno-Ger et al., 2008). However, instructional design is not exactly straightforward either (see Fig. 3; Smith & Ragan, 2004).

3.4.1 Analysis and ideation

Reinhardt (2018) describes a very practice-oriented guideline for the initial ideation stages of game design, a list ostensibly meant for L2TL practitioners and beginner game designers who wish to get more acquainted with the topic. Like game designers Schell (2008) and Rouse (2001), Reinhardt (2018) considers it essential to develop a fundamental understanding of games by analyzing, playing and modifying a variety of existing games and brainstorming and prototyping new game ideas. For the ultimate goal of designing L2 learning games, Reinhardt (2018) emphasizes the importance of continuously considering how language relates to different features of games during these analysis activities.

The designer's understanding of the relationship between language learning and gameplay in the initial ideation phase can have fundamental effects on the entire game. Some scholars encourage using learning objectives as starting points and then devise the rest of the game to realize those objectives (e.g. Sykes & Reinhardt, 2013; Amory, 2007). However, this approach is not necessarily appropriate in all situations. It runs the risk of treating learning objectives separate from the rest of the game throughout the entire design process, easily resulting in extrinsic and exogenous games where the connection between gameplay and content is not evident. As discussed in earlier sections, these kinds of games do have their uses (see section 3.2), but for intrinsic, endogenous games, the starting point might need to be different.

Let us consider what this learning objective centred approach would look like in a "regular" game design process. A parallel for learning objectives in games are win conditions and gameplay skills. Once the player has completed a game, playing the game has effectively taught them the skills necessary to beat it. However, most game designs are not based on reaching win conditions or teaching gameplay skills, but on engendering game experiences[10] (Schell, 2008). It follows that a learning game following the learning to play paradigm (i.e. an intrinsic, endogenous game) should require a player-learner to learn the instructional domain in order to complete it. This requirement necessitates a closer connection between gameplay and the instructional domain (Ang and Zaphiris, 2006; Squire, 2006; Hodhod, 2010). Designing language learning games that follow the learning to play paradigm is then more about designing gameful language use experiences, which in turn engender specific learning outcomes (de Freitas & Maharg, 2011).

Therefore, the minimum result of the initial analysis and ideation phase depends on whether the design goal is to create an extrinsic, exogenous game or an intrinsic, endogenous one. In the first case, a collection of learning objectives is a sufficient starting point. In the latter case, the objectives should be interwoven into gameful language learning experiences that engender learning and make the experience enjoyable. To paraphrase Schell (2008, p. 21), a learning game designer should think about past language learning and gameplay experiences and ask themselves three questions:

- What gameful language learning experience do I want the player-learner to have?
- What is essential to that experience? and
- How can my game capture that essence?

Additional requirements could be added on top of the learning objectives and learning experiences. For example, Moreno-Ger et al. (2008) suggest integrations with other online platforms, adaptive systems to adjust the

[10] Consider a game designed on a core premise that the player should be able to "manage health points and complete accurate successions of attacks on opponents while evading opponent attacks" versus a premise that a player "is a cunning diplomat that must use stealth and subterfuge to undermine a mad king's evil plot". The reason the latter might seem more appealing is that it primes the design of a game experience

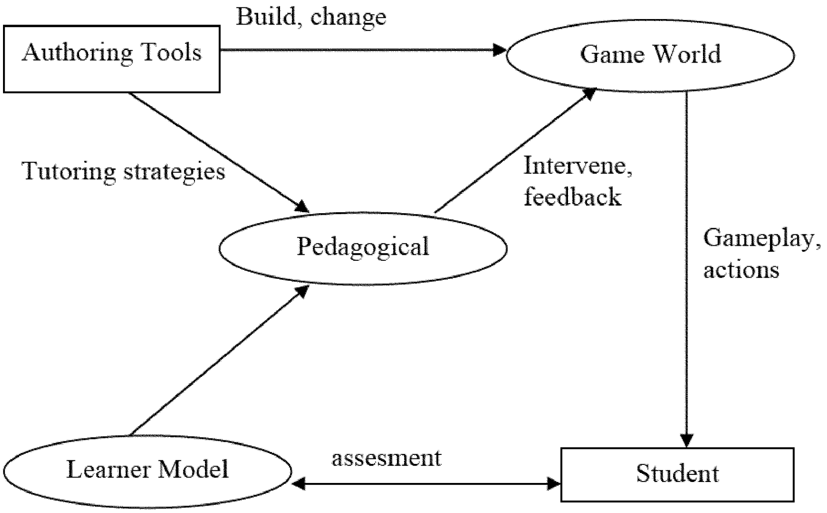


Fig. 4. Architecture of an intelligent educational game. Maragos and Grigoriadou (2005).

game content to suit various types of learners, and integrated assessment systems or intelligent tutoring systems to facilitate just-in-time feedback and logging progress metrics (Moreno-Ger et al., 2008).

3.4.2 Synthesis

Moreno-Ger et al. (2008) present some practical guidelines for educational game design that are primarily aimed at L2TL researchers and practitioners not well versed in game design practices. As such, Moreno-Ger et al.'s (2008) recommendations are to stick with established genres and pick a suitable one for the educational requirements. In contrast to this, Reinhardt (2018) advocates a more rigorous approach of following vernacular game design practices with added consideration of how language and language learning is related to them. Reinhardt's (2018) approach to synthesis is to:

1. Create and develop game worlds
2. Write interactive narratives into those worlds to understand how game dialogues work
3. Imagine mazes, puzzles and playgrounds to develop non-linear thinking
4. Design game tasks, features and win conditions
5. Design mockups, storyboards and decision trees

Schell (2008) and Rouse (2001) describe similar activities in various order, implying that there is no exact sequence and the activities likely interweave much like in instructional design (Smith & Ragan, 2004).

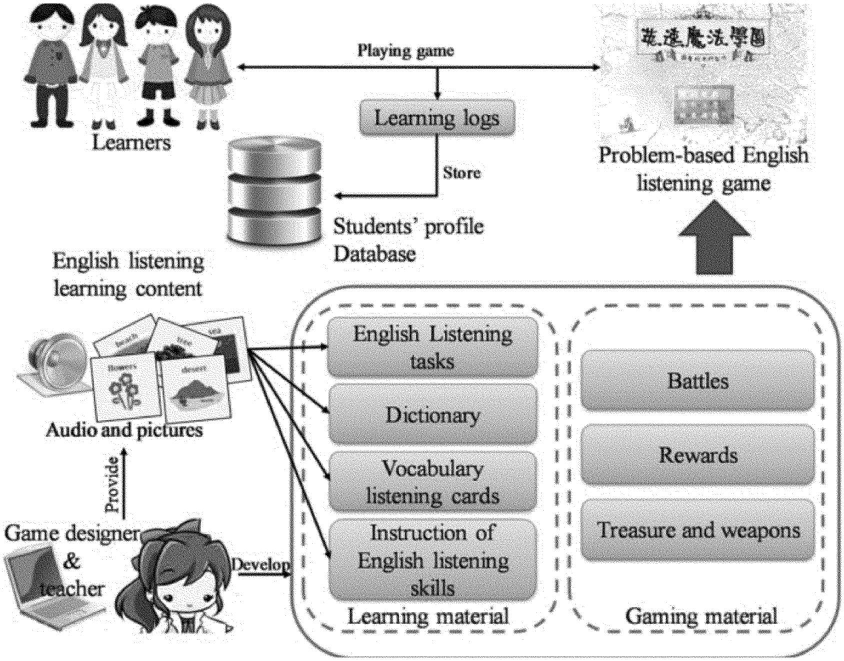

Playing game
Learners
Learning logs
Store
Students' profile Database
Problem-based English listening game
English listening learning content
Audio and pictures
Provide
Game designer & teacher
Develop
English Listening tasks
Dictionary
Vocabulary listening cards
Instruction of English listening skills
Learning material
Battles
Rewards
Treasure and weapons
Gaming material

Fig. 5. Architecture of a problem based english listening game. From Hwang, Hsu, Lai and Hsueh (2017).

However, Reinhardt argues that designing thematically coherent tasks, features and win conditions is easier to do when some idea of a back story and world already exists (2018). This world does not necessarily need to be extensive and fully realized. Juul (2005) argues that all fictional worlds are incomplete and that players complete gaps in narratives and fictions by using their prior knowledge of game conventions and the real world. Therefore, a back story with sufficient cues to fuel the imagination can be perfectly adequate.

The assumption is that, compared to simply using existing genres like Moreno-Ger et al. (2008)., Reinhardt's (2008) approach leads to a tighter coupling between language learning goals and game tasks using insights like the ones presented in section 2.4. It also avoids imposing the desired learning experiences into ill-suited mechanics.

The practical guidelines mentioned above do not venture to actual development, and as such do not present models or architectural plans of digital learning games. However, a collection of research papers describe the architecture of their experimental games for language learning (Hwang, Hsu, Lai & Hsueh, 2017; Culley et al.,1986) and other learning contexts (Maragos & Grigoriadou, 2005; Hodhod, 2010).

Maragos and Grigoriadou (2005) present a model architecture of an intelligent educational game, used mainly as a framework to discuss their intelligent tutoring system. In this architecture (Fig. 4), authoring tools are used to create a game world and a pedagogical model that is acted upon by a learner model. As the learner or student plays the game, actions are fed into and assessed by the learner model, which then informs

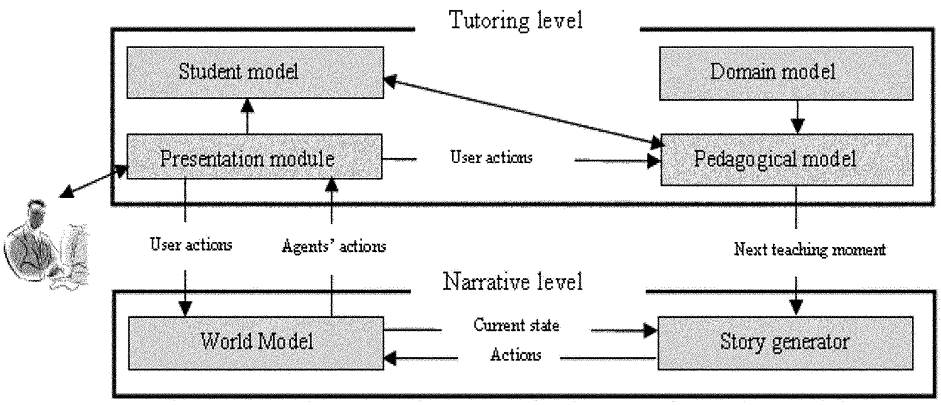


Fig. 6. AEINS architecture, from Hodhod (2010).

the pedagogical model on what kind of interventions or feedback are needed.

Hwang et al. (2017) developed a problem-based English listening game using RPG Maker, a tool for creating Japanese style RPG games. Their game development process and game architecture is depicted in Fig. 5. Hwang et al. (2017) do not describe the development process in the paper, but it can be reasonably inferred based on the figure they provide. Ostensibly, game designers worked with instructors to create multimodal representations for the textual learning materials, which were validated and developed by the instructors. These materials were then codified into a game database using RPG maker, which already contains a set of medieval-themed RPG style graphic assets, mechanics and features such as treasures, battles and levels. The game also contains a logging system that captures "learning status and learning behaviours" as learners play the game (Hwang et al., 2017, p. 28). The content does not seem to be directly related to the setting of the game. For example, in a screenshot presented in the paper, the setting appears to be a medieval mine, but the dialogue involves meeting strangers online (Hwang et al., 2017).

Culley et al. (1986) developed a narrative text adventure game that uses natural language as an input interface. Learners write L2 commands to manipulate and explore the text-based world. Culley et al.'s program consists of four high-level components: a lexical-morphological lookup routine, a parser and meaning extractor, a state changer and a message generator.

Hodhod (2010) created an interactive narrative-based game for learning basic ethics. Her architecture (Fig. 6) consists of six modules: the student, domain, pedagogical, presentation, story generator and world modules. As the player-learner interacts through the presentation module, the pedagogical module assesses their current learner state and informs the story generator on what kind of situation the learner should encounter next. The resulting narrative then outputs back to the user. (Hodhod, 2010)

Chen and Lee (2018) developed a scenario-based educational game for teaching English as a Foreign Language (EFL) vocabulary to young children. In their game, the player takes on the role of a shop manager who serves NPC customers in different scenarios. The sole scenario task is a "fill-in-the-blanks" task involving matching a word to an image from multiple choices. Players can also study word-translation pairs in a "subject learning" area. The game system tracks learner responses to the multiple-choice questions and uses this data to highlight words that are causing difficulties. The system architecture is described on a high level as the three interrelated nodes of application scenario, subject learning and learning regulation. (Chen & Lee, 2018)

All of the architectural models covered above have separate components or modules for the learning domain and the game-playing domain. Most also include a clear separation between pedagogical models and student/learner models and recognize a need to maintain an up-to-date model of the player-learner's instructional domain knowledge throughout gameplay. Maragos and Grigoriadou and Hwang et al. also appreciate the role of educators in creating the pedagogical content, although only Maragos and Grigoriadou explicitly include authoring tools in their model.

3.4.3 Validation

Testing and validation is a vital part of any design process. According to Schell (2018), essential methods of game testing are focus groups, quality assurance testing, usability testing, and above all, playtesting. Schell (2018) emphasises the need for playtesting because it validates whether or not the game engenders the desired experience. Playtesting can and should be done from early on in the design process and repeated as much as possible (Schell, 2018). Schell mentions four common playtester groups: the game developers themselves, the developers' friends, expert gamers, and "tissue testers", or people who have never seen the game before (2018). All tester groups have their pros and cons, so it is best to test with all of them as much as possible (Schell, 2018).

Korhonen (2010) argues that expert evaluators supplied with proper evaluation heuristics can find playability issues as accurately as regular playtesters. However, Korhonen's study only investigated testing of a relatively simple 3D action/puzzle game on Nokia N73 mobile phones, so the generalizability of the study to modern platforms is somewhat suspect. Nevertheless, the result indicates that expert evaluation might be a viable option in the case that proper playtesting is not possible.

In addition to gameplay, learning games need to test and validate learning outcomes. This necessity can make it challenging to keep language learning game development suitably rapid. DGBLL validation tends to focus on learning outcomes rather than playtesting. Typically, rigorous and time-intensive studies are considered a requirement to accurately measure the effectiveness of DGBLL applications (e.g. Peterson, 2013; Xu et al. 2019), but shorter quasi-experiments might be sufficient to indicate improvement (e.g. Hwang et al., 2016). One way to pre-validate the pedagogical content in language learning is to ground it on proven SLA theory, which should lead to predictable learning (Sykes & Reinhardt, 2013).

However, this does not entirely compensate for properly validating the learning outcomes themselves (Sykes & Reinhardt, 2013).

In summation, game design for DGBLL appears to be a conglomeration of two messy processes of instructional design and game design, resulting in a similarly messy activity. Because of the inherent messiness of the process, there are not any straightforward design methodologies that guarantee successful designs, as opposed to, e.g. rigorous user-centric design. Perhaps the best method is to apply Schell's (2008) starting point to game design:

> "When you have a clear picture of your ideal experience, and its essential elements, your design has something to aspire to. Without that goal you are just wandering in the dark."
>
> Schell (2008, p. 21)

4

METHOD

This chapter describes my process in creating a conceptual interface prototype of a language learning game based on the research question and backed by the literature reviewed in the previous chapters.

4.1 IDEATION

To arrive at some starting point for my game design, I followed the steps outlined in section 3.4. As mentioned in the introduction chapter, my goal is to create a game that contextualizes language through interactive narratives and other game elements and gives the player a degree of both player and learner agency on how to proceed through and complete the game. The goal is, therefore, to create an intrinsic, endogenous language learning game. Therefore, as a good starting point, I considered the learning objectives as well as the language learning and gameplay experiences I want the game to engender for the player-learner, and what is essential to those experiences.

Recalling the introductory chapter and section 2.1.3 on interlanguage pragmatics in Korean, the proposed language learning objective is improving the learner's understanding of how situational context affects pragmatic use of Korean.

Following Schell's advice (section 3.4.1) I thought of some language learning experiences I would like to create. For me, memorable target language use experiences have been completing a given real-world task (e.g. ordering food) or resolving a problematic situation (e.g. explaining that I forgot my wallet and have to go get it in order to pay the bill). These are short beginner-level tasks and situations, and the rewarding feeling diminishes quickly after similar subsequent experiences; for instance, I no longer get a surge of pride when I successfully order a sandwich in English. These real-world situations contain an element of risk and meaningful consequences: make the wrong choice or a mistake and you might end up having to eat unappetizing food or getting in an argument with the restaurateur. While the stakes, in this case, are admittedly low, the risk inherent in these situations distinguishes them from low-risk out-of-context learning activities.

Considering the initial thesis goals and the learning experiences above, I arrived with some initial requirements for the proposed game:

- A narrative context that affords settings such as restaurants or grocery stores
- Tasks involving dialogues and choices with meaningful consequences

Cross-referencing these requirements affordances in section 3.3 gave me some ideas for mechanics that support the desired learning experiences

Essential learning experiences	Affordance (See section 3.3)	Potential mechanics and features
Narrative context in various settings	Contextualized language use	Multimodal representations, narratives, progressive designs, form-meaning-use associations
Tasks and choices with meaningful consequences	Goal-oriented learning	Tasks, quests, levels

Table 2. Initial ideas for mechanics and their related affordances, learning experiences and gameplay experiences.

(Table 2). There is a straightforward mapping from the learning experiences to the mechanics of multimodal representations, narratives, progressive designs, form-meaning-use associations, tasks, quests, tutorial zones, and levels based on player ability.

To further develop ideas on how to implement these mechanics and affordances, I did some benchmarking of vernacular games and language learning games and applications. The aim of benchmarking was not to do a comprehensive survey but rather to inform the game design and ideation process, so the selection of games is relatively sparse. Vernacular game selection is based on the requirement that each game should include at least three of the mechanics from Table 2. I selected language learning games and applications based on whether or not they included narratives. I benchmarked the games and applications either by playing them myself or by watching gameplay videos or streams by other players.

4.2 BENCHMARKING VERNACULAR GAME MECHANICS

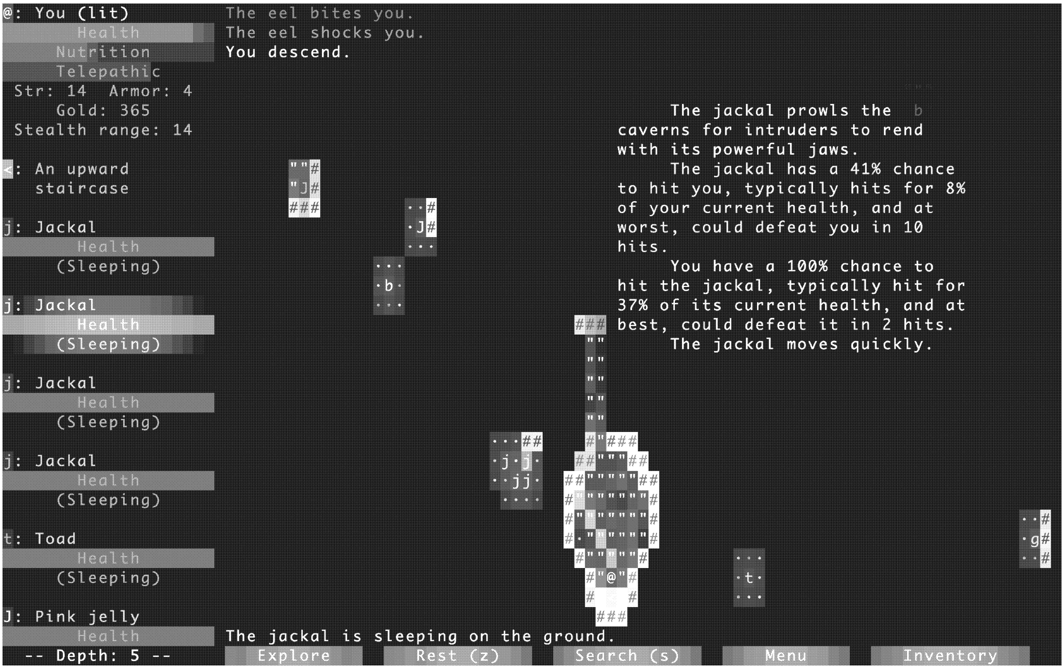
The benchmarked vernacular games and applications include adventure games (*Space Quest*, *Grim Fandango*), role-playing games (*Baldur's Gate*, *Pillars of Eternity*), roguelike games (*Faster than Light*, *Slay the Spire*, *Brogue*), and survival-action game hybrids (*State of Decay 2*, *X-COM 2*).

4.2.1 Narratives and progressive designs

The role of narratives is diverse across the reviewed game types. Most games feature a mechanic of exploration as a means of navigating and learning about the fictional narrative world. Exploration is motivated in varying degrees by discovering new parts of the fictional world and by gaining a gameplay advantage through better positioning or useful items or characters. This is partly affected by game design, but also by the player's disposition (whether or not they are interested in the narratives).

The **adventure games** *Space Quest* and *Grim Fandango* are puzzle-based narratives. These stories progress linearly, and the gameplay is essentially a series of puzzles that move the story forward. There is some exploration, but most of it is centred on finding solutions to puzzles.

The **role-playing games** (RPGS) *Baldur's Gate* and *Pillars of Eternity* have the most meticulously designed fictional worlds among the


@: You (lit)
Health
Nutrition
Telepathic
Str: 14 Armor: 4
Gold: 365
Stealth range: 14
<: An upward staircase
j: Jackal
Health
(Sleeping)
j: Jackal
Health
(Sleeping)
j: Jackal
Health
(Sleeping)
j: Jackal
Health
(Sleeping)
t: Toad
Health
(Sleeping)
J: Pink jelly
Health
-- Depth: 5 --
Explore
Rest (z)
Search (s)
Menu
Inventory

The eel bites you.
The eel shocks you.
You descend.

The jackal prowls the caverns for intruders to rend with its powerful jaws.

The jackal has a 41% chance to hit you, typically hits for 8% of your current health, and at worst, could defeat you in 10 hits.

You have a 100% chance to hit the jackal, typically hit for 37% of its current health, and at best, could defeat it in 2 hits.

The jackal moves quickly.

The jackal is sleeping on the ground.

Fig. 7. *Brogue*, a text-based roguelike

reviewed games, reflecting their focus on immersive narrative experiences. While the main stories in RPGs are relatively static, there are side stories that can branch out based on the player's choices. Exploration is a way to discover more about the game world, but also to discover new characters, items, and quests. RPGs afford extensive customization of the main character and other controlled characters, which further engenders personal narrative experiences.

The **survival-action hybrids** *State of Decay 2* and *X-COM 2* have somewhat shallower narratives, and their gameplay is arguably more centred on combat and exploration. The player controls procedurally generated characters with relatively vague or non-existent backstories and personalities, at least compared to the role-playing games. The overarching game goal is linear. Exploration is motivated more by collecting items and gaining tactical advantage than revealing new narrative features.

The **roguelikes** *Faster than Light*, *Slay the Spire* and *Brogue* have the least detailed storylines and characters. In these games, the levels are procedurally generated, which makes it difficult to have very complicated designed or emergent narratives that still feel like coherent experiences. As an exception, *Faster than Light* has enough depth to afford some level of role-play within emergent storylines, but these games are ultimately more about experimenting with game dynamics and optimizing strategies across multiple playthroughs than engaging narratives. Exploration is similar to the survival-action hybrids.

4.2.2 Tasks and quests

Among the games I benchmarked, there is considerable variance between game tasks, choices and consequences. Interestingly, all games except *Space Quest* and *Brogue* include dialogue options as a mechanic.

The adventure games are based on a linear progression of puzzles that almost invariably have a single solution. *Grim Fandango* has dialogue options, but they are simply a puzzle-solving mechanic rather than actual choices that would, for example, branch the narrative. *Space Quest* has failure states, but they are easy to recover from by loading a savegame (provided the player saves periodically). As such, there is relatively little meaningful choice or consequence involved in the adventure games.

Tasks in the RPGs are structured under the main storyline quest and side quests. Dialogue options are sometimes a straightforward narrative or puzzle-solving tool like in adventure games, but they can also affect story outcomes drastically. Choices can introduce new opportunities for quests, or lead to losses like permanent injuries or even death. However, losses can usually be recovered from by loading a savegame or casting a spell. The player also has considerable agency in shaping the main character and side characters as well as in their handling of combat situations.

The survival-action hybrids and roguelikes have little choice in terms of the main narrative. There are often side quests, but they are rarely as involved as in RPGs and do not necessarily affect the main narrative. Tasks are typically variants of collecting items, running errands or defeating enemies. Choices in survival-action hybrids and roguelikes carry more risk than the other game types, as character and player deaths are permanent and recovery is usually not an option. Choice in these games is, therefore, more about managing risk, choosing enjoyable tasks and gaining a gameplay edge than branching a designed narrative. The unrecoverable nature of failures makes both the risks and rewards higher as the game progresses.

Roguelikes introduce an additional level of meaningful consequence to failures by procedurally generating the game environment at the start of a playthrough. This makes each playthrough feel unique. However, risk-aversion tends to increase as the player feels more invested in a single playthrough and its unique world and characters. The risk of losing everything because of a single mistake can create remarkable experiences of success and failure, but it is not conducive to language learning if it inhibits creative experimentation with language.

4.2.3 Multimodal representations

Most of the games I reviewed feature multimodal representations that employ visual imagery, sound and text, except for *Brogue*, which only uses text and symbols to represent game objects. In terms of multimodal representations, better categories to classify the games are **text-based**, **2D** and **3D games**.

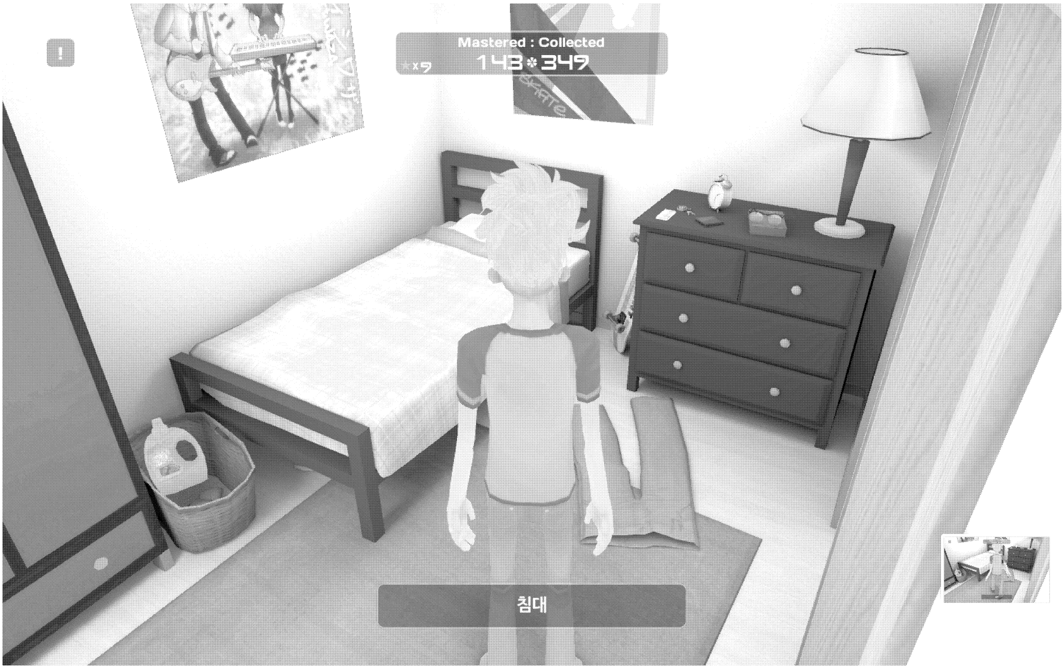


Fig. 8. *Influent*, an immersive 3D language learning environment

The sole text-based game benchmarked is *Brogue*. It stands out with its soundless, fully symbol-based representation (Fig. 7), which is surprisingly immersive but would not necessarily work in a language learning game as the symbols do not carry as much contextual information as images. *Brogue* does not feature sound.

The 2D games (*Space Quest*, *Baldur's Gate*, *Pillars of Eternity*[11], *Faster than Light*, *Slay the Spire*) and 3D games (*Grim Fandango*, *State of Decay 2*, *X-COM 2*) all employ visual images to signify objects and actors in the game world, but use symbols to signify game features and more abstract concepts (e.g. health, levels, skills). There is no significant difference between 2D and 3D images in terms of their ability to carry contextual cues, so they are both equally viable means to contextualize language. However, the 3D games arguably afford the player to embody the character inside the game world better than the 2D games by allowing more camera movement and using audio cues to situate the player more immersively.

4.2.4 Takeaways

Key takeaways from my benchmarking of vernacular game mechanics include the following:

- Designed narratives afford predictability of experiences and deeper contextualization
- Emergent narratives provide variety in game experiences
- Dialogues are a useful and well-established mechanic to introduce choice into a narrative-based game.

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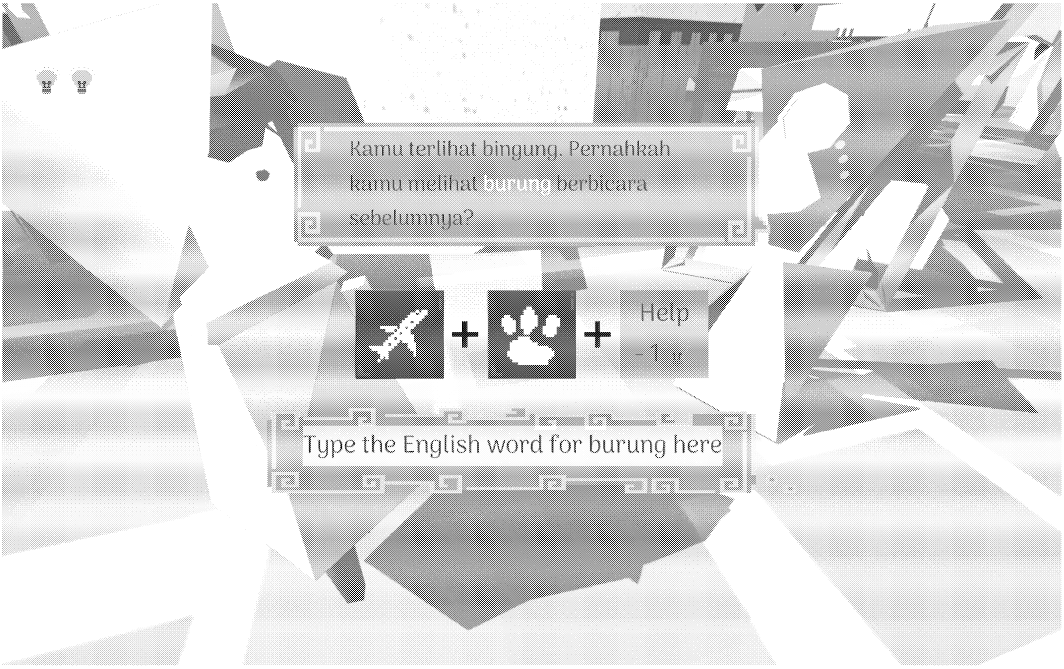
[11] pillars of eternity is included as a 2D game, even though it is technically 3D rendered, because the camera angle is fixed in one position and never changes.


Kamu terlihat bingung. Pernahkah kamu melihat burung berbicara sebelumnya?

Type the English word for burung here

Fig. 9. *Lingotopia*, a language learning 3D adventure

- Exploration is a well-established mechanic for revealing more about the game world or gaining gameplay advantages
- Using images for representation affords more contextual cues than symbols
- Visual representations should be representational enough to carry contextual cues
- The technology used should be sufficiently sophisticated to afford recognizable multimodal representations (i.e. using ASCII for graphics or MIDI for sound might not be expressive enough)
- There is no discernible difference between the contextual carrying ability of 2D and 3D imagery for the most part

4.3 BENCHMARKING LANGUAGE LEARNING GAMES AND APPLICATIONS

I benchmarked narrative-based language learning games and applications on how they afford contextualized language use and goal-oriented learning (see Table 2). The benchmarked games and apps include *Lingotopia*, a 3D exploration-based adventure game; *Koe*, a Japanese style RPG, or JRPG; *Influent*, an immersive 3D environment; and *Duolingo Stories*, a dialogue-based learning exercise.

4.3.1 Contextualized language use

Duolingo Stories contextualizes language with stories, told primarily through dialogues between two people in the target language.

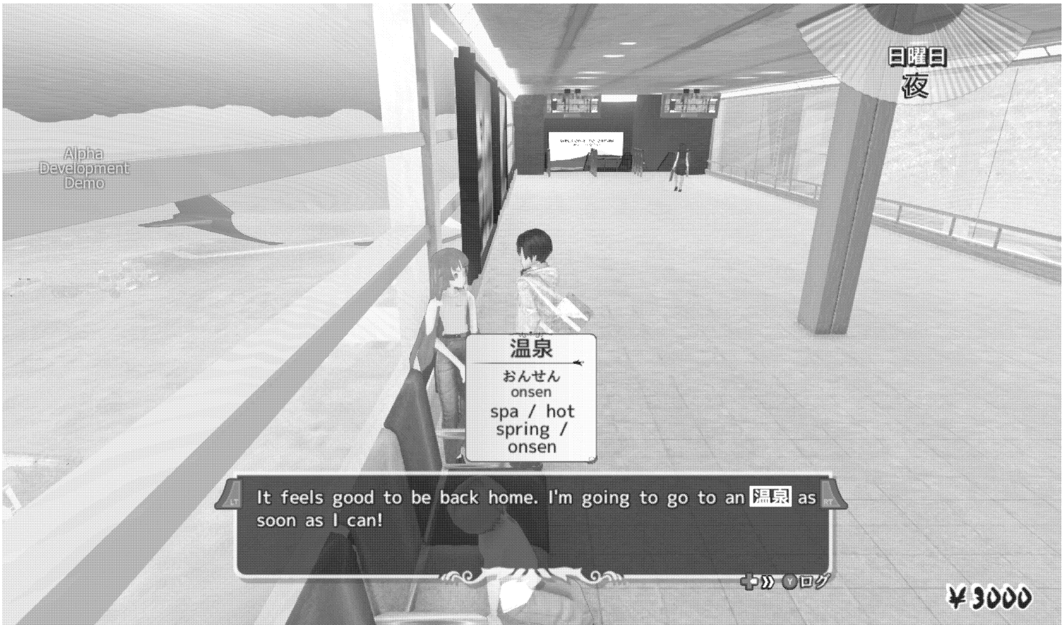
Multimodalities include text, voice and sometimes image. Learning prompts are interspersed with the dialogue to assess learner comprehension. *Duolingo Stories* is a kind of gamified exercise application where you get points for answering the comprehension questions correctly and "level up" as you finish stories on a particular tier. For the most part, the stories are not related to each other, so there is no overarching fictional world, main character or other narrative elements. *Duolingo Stories* follows an academic GT approach to teaching.

Influent is an immersive 3D learning environment where the player-learner moves an avatar around an apartment and tries to find objects corresponding to words. Language is contextualized through spatial cues, 3D image representations, spoken form, and associations between other words - e.g. the 3D object signifying bed is associated with the noun 'bed' and the verb 'to sleep'.

In *Lingotopia*, the narrative setup has the player-learner character stranded on a strange island where everyone speaks the player-learner's targeted L2 language. The player-learner then explores the island, talks to the inhabitants and interprets L2 dialogue based on what can be inferred from symbols signifying the word (Fig. 9), and the player-learner's previous language knowledge.

While the premise of *Lingotopia* is interesting and well-intentioned, the design is not without its shortcomings. *Lingotopia* aims to accommodate the learning of multiple languages with the same designed narrative. This means that the visual representations can't include any references to specific L2 cultures, which effectively removes all cultural

Fig. 10. *Koe*, a Japanese-style RPG for language learning



It feels good to be back home. I'm going to go to an 温泉 as soon as I can!

contexts from the game (e.g. there probably won't be any Korean tteokbokki or Spanish paella). The visual representations of most objects in the game are stylized and simplified to the degree that makes it difficult to see what they are supposed to represent (consider the monocled "bird" character model and the plane and paw symbols in Fig. 9). The spoken dialogue is likewise stylized into a pseudo-language muttering that offers no support for language learning. Furthermore, the learning pace can be frustrating as the only way to encounter new vocabulary is to wander around in the game world. This sets high demands for the narrative and gameplay, as they have to be engaging enough to keep the player interested.

Koe also sets up a story of an outsider in a target language environment, in this case, an exchange student in Japan. This culturally situated premise provides a way to connect target language words into a cultural context (e.g. the game can use Shinto shrines as environments rather than generic temples).

New words in *Koe* are introduced with a comprehensible input approach where the bulk of the sentence is in the first language, and one word is in Japanese (Fig. 10). Dialogue is also situated in a context so that people in an airport have lines that are appropriate for the setting. Perhaps the main innovation of *Koe* is how the narrative contextualizes Japanese words as collectable combat spells and individual syllables as upgradable spell components. This creates a deep coupling of gameplay mechanics and language concepts, although it sometimes creates strange combinations (e.g. the word for book is considered a fire-based spell in the game world).

4.3.2 Goal oriented learning and feedback

In *Duolingo Stories*, the learner can choose which order they wish to complete the stories, but the stories themselves are linear and offer no choices to branch the narrative. Tasks in *Duolingo Stories* vary from answering multiple-choice questions, filling in the blanks, and pairing word-translation pairs. As such, a single story is a kind of gamified quiz designed to promote reading and listening comprehension. *Duolingo Stories* excels at giving corrective feedback with colourful, animated notifications and sounds, but offers no advice beyond that.

In *Influent*, the learner has much agency to wander around the room and find items, but the learning goal in this free mode is somewhat unclear. It can be inferred that the game affords learning of basic vocabulary related to household items. The learner can also enter special timed challenges where they must find the object that is associated with the given language form (e.g. for sleep, they must click on the bed). During the challenge, agency is very limited: only one answer is acceptable for a given word. Activity in *Influent* revolves around the same core gimmick, and it quickly gets tedious, trying to find vegetables in the same kitchen space. It is a cool mechanic, but not enough to engage player-learners for extended periods of time.

Essential learning experiences	Affordance (See section 3.3)	Potential mechanics and features
Narrative context in various settings	Contextualized language use	Designed narratives; sophisticated procedural generation of narratives; progressive designs;
Tasks and choices with meaningful consequences	Goal-oriented learning	Tasks, quests; dialogues with options; branching narratives
Feeling of progress and efficiency	Goal-oriented learning, feedback	Explicitly mentioned learning goals; feedback mechanisms; levels
Replayability, varied experiences	Goal-oriented learning, Space for sheltered practice	Levels and areas accessible based on skill; emergent narratives; variation in tasks, quests and dialogues; exploration
Effective contextual cues	Contextualized language use	Multimodal representations; form-meaning-use associations

Table 3. Updated ideas for mechanics and their related affordances, learning experiences and gameplay experiences.

Lingotopia gives a lot of player agency for the player-learner to move around and explore the game world and gives a general goal for the gameplay, but it is unclear what the learning goals are, as there is no list of available vocabulary. If the game does not afford learning goals, there can be no learner agency. *Koe* suffers from similar problems: firstly, the gameplay requires the player-learner to wander around in an expansive environment. Secondly, the game lacks discernible learning goals; words are introduced seemingly at random, and there does not appear to be an easy way to study much school-related vocabulary, for instance. Furthermore, *Koe* is advertised as a communicative language learning approach[12] to DGBLL, but actual language use is quite limited (at least during the first two hours of gameplay). In fact, the only situation for the player-learner to use the target language is in combat, and even then, usage is primarily based on their meaning within the fictional narrative. For example, it is unclear how casting a book spell on a game opponent transfers to practical competence of using the word book in the real world.

In the end, while *Duolingo Stories* uses purportedly outdated academic and GT methods, it outclasses the other language learning games and environments I benchmarked by providing enjoyable content, clear, succinct feedback and an unmistakable feeling of progress.

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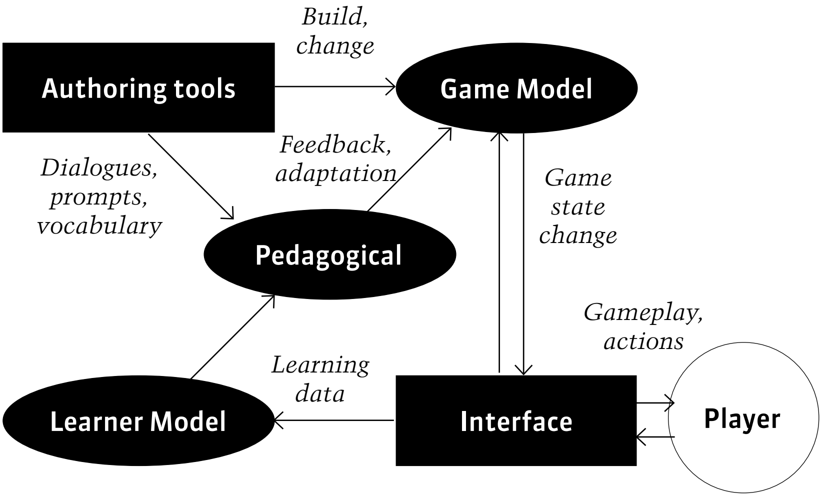
[12] https://www.koegame.net/ referenced on 14.10.2019

Fig. 11. The proposed game architecture.


Build, change
Authoring tools
Game Model
Dialogues, prompts, vocabulary
Feedback, adaptation
Game state change
Pedagogical
Gameplay, actions
Learning data
Learner Model
Interface
Player

4.3.3 *Takeaways*

Key takeaways from benchmarking language learning game affordances include the following:

- Visual representations and contextual cues should be clear and understandable
- The goal-oriented activities should have some variety
- Learner goals should be made explicit so that the game clearly affords learning
- Gameplay and learning should be balanced; too much gameplay and learning feels inefficient, too much learning and it gets tedious
- If targeting a single language, the game can contain contextual cues that target the culture associated with that culture
- Language use within the fictional narrative should be transferable to other contexts
- It does not matter which SLA theory or approach the game is based on if it is not engaging enough to play or does not feel useful for learning

4.4 DESIGN GOALS

After informing my initial idea from section 4.1 with the benchmarking in sections 4.2 and 4.3, I arrived with this updated table of learning experiences, affordances and mechanics (Table 3).

After this, the game idea on the level of mechanics was updated to have the player-learner encounter and complete a wide variety of dialogue-based tasks and quests, where choices carry meaningful consequences (at least within the confines of the gameplay). Learning goals would be made explicit or at least discernible, and mindless wandering in the game world would be substituted with goal-oriented exploration or efficient language learning activities. The design goals were thus defined:

- The game must have a narrative that sufficiently contextualizes both a variety of contextual language use situations and the game mechanics
- The game must include a wide variety of tasks and quests involving, e.g., dialogue and exploration
- Choices eventually lead to meaningful consequences (within the confines of gameplay)
- The game should afford goal-oriented learning and learning goals should be readily discernible during the first few minutes of gameplay
- The game should balance narrative exploration with efficient language learning activities

4.5 PROPOSED ARCHITECTURE

Based on the design goals, initial ideas and constraints, I described what this kind of game would look like in terms of the underlying technology and architecture, the gameplay mechanics, story and aesthetics, following Schell's definitions (2008; see section 2.2.2).

4.5.1 *Architecture and underlying technology*

Based on the models reviewed in section 3.4.2 (Maragos & Grigoriadou, 2005; Hwang et al. 2017; Culley et al. 1986; Hodhod, 2010), I devised a general architectural model for this narrative-based language learning game.

On an architectural level, the proposed language learning game system consists of four main parts: the **game model**, the **pedagogical model**, the **learner model**, and the **player-learner interface**. The game model oversees the state of the game and player, while the pedagogical model houses the instructional domain objectives, narratives and vocabulary. The learner model stores the player-learner's current knowledge of the instructional domain, and the player-learner interface contains functions and interactive components that handle input and output between the player-learner and the game system. Additionally, an **authoring tool** module is used to input data such as dialogues, prompts and vocabulary into the pedagogical model (Fig. 11).

I scoped the development of the learner and pedagogical models as well as the authoring tools outside of the thesis, as they are more related to adaptation and scaffolding. In order to explore my main focus on narratives, agency and contextualization, I considered the player-learner interface and some preliminary data structures as sufficient.

The player-learner interface prototype is envisioned in 2D graphics as opposed to 3D or text-based graphics, for a few reasons. Firstly, multimodal representations require more than text-based visualization. Secondly, 3D graphics are still prohibitively time-consuming and costly[13] to produce in a sufficiently robust way, even though they might be more immersive than 2D. Thirdly, complicated interface designs and mechanics required by most 3D games easily raise the learning curve which has been shown to be a hindrance in learning contexts. Finally, on a more practical level, my expertise is in 2D illustration and interface design, so this choice will allow me to get results faster.

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[13] e.g. https://meliorgames.com/game-development/2d-vs-3d-games-differences-benefits-and-costs/

4.5.2 Fictional world and narrative

Coming up with a suitable narrative for the game prototype proved an unexpected challenge. As stated in section 2.1.3, practical language use in Korean is heavily context-dependent. This means that acquiring broad knowledge about appropriate language use in different contexts requires varying the situational context. One of the design goals of the game was to allow the player-learner to assume different roles in varying contexts without breaking narrative coherence. So the same player-learner should be able to play dialogues from the perspective of a female student in high school, or the perspective of a middle-aged male police officer. I could not have the player-learner switch jobs because that would not account for the age and gender differences. The narrative would also need to account for the fact that the player-learner's native Korean police officer avatar suddenly does not speak Korean fluently.

I eventually settled on a form of body-switching or possession narrative, using shapeshifters[14] that pretend to be Korean people for some nefarious reason. The shapeshifter narrative solves the problems above and some others:

- **Multiple contexts**: the shapeshifter can readily assume the form of a little girl or an elderly man
- **Poor language skill**: the shapeshifters do not speak Korean, but must learn it to fit in
- **Punishing mistakes**: making language and cultural gaffes when impersonating a person in a position of authority raises suspicion that can further contextualized game mechanics
- **Authenticating basic tasks**: the otherness of the shapeshifters' perspective affords framing trivial and mundane tasks like getting a cup of coffee as special

The narrative further presents the potential to contextualize various game elements and mechanics:

- **Streaks**: you have to come back every day, or you will get caught (the objective is to evade capture for 30 days)
- **Shifting vocabulary**: you have to switch bodies and professions to evade capture; sometimes you are a professor, other days you are a student
- **Scaffolding difficulty**: you can pretend to be an exchange student or a child, making mistakes more forgiving, or an adult in a serious profession, making mistakes more punishing

[14] Shapeshifters feel culturally appropriate because Korean and East Asian folk lores are abound with shapeshifting creatures of all manners, for instance, the *kumiho* (구미호), a shapeshifting fox.

Setting up the shapeshifter as an anti-hero affords a clear character development arc that can make the narrative more engaging. The fictional world is designed to be just enough to create a thematically coherent experience that does not pose too many constraints and affords a wide variety of content for conversational dialogues, which are a crucial component of the game's mechanics.

4.5.3 *Mechanics and gameplay*

The main gameplay mechanic and goal of The Impostor is completing **missions** by gathering information through eavesdropping on and having conversational **dialogues**. Conversations range from short greetings in the beginning and move on to more complex ones as the player-learner's language skill progresses. The goal of the game is to complete all the core missions, corresponding to a unit of language learning curriculum. I initially considered making frequent deaths from grammar errors a central part of the game, but after reviewing the benchmarking findings on roguelike mechanics (see section 4.2.2), it felt counterproductive to punish players for experimenting with language.

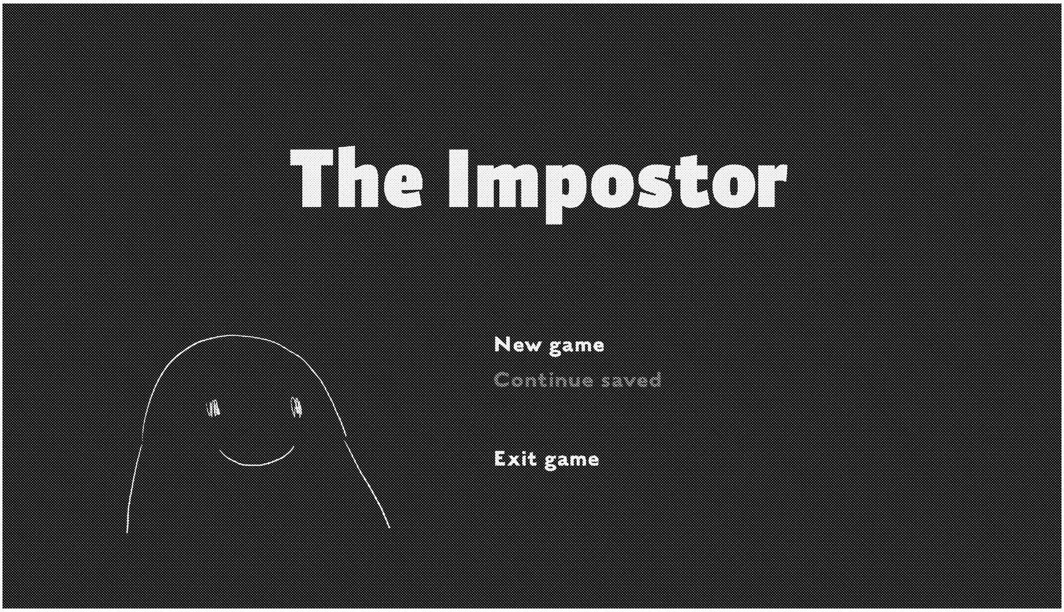
The other key gameplay mechanic is managing **suspicion**. Suspicion represents the mistrust the character has accrued. Making grammar mistakes, going to locations your human form should not go, asking outlandish questions or behaving otherwise strangely will garner suspicion. Consistent streaks of correct answers and general avoidance of suspicious activity gradually alleviate suspicion. Excessive suspicion leads to the player character being exposed, failing any active missions and getting kicked out of their current form, which is then permanently lost. The player will then have to start over with another human form (which can be the same type of human, just a different instance).

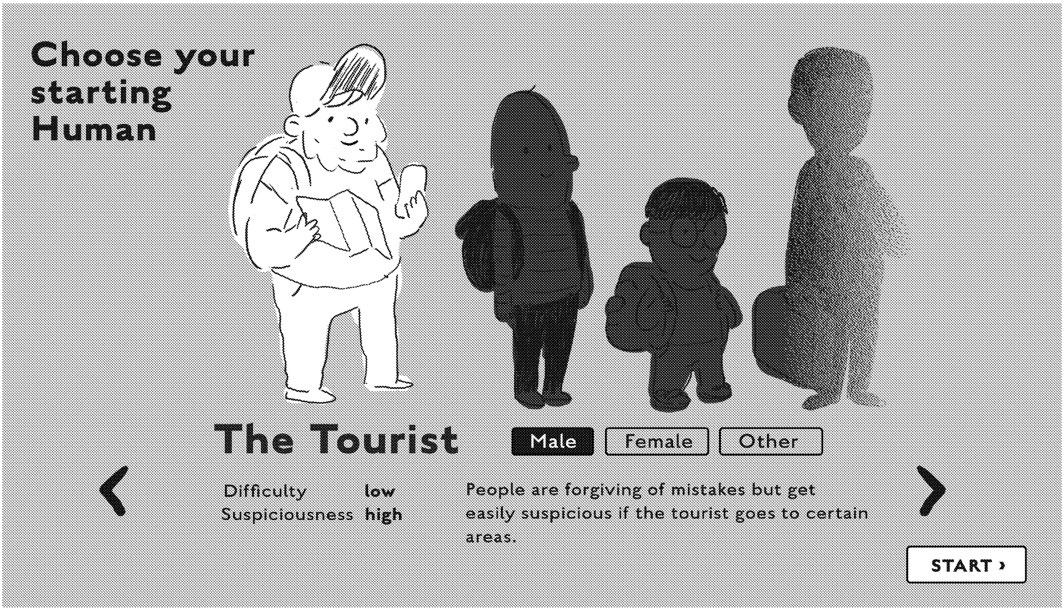
Dialogues are used as vessels of language content. In the case of conversations the player-learner takes active part in (as opposed to eavesdropping), they first need to declare their intent (e.g. *"greet"*, *"ask for the menu"*, or *"excuse yourself and leave"*) before moving on to target language use. This is to circumvent the intent classification problem mentioned in section 3.3.2.

4.5.4 *Aesthetics*

As alluded to in section 3.2.1, the game uses 2D graphics with a top-down isometric map view and illustrated dialogue views similar to JRPG dialogue screens. At the moment, the game is still in a playtesting stage, and the final aesthetics will be decided later. For the time being, the aesthetics are constrained in that the multimodal representations must be recognizable enough that they can carry contextual cues about vocabulary, i.e. images should not be too abstract or stylized so as to distort their meaning.

Fig. 12. Prototype title screen


The Impostor
New game
Continue saved
Exit game


Choose your starting Human
The Tourist
Male
Female
Other
START ›

Difficulty low
Suspiciousness high

People are forgiving of mistakes but get easily suspicious if the tourist goes to certain areas.

Fig. 13. Human form selection screen

5

RESULT: THE IMPOSTOR

5.1 INTERFACE MOCKUPS

After the **title screen** (Fig. 12), the game begins with a succinct set up in the manner of *Faster than Light*:

> *Congratulations, Agent. You have been selected to gather knowledge from the humans. Assume their form, win their trust and steal their secrets. Our day will come.*

Following the narrative setup, the player-learner enters the **form selection view** (Fig. 13) and selects a human form to assume for the next mission. The player chooses a gender and an occupation such as a tourist, an exchange student, a schoolkid, an office worker, and so on. The tourist is a special tutorial-type starter form that is more forgiving of language mistakes but has restricted access to different areas. Later on, the choice of form controls the content available during the missions, e.g. an office worker can go to an office while a schoolkid can to go to elementary school without arousing suspicion. As new human forms are

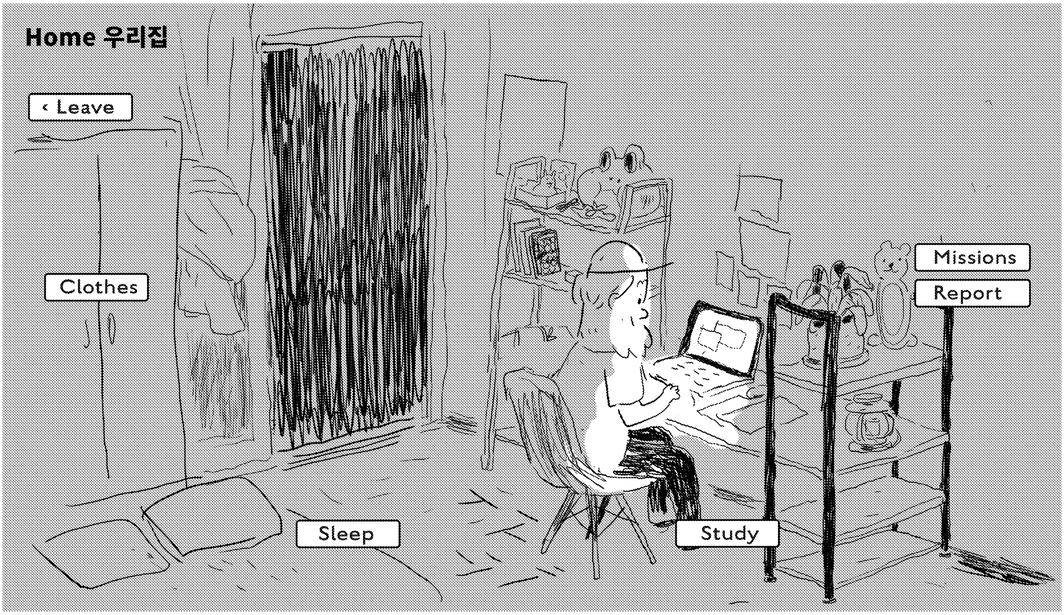
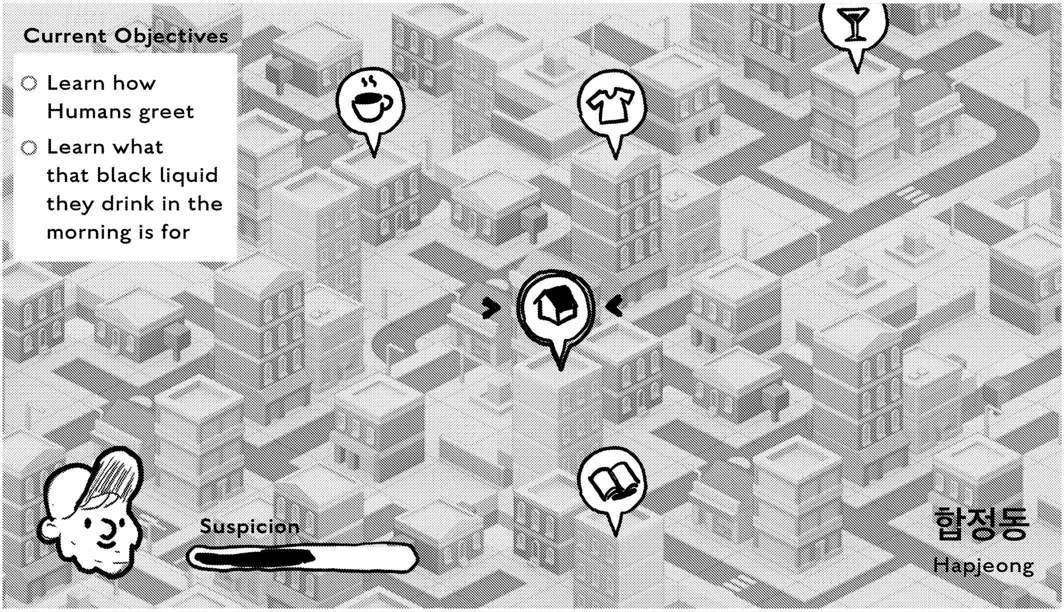


Fig. 14. Home view for the Tourist character



Current Objectives

○ Learn how Humans greet

○ Learn what that black liquid they drink in the morning is for

Fig. 15. Map view

unlocked, the player can abandon their current form and return to the form selection.

After choosing an initial human form, the player lands in their **home location** in the city (Fig. 14). At home, the player may receive and accept **core missions**, submit **reports** on completed missions, change clothing, sleep, and **study Korean** through grammar-translation minigames. These minigames are included to satisfy the requirement of including academic, grammar-translation and audio-lingual style linguistic competence practice interleaved within the more pragmatic competence focused narrative practice. Once the player-learner gathers enough information to complete a core mission or set of missions, they can report the secrets back to headquarters through their home location. In order to successfully finish a mission, the player-learner needs to complete a debriefing report dialogue, which doubles as a comprehension quiz (Fig. 24).

Leaving the home location leads to the **map view** (Fig. 15). The map consists of locations the player can visit, such as cafés, neighbour's houses, restaurants, bars, shops, museums et cetera. The player receives some initial core missions that they wish to complete, such as *"Learn how Humans greet"* or *"Learn what that mysterious black liquid Humans ingest during the early part of the day is"*. Clicking on the mission names reveals the language learning objectives behind each mission.

At **locations**, the player can gather information related to their current mission by **eavesdropping** or having **conversations** (Fig. 16). Eavesdropping is information snooping that doubles as listening and reading comprehension practice. Conversations are fully voiced language use exercises that allow the player-learner to purchase goods, food and drinks within the fictional world and also find out information. Sometimes,

[15] Core missions are special tasks that correspond to key learning objectives and advance the main plotline.

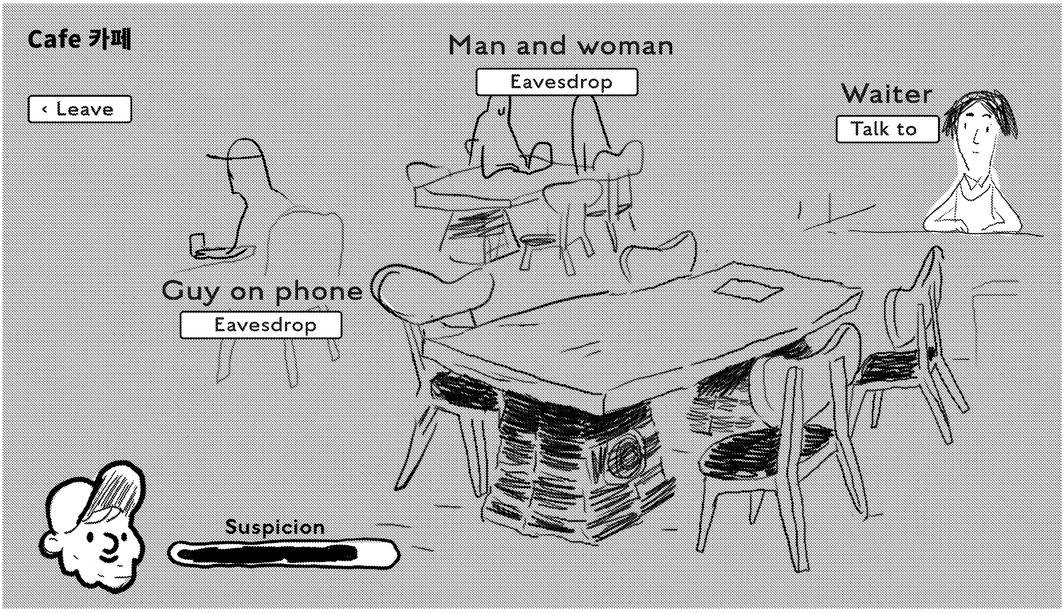
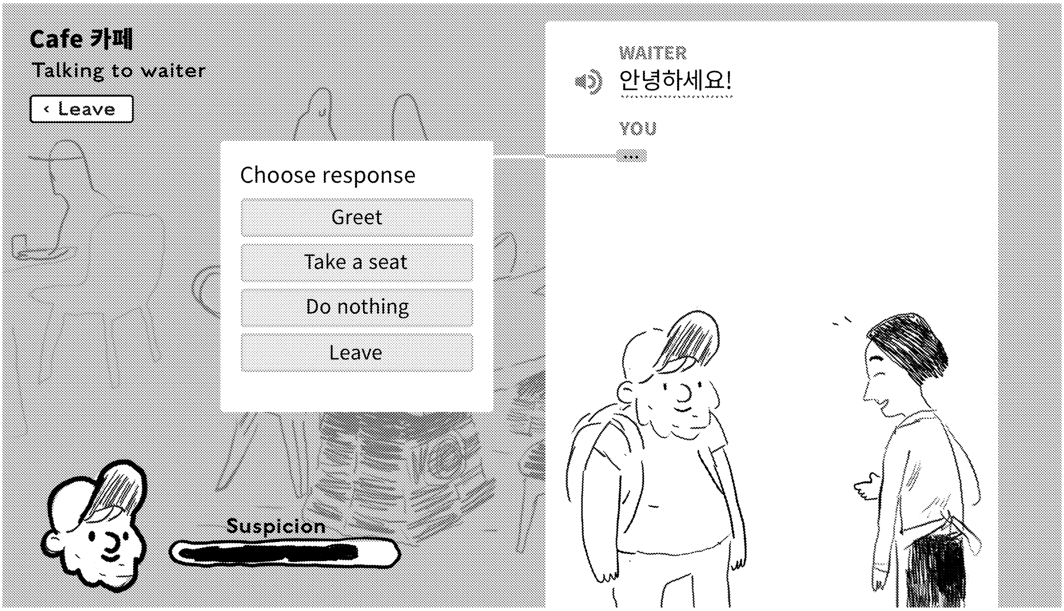

Cafe 카페
‹ Leave
Man and woman
Eavesdrop
Waiter
Talk to
Guy on phone
Eavesdrop
Suspicion

Fig. 16. Cafe interior with choices to **eavesdrop**, **talk to the waiter** or **leave**.

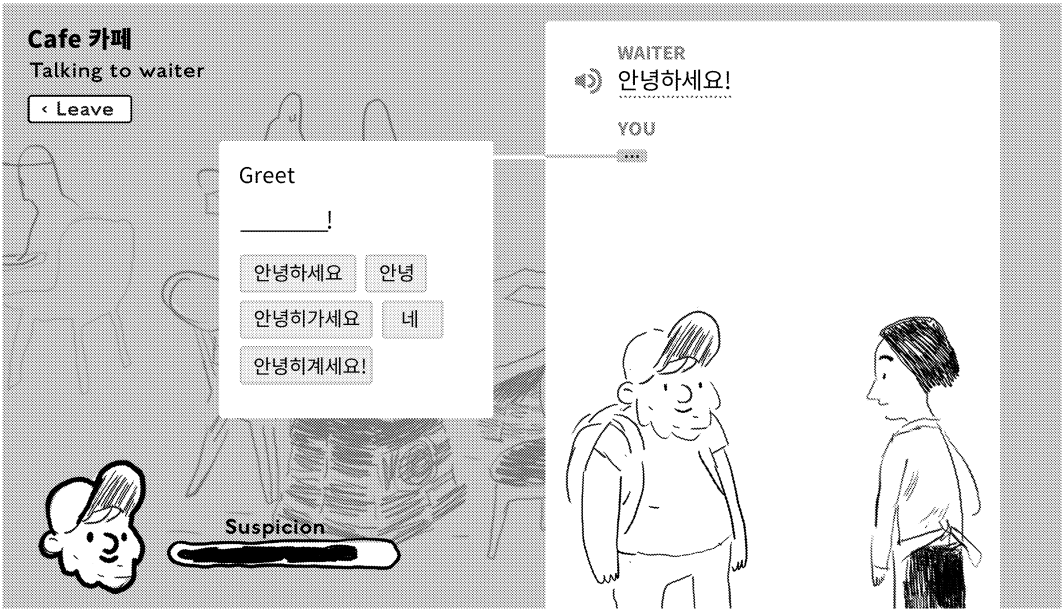
Fig. 17. Entering into a dialogue with a waiter, the dialogue system prompts the player-learner for **intent** in English.


Cafe 카페
Talking to waiter
‹ Leave
Choose response
Greet
Take a seat
Do nothing
Leave
Suspicion

WAITER
안녕하세요!

YOU
...

Fig. 18. Choosing an answer to match the *greet* intent in this context.

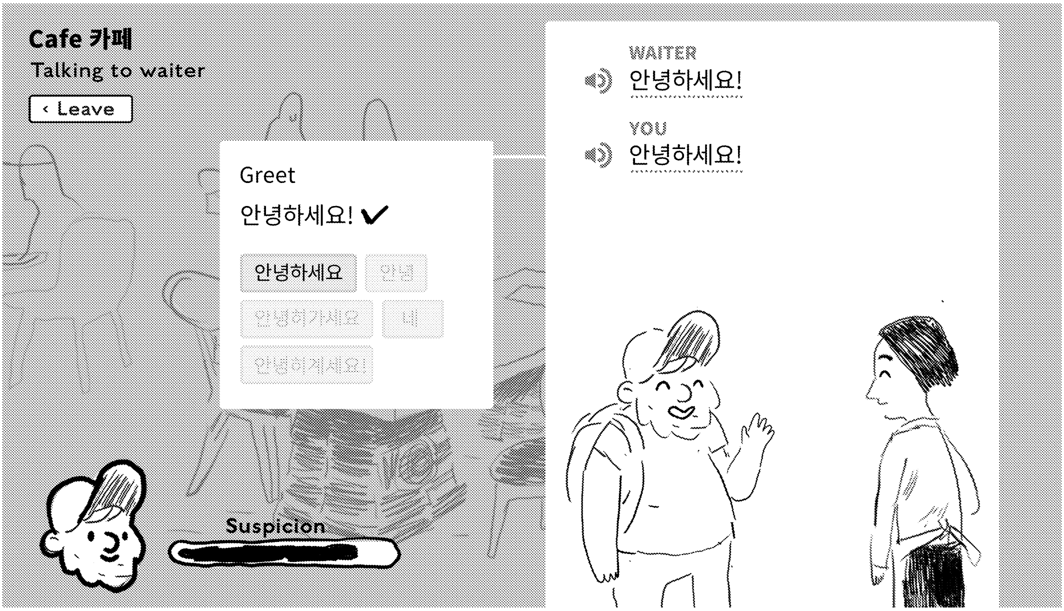

Cafe 카페
Talking to waiter
‹ Leave
Greet
安녕하세요
안녕
안녕히가세요
네
안녕히계세요!
Suspicion

Greet

________!

WAITER
안녕하세요!

YOU
...


Cafe 카페
Talking to waiter
‹ Leave
Greet
안녕하세요
안녕
안녕히가세요
네
안녕히계세요!
Suspicion

Greet

안녕하세요! ✓

WAITER
안녕하세요!

YOU
안녕하세요!

Fig. 19. The correct response showing politeness.

eavesdropping and conversations lead to side missions, which are smaller tasks that have smaller rewards.

As an example, a mission might entail learning three facts about coffee (in Korean). To find out about it, the player can go to a café, order a cup and ask various questions about it (*"Where did this coffee come from?"*, or *"How much does the coffee cost?"*). They can also eavesdrop on conversations people are having in the coffee shop and find out more (e.g. *"Oh! This coffee is delicious!"*).

When having a conversation, the player-learner is first prompted for a response intent in English. Then the player-learner is prompted for a contextually appropriate Korean sentence that corresponds that intent (Fig. 18–Fig. 20). These sentence prompts are multiple-choice fill-in-the-blanks exercises at the lower language skill levels and evolve to free form typing and complete sentence formation in the higher levels[16]. Suspicion is raised when the player-learner makes a grammatical or contextual mistake (e.g. using the wrong formal tense). During eavesdropping (Fig. 21) on others, the view is similar to the conversation view, but the prompts deal with the content of the others' dialogue with questions similar to *Duolingo Stories*. If the suspicion bar fills up, the player gets caught (Fig. 23) and has to move back to the form selection screen.

As core missions are completed and the player-learner's language skill develops, further missions and Human forms are unlocked. The game proper eventually ends when all core missions have been successfully

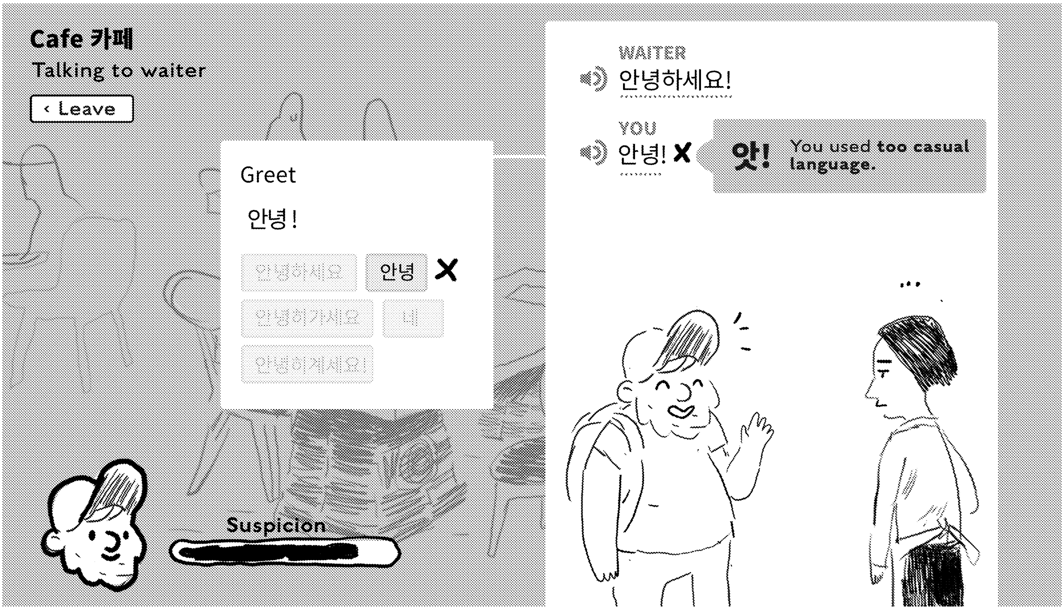


Fig. 20. An incorrect, overly casual response elicits feedback.

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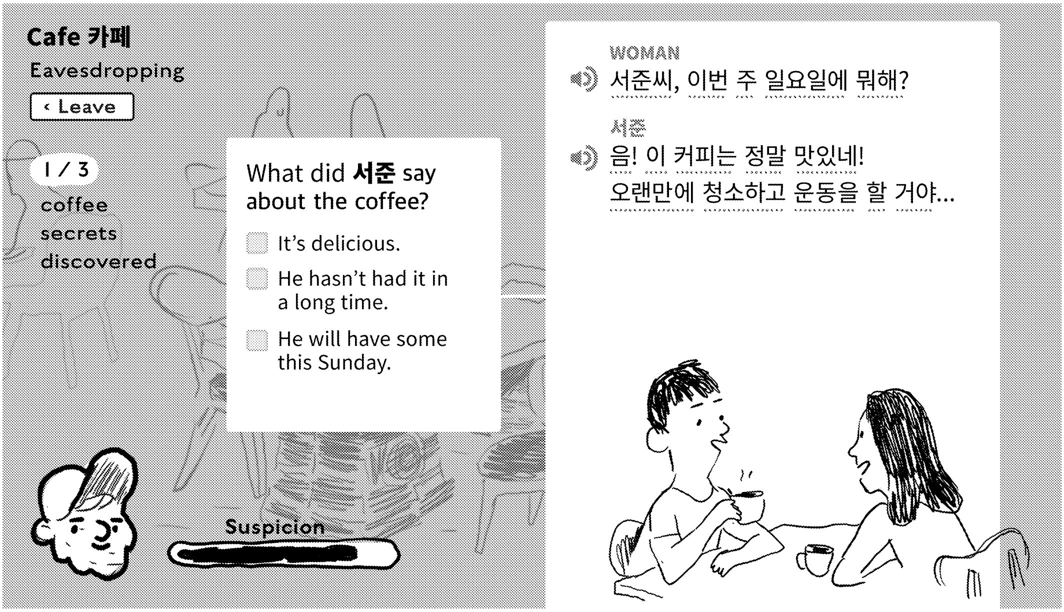
[16] This follows the second approach for scaffolding of both gameplay and language challenges suggested by Reinhardt (2018), see section 3.3.3.


Cafe 카페
Eavesdropping
‹ Leave
1 / 3 coffee secrets discovered
Suspicion

What did **서준** say about the coffee?

☐ It's delicious.

☐ He hasn't had it in a long time.

☐ He will have some this Sunday.

WOMAN

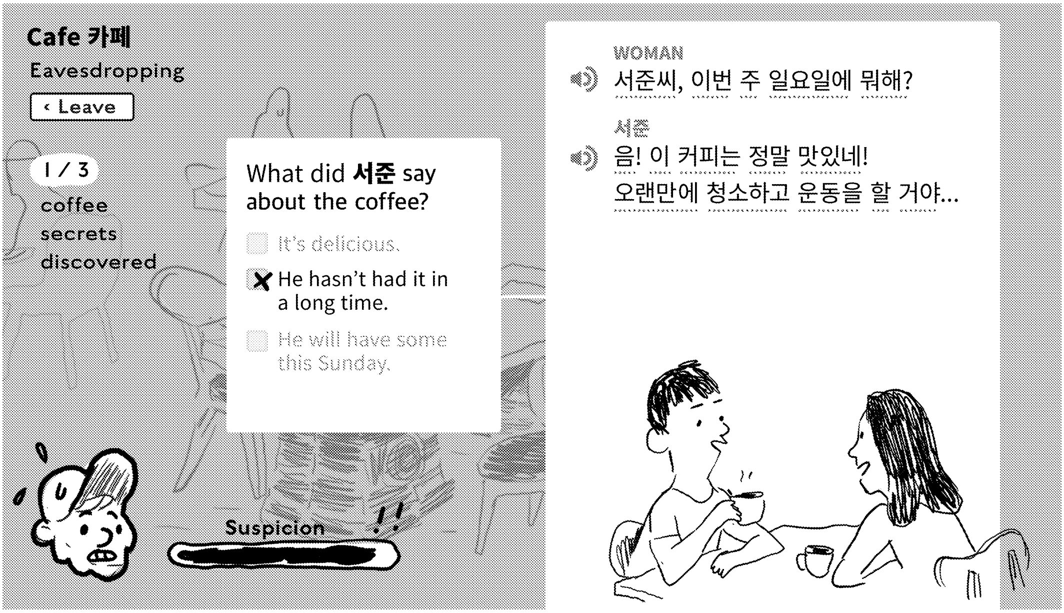
서준씨, 이번 주 일요일에 뭐해?

서준

음! 이 커피는 정말 맛있네!
오랜만에 청소하고 운동을 할 거야...

Fig. 21. Eavesdropping to find out "coffee secrets". The dialogue system tests for listening and reading comprehension.

Fig. 22. Whoops! Wrong answer. The suspicion meter goes up.


Cafe 카페
Eavesdropping
‹ Leave
1 / 3 coffee secrets discovered
Suspicion
!!

What did **서준** say about the coffee?

☐ It's delicious.

☒ He hasn't had it in a long time.

☐ He will have some this Sunday.

WOMAN

서준씨, 이번 주 일요일에 뭐해?

서준

음! 이 커피는 정말 맛있네!
오랜만에 청소하고 운동을 할 거야...

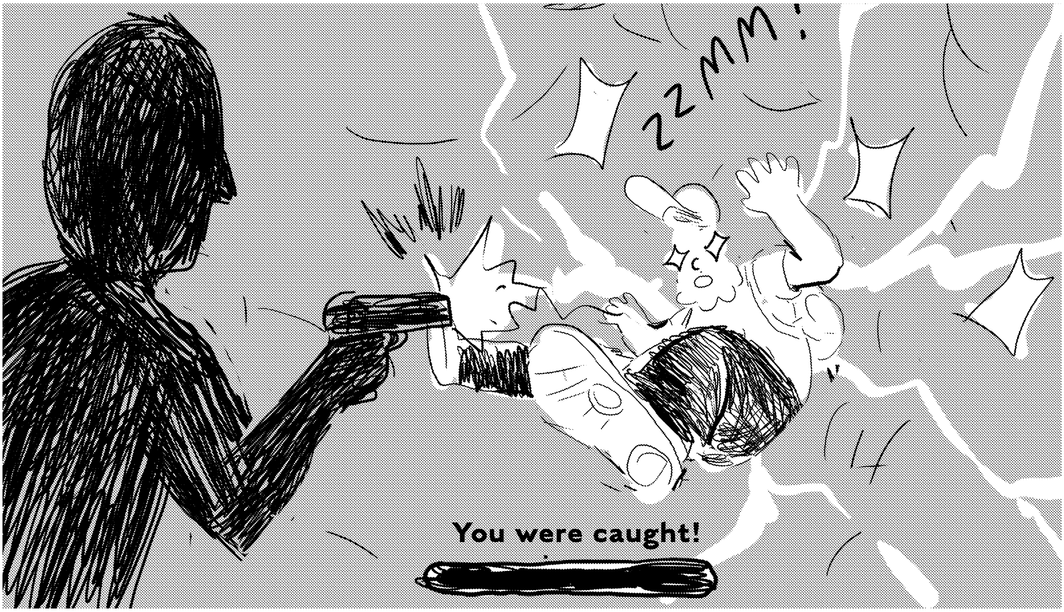
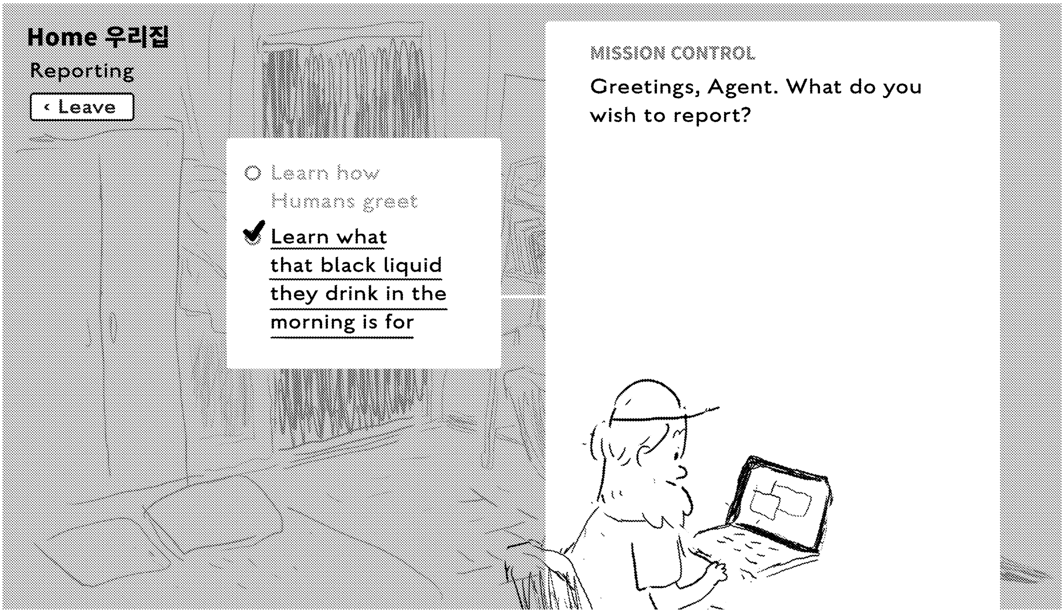

ZZMM!
You were caught!

Fig. 23. Busted by the shapeshifting police!

Fig. 24. View for mission debriefs and reports at home.



Home 우리집

Reporting

○ Learn how Humans greet

✓ Learn what that black liquid they drink in the morning is for

MISSION CONTROL

Greetings, Agent. What do you wish to report?

completed, but the player can keep exploring the city, replay previous core missions and complete side missions.

During gameplay, the implementations of the learner model and pedagogical model track the player-learner's input and store a history of the learner's correct and erroneous language inputs. These are used to infer the learner's language skills and to inform what level of task is appropriate. English translations of all Korean text in the game dialogues are shown by hovering over the text, and the dialogue line voice playbacks can be repeated by clicking on a speaker icon next to them. The user interface language can also be switched to Korean, but it is initially set to English.

5.2 TECHNOLOGY

To exploit my existing expertise in web technologies, I implemented a prototype using JavaScript (JS) libraries and frameworks such as Node.js, KoalaNLP for Korean natural language processing, and ReactJS. The aim of doing a prototype like this is to test more sophisticated input methods than a normal user interface mockup affords, e.g. freeform keyboard input.

As the project is still in a very preliminary stage, the code implementation is quite rudimentary. However, on a high level, it can be divided into two parts: the backend, representing the pedagogical model, game model and learner model, and the frontend viewer, representing the player-learner interface (see section 4.5). I also devised a frontend builder interface representing the authoring tools but abandoned development on that until more playtesting is completed, as it will affect the viable data structures and thus the functions of the authoring tools.

In its current form, the backend component transmits a JSON object containing a dummy interactive dialogue tree to the frontend viewer, which then creates a textual representation of the dialogue and manages the game session state (e.g. which part of the narrative to show).

The prototype source code is available from a public *GitHub* repository at https://github.com/tomengstrom/hanjagame

6

DISCUSSION AND REFLECTION

The interface prototype proposed in this thesis offers a combination of game mechanics and contextual language teaching methods that are grounded in ecological SLA theory, which is relatively novel in the sphere of DGBLL. Established applications such as *Duolingo* and *Memrise* are using academic style grammar-translation methods for drilling vocabulary, and more experimental initiatives such as *Influent*, *Koe* and *Lingotopia* are primarily focused on immersive exploration and vocabulary acquisition methods grounded in psycho-cognitive SLA theory. While the prototype is still lacking in technological functionality and in need of proper playtesting, I argue that the main ideas expressed through the interface mockup are fundamentally and theoretically solid and fulfil the design goals outlined in section 4.4. They are also technologically feasible, although whether or not the game is worth making in its current form remains to be validated.

However, the proposed game has some readily identifiable shortcomings. Notably, the proposed game caters to player-learners who are dispositioned to using exploration and dialogues in learning. Therefore, it will not appeal to all learners, even if they were gamefully dispositioned. Furthermore, the game does not afford social language use with other people (e.g. the game has no multi-player component), time and place independent learning (e.g. the interface proposal is not suited for mobile devices in its current form), and autonomous, extramural learning (e.g. doesn't necessarily teach language learning strategies or epistemic frameworks to further empower learners).

As indicated by the findings in Chapter 3, educational institutions and L2TL researchers seem to struggle to match teaching methods with the transformation of learner expectations in face of an increasingly mainstream video game culture. Perhaps this is why commercial apps such as *Duolingo* and *Babbel* are so popular because there are no similar solutions offered by formal sources. This runs the risk of regression in pedagogical practices if the game and app designers coming from outside of SLA research-informed fields base their design on limited understanding or obsolete theories, another reason to encourage cross-disciplinary collaboration between game designers and L2TL practitioners and researchers.

The subject of intelligent and adaptive tutoring systems was mentioned intermittently in the thesis. Systems like these involve learner models and learner data, similar to the user data that *Facebook* or *Google* operate. Commercial language learning game companies such as *Duolingo*, *Memrise* or *Babbel* already gather masses of data like this privately to improve their algorithms and businesses. However, if this type of data was shareable in a standardized format, all games, applications, and other learning environments could benefit. It would also afford individual games and applications to specialize in a narrower field of instruction.

When I first started this thesis in 2017, my motivation was to create a language learning game centred on task-based learning and learning experiences, rather than the prevailing grammar-translation applied by most mobile language learning applications at the time. As I had very vague notions about game design, SLA theory and L2TL practices, I spent a great deal of time only prototyping games using natural language processing libraries and word lists, mostly based on grammar-translation approaches. This messy process produced some interesting prototypes, but as they were uninformed by either SLA or game design theory, they were ultimately unsatisfying.

Familiarizing myself with the theoretical underpinnings of digital game-based language learning has been an unexpectedly large hurdle and brought to question many of my initial assumptions about language learning game design. The impetus for this thesis, namely the disappointment in existing digital language learning applications, has remained a key motivator throughout the process, but now I have a different level of appreciation for the difficulty involved in game design, L2TL practices, and digital language learning game design and development. My high ambitions at the onset of this process have been somewhat tempered, and the initial goals of actually finishing and launching a playable game turned out to be a fantasy. In retrospect, I would contend with finishing one of the simpler, smaller games I prototyped earlier, rather than trying to create the holistic approach represented in the proposed design. Alternatively, focusing on simply mapping out different ways to approach language contextualization in digital language learning games could have been a more straightforward focus. But overall, I'm satisfied with the outcome and my ability to weave through the many challenges throughout the process.

7

CONCLUDING REMARKS

In this chapter, I present thoughts on the thesis findings and recommendations based on the findings and my experiences.

This thesis presents a systematic, theory-based approach to the design of narrative-base games. The result of this thesis shows that a game design that is grounded in socio-cultural and ecological perspectives of SLA theory can afford goal-based and contextualized language learning of Korean. The design process taken in the thesis further illustrates a widely reported observation that DGBLL game development is a laborious undertaking and requires a broad understanding of all the related fields. To reiterate a commonly expressed thought, DGBLL should not be considered the best approach to all language learning situations, as less resource-intensive and effective approaches are often available in a given context.

Further findings include reminders of the nature of digital language learning games. Good learning game design differs from "regular" game design in that it has to account for the educational aspect as well as the fun and interesting aspect. Many language learning games that are mentioned in this thesis focus on fun and immersion at the expense of efficient learning. Thus a key activity in DGBLL design is identifying the targeted learning objectives, learning experiences and game experiences. It's perfectly acceptable to create a grammar-translation game with limited contextualization as long as those limitations are recognized.

Because of the multifaceted nature of DGBLL theory and practice, it is a good starting point to approach DGBLL game design and development systematically. In order to streamline the process, it is crucial to decide early on which SLA theories and teaching styles should be followed, because they affect the game design on a fundamental level. For instance, a grammar-translation approach can be combined with almost any game type, but more communicative teaching methods require the game to accommodate contextualization or communication activities.

As in every aspect of design, it is important for a DGBLL game designer to understand the problem space sufficiently before starting actual design work. In DGBLL design, a designer ought to develop and nurture sensibility in both the L2TL and game design. It's a good idea to connect with language teaching experts who are positively dispositioned to DGBLL to verify and develop the pedagogical soundness of designs. A possible reason for an apparent dearth of high quality game-based language learning designs is that there are few designers or design teams that have acquired sufficient multidisciplinary insight.

8

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APPENDIX I - TERMS

Authenticity refers to the genuineness, realness or naturalness of a learning resource. A learner may perceive a resource as authentic even though it isn't, and vice versa. In many learning contexts, the learner-player's subjective perception of authenticity is more important than whether or not the resource is inherently authentic. (Sykes & Reinhardt, pp. 25, 135)

Decision tree a tree diagram used to represent the various stages of a decision-making process, typically with each node representing a decision or question and each branch representing a possible consequence or answer resulting from the previous node. (Oxford University Press, 2019)

Digital game-based language learning (DGBLL) an umbrella term encompassing use of vernacular games, synthetic immersive environments, educational games, gamified applications, interactive fiction as well as the attendant discourses and activities surrounding games in L2TL contexts (Blume, 2019).

Foreign language another language learned in a country where it is not an official language. For example, English as a Foreign Language (EFL) could be studied in Korea (Reinhardt & Sykes, 2013). See also second language.

L1 is a language user's first language. **L2** is a language user's second or foreign language (Cook, 2013).

Linguistic competence the knowledge and ability to connect individual grammatical forms with meaning and appropriate use in sentence structures (Larsen-Freeman, 2001). See also pragmatic competence.

Natural language processing is the application of computational techniques to the analysis and synthesis of natural language and speech (Oxford University Press, 2019).

Pragmatic competence the ability to use language in a given context, either externally to communicate with others or internally, to organize thoughts and plan ahead (Cook, 2013). See also linguistic competence.

Second language another language learned in a country where it is an official language. For example, English as a Second Language (ESL) could be studied in the United States. SL learners typically benefit from immersion and exposure to the target language on a daily basis (Reinhardt & Sykes, 2013). See also foreign language.

Target language the language that is being studied (Cook, 2013)

Utterance a spoken word, statement, or vocal sound (Oxford University Press, 2019).

APPENDIX II - LIST OF GAMES AND APPLICATIONS MENTIONED

Title	Developer	Publisher	Date of First Release
Duolingo	Duolingo Inc.	n/a	2011
Baldur's Gate	Bioware Black Isle Studios	Interplay Entertainment	1998
Brogue	Brian Walker	Brian Walker	2015
Catch It! Korean	CatchItPlay, Inc	CatchItPlay, Inc	2019
Civilization	MPS Labs	MicroProse	1991
Eggbun Korean	Eggbun EducationCo., Ltd	Eggbun Education Co., Ltd	2016
Faster than Light	Subset Games	Subset Games	2012
Grim Fandango	LucasArts	LucasArts	1998
Influent	Rob Howland	Three Flip Studios	2014
Koe	Strawberry Games	Strawberry Games	pre-release
Korean Dungeo	Terry Young Studio	Terry Young Studio	2017
Lingotopia	Lingo Ludo	Lingo Ludo	2018
Math Blaster	Davidson & Associates	Davidson & Associates	1983
Memrise	Memrise	Memrise	2010
Monopoly	Lizzie Magie Charles Darrow	Parker Brothers	1934
Pillars of Eternity	Obsidian Entertainment	Paradox Interactive	2015
RPG Maker	Degica	Degica	1992
Sejong Hangugeo (세종한국어)	Sejong Hakdang Foundation	Sejong Hakdang Foundation	2018
Slay the Spire	Mega Crit Games	Mega Crit Games	2019
Space Quest	Sierra On-Line	Sierra On-Line	1986
State of Decay 2	Undead Labs	Microsoft Studios	2018
World of Warcraft	Blizzard Entertainment	Blizzard Entertainment	2004
X-COM 2	Firaxis Games	2K Games	2016