

Seeking out

FUN FAILURE

How positive failure feedback
could enhance the instructional effectiveness
of CALL mini-games

Frederik CORNILLIE & Piet DESMET



It is a piece of conventional wisdom that, in many areas of human cognitive development, controlled practice is required to eventually achieve full ability in a skill, such as practising scales in order to become a good player of jazz music.

<http://izquotes.com/quotes-pictures/quote-like-i-said-repetition-in-practice-and-hard-work-jerry-rice-153435.jpg>



**Like I said, repetition in practice and hard
work.**

(Jerry Rice)

izquotes.com

Musicians, sportsmen and -women, and the like, agree that with practice comes repetition, sweat, endurance, ...



... and - inevitably - failure. Cognitive science has strong empirical evidence for the model which predicts that repeated practice eventually results in spontaneous, automatized, and error-free performance. And this model has proven resilient through several paradigms of theorizing about human development (see Anderson et al., 2004).

Practice gets a raw deal in the field of applied linguistics.



Robert DeKeyser

Practice in a Second Language. Perspectives from Applied Linguistics and Cognitive Psychology (2007)

In the field of second language learning, however, the concept of practice often is not taken seriously. Sometimes it seems as if we have been *conditioned* to think about narrow behaviourist approaches to learning, such as mechanical drilling, when we hear the word 'practice'.

3 challenges for instructional design

This is not to deny that there are challenges. We have at least 3 nuts to crack.

The evidence is IN: drills are OUT

<http://barryabdahl.files.wordpress.com/2010/02/drill-kill.jpg>



Wong, W., & VanPatten, B. (2003). The Evidence is IN: Drills are OUT. *Foreign Language Annals*, 36(3), 403-423.

The first challenge concerns the nature of practice. We know that at least one type of drilling, namely mechanical drilling, simply isn't effective, and can even have adverse effects on language learning. Yet, there are other types of drills, and the challenge for instructional design is to make learners process language meaningfully while attending to linguistic form in controlled practice.

The key to the effectiveness [of practice] is
to design interesting drills
that are not demotivating.



Zoltán Dörnyei

The Psychology of Second Language Acquisition
(2009)

The second challenge concerns the effects of practice on learner motivation - controlled practice is often considered demotivating. As one possible solution, Zoltán Dörnyei suggests the use of CALL applications to keep drills interesting.

*Challenge
#3*



However, when drills are offered in CALL applications, feedback on failure becomes highly consistent and salient. According to perception theory, learners are likely to exaggerate such negative cues in memory, and as a result they may feel incompetent.

#1

make practice
meaningful

→ future work

#2

make practice
motivating

→ why bother?

#3

make failure
fun

However, why bother with motivation? Suppose that we could design non-mechanical drills that are effective in terms of cognitive learning outcomes, wouldn't that be sufficient ?

$$y = x^n$$

The answer is a firm no. We need to bother with motivation because there is such a thing as the power law of practice.

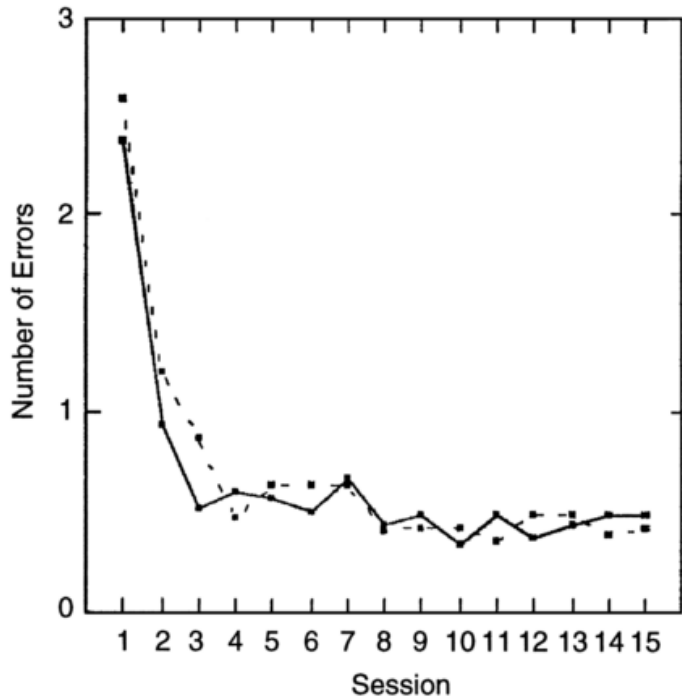


Figure 3. Number of errors in the comprehension task as a function of practice (solid line = single-task condition; dashed line = dual-task condition).

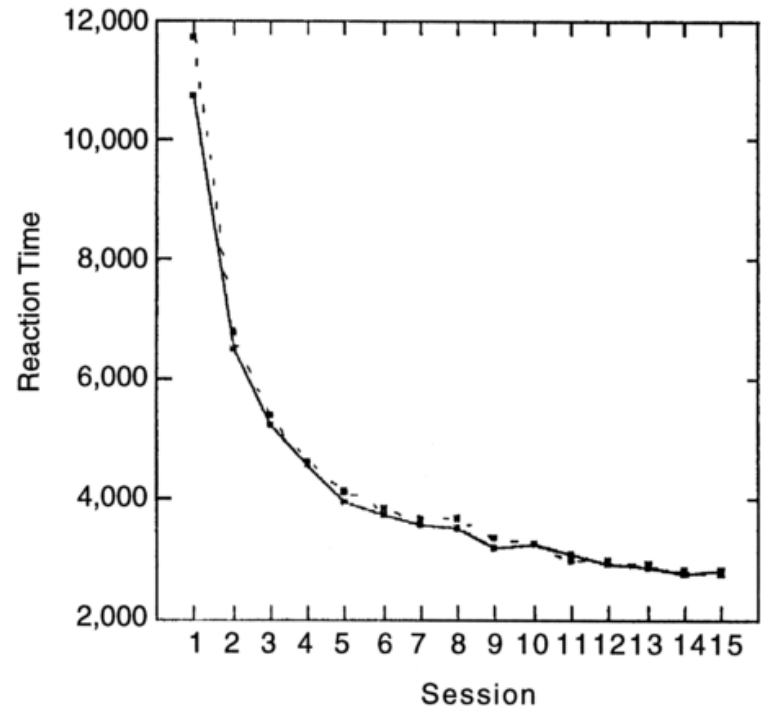


Figure 1. Reaction time (ms) in the comprehension task as a function of practice (solid line = single-task condition; dashed line = dual-task condition).

DeKeyser, R. M. (1997). Beyond Explicit Rule Learning: Automating Second Language Morphosyntax. *Studies in Second Language Acquisition*, 19(2), 195-221.

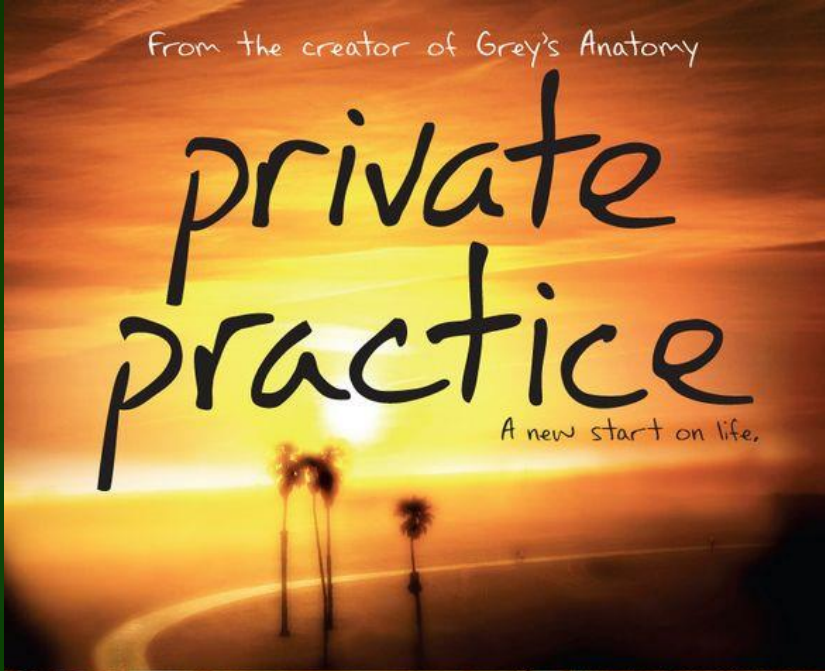
The power law of practice is a consistent empirical phenomenon which shows that error rate and reaction times go down with repeated practice. But outside of laboratory settings, in the conditions of real language classrooms, it is hardly possible to offer sufficient opportunities for controlled practice.

<http://img1.bdbphotos.com/images/orig/c/u/cuiw646vwecbv6ew.jpg>

From the creator of Grey's Anatomy

private practice

A new start on life.



wednesdays 9/8c **abc** start here
series premiere september 26th abc.com

In language classrooms, we have more interesting things to do than drilling - we want to primarily offer opportunities for face-to-face interaction and discussion in the target language. Because we lack time in class, controlled practice needs to be done in private, in self-directed contexts.

how to sustain
self-directed
practice



So the question becomes how we can sustain practice in self-directed contexts, without the teacher present, and how we can make practice intrinsically motivating.



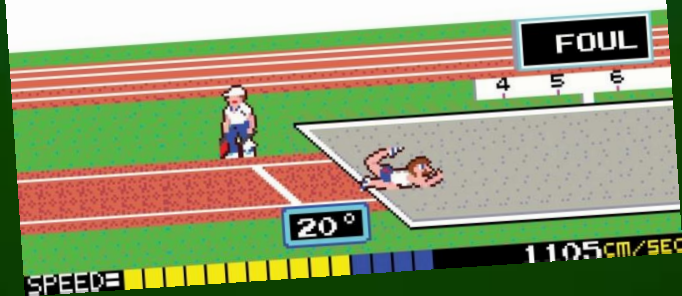
One possible approach is to use elements of game design in CALL. The obvious angle of attack, then, is to look at rewarding systems, such as points, collectables, levelling, etc. But a substantial body of research in motivational psychology suggests that such rewarding systems may not be most effective in terms of intrinsic motivation, and may even undermine it (e.g. [Deci, Koestner, & Ryan, 2001](#)).

playfu⁺THINKING SERIES

The Art of Failure

An Essay on the Pain of Playing Video Games

Jesper Juul



The non-obvious angle of attack for dealing with the motivation problem is to look at something which – at first sight – is diametrically opposed to motivation, namely failure. Games have been praised for being remarkably different from real-world activities in terms of their capacity to deal with failure.

positive

failure

feedback

When we fail in good games, we get positive failure feedback.

a **vivid** demonstration of the
players' agency in the game



@avantgame



Jane McGonigal

*Reality Is Broken: Why Games Make Us Better and
How They Can Change the World (2011)*

Game designer and critic Jane McGonigal writes that failure in real life typically makes us disappointed. But in games, feedback on failure affects our motivation positively: it is vivid, energizes us, and gives us the power to persevere through failure.

46:28

x1

200

I REPORTED HIM THE SECRET OF
THE RECIPE.



incorrect
(F)

correct
(J)

Such vivid feedback is typically contingent upon the fantasy of the game. This is the representational context of the game that sets up the meaningful goals we pursue, such as retrieving a stolen recipe by interrogating witnesses.

42:04

x1

200

I REPORTED HIM THE SECRET OF
THE RECIPE.



incorrect
(F)

correct
(J)

And when we fail in a fantasy, something vivid happens that is related to this fantasy.

The distinguishing feature of the emotions we feel in a representational context is that there is no threat of pain or harm in the real world.



@blaurel



Brenda Laurel

Computers as Theatre (1993)

Now the result of failing in a fantasy, of failing in a vivid representational context, is that we are less likely to attribute failure to ourselves. When we have stepped into the magic circle, the real-world consequences of our failures are more remote.

	corrective feedback	vivid corrective feedback
no fantasy	A	?
fantasy	B	C

So, this study addressed two dimensions associated with controlled practice in game-like language learning: fantasy, and vividness of corrective feedback (which depends on fantasy).

hypotheses

1. Fantasy and vivid CF have positive effects on perceived immersion and competence.
2. Perceived immersion and competence are positively related to interest/enjoyment and willingness for future practice.

On the basis of a recent model of intrinsic motivation in gaming environments ([Ryan, Rigby, & Przybylski, 2006](#)), we hypothesized that fantasy and vivid CF could increase perceptions of competence and immersion, which could in turn result in higher levels of interest/enjoyment and more willingness to practice in the future.

METHOD

[A]
no fantasy
CF

50:18 x1 0

HE INVENTED THEM THE FINAL RECIPE.

X

incorrect (F) correct (J)

[B]
fantasy
CF

49:55 x1 300

HE HASN'T DICTATED ME THE SECRET RECIPE.

X

incorrect (F) correct (J)

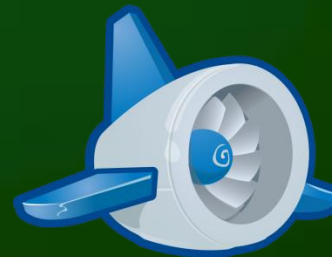
[C]
fantasy
vivid CF

47:22 x1 200

HE INTRODUCED ME THE BOSS OF THE COMPANY.

X

incorrect (F) correct (J)



Three versions of a speeded grammaticality judgment task were developed that differed with respect to the presence of fantasy and vivid corrective feedback.

A

50:18

x1

0

HE INVENTED THEM THE FINAL
RECIPE.



incorrect
(F)

correct
(J)

The baseline version comprised features commonly associated with games, such as time pressure and points systems, as well as regular corrective feedback.

49:55 x1 300

HE HASN'T DICTATED ME THE SECRET RECIPE.



incorrect (F) correct (J)

The second version comprised the fantasy of a detective that questions witnesses in search of the stolen recipe of Coca Cola. This version contained regular corrective feedback.



The third version comprised vivid corrective feedback: in response to failure, any of three animations was shown. Pilot runs and best practices in game design indicated that such variation was necessary.

BRIEFING

You are a private detective. The recipe of the famous Coca Cola soft drink has been stolen. You have been hired to retrieve it.

With your new device, the Tele-Interrogator, you can interrogate people from a distance. Your task is to question potential suspects, in order to collect evidence about the stolen recipe.

Note that some potential suspects speak grammatically correct English, others don't. For each sentence, you need to decide whether it is correct or not. If it is correct, press [J]. If it is incorrect, press [F].



You will have to do this quickly, for you have only 60 seconds (one hour in fictional time) to interrogate as many people as possible.

One final note—the Tele-Interrogator is a prototype version. The engineers didn't test it thoroughly. If you make a mistake, it will malfunction, so be careful!

START

DEBRIEFING

1200

your best score: 5700



Woops, it looks like your machine made a couple of persons unhappy. Don't worry – the Department of Complaints is dealing with it ...

Meanwhile, here is some information that may help you to prevent this from happening in the future!



YES, I OBTAINED HIM SOME COLA LEAVES.

This sentence contains a longer verb, and the final part of the verb is stressed. Therefore, the construction without preposition is incorrect.



INDEED, I TELEGRAPHED HIM THE SECRET.

This sentence is entirely correct. It contains a longer verb, but the final part of the verb is not stressed. Therefore, the construction without preposition is possible.



HE HAS NEVER PHONED ME THE RECIPE.

Before and after practice, respectively, the learners saw a briefing and debriefing screen. These were adapted to the condition.

language pre-test	instruction	each condition: 2 x practice + questionnaire			language post-test
		A	B	C	
		A	C	B	
		B	A	C	
		B	C	A	
		C	A	B	
		C	B	A	

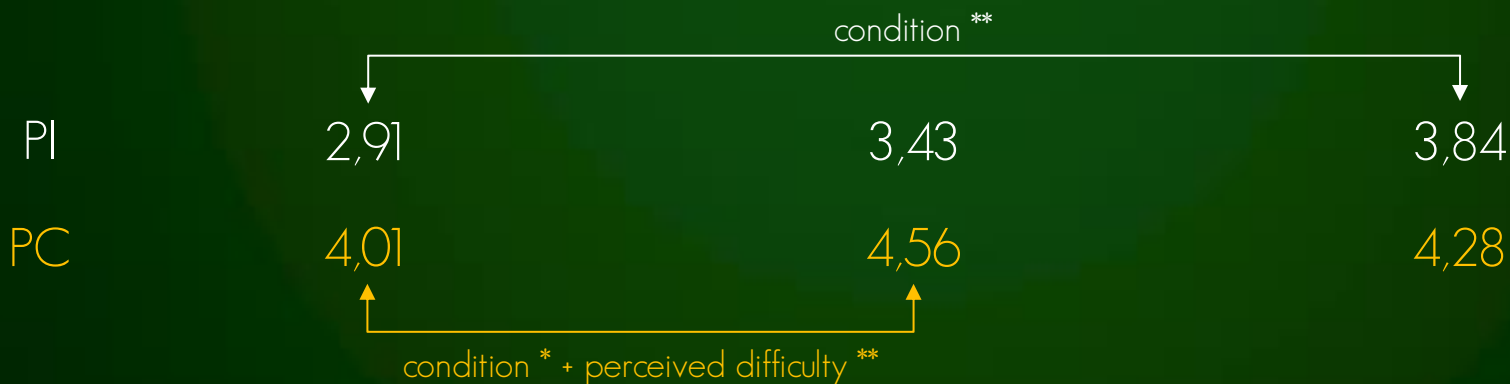
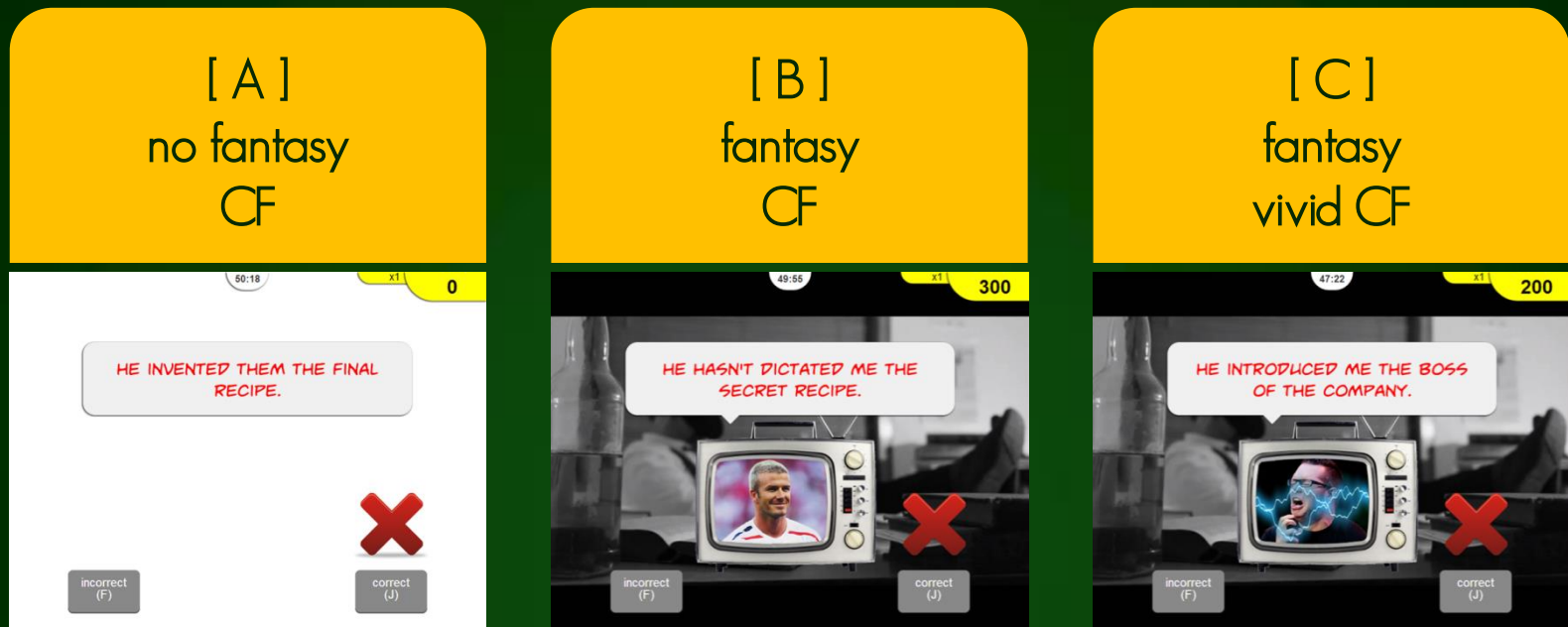
N = 32



The study used a within-subjects experimental design, in which all participants practised dative alternation in English in all three conditions, but in a different order. After each practice round, they filled out questionnaires. Before the experiment, they were instructed on dative alternation, and they also completed pre- and post-language tests on this linguistic structure.

FINDINGS

perceived immersion & perceived competence



** $p < .01$, * $p < .05$

Quantitative analyses of the questionnaire data showed that, on a 7-point Likert scale, the mean score for perceived immersion was significantly higher in condition C in comparison with condition A, and that, when controlling for perceived difficulty, the mean score for perceived competence was significantly higher in condition B in comparison with condition A.

interest & willingness for future practice

variable	1.	2.	3.	4.
1. perceived immersion	—	.02	.68**	.57**
2. perceived competence		—	.41*	.31
3. interest/enjoyment			—	.68**
4. willingness for future practice				—

Pearson's r correlation coefficients, adjusted for multiple comparisons using Holm's method
(** $p < .01$; * $p < .05$)

Correlation analyses showed that perceived immersion and perceived competence were positively related to interest/enjoyment, which in turn was strongly related to willingness for future practice.

student

that sound ... when you're wrong,
there is a special effect ...
this made me nervous,
because you lose a lot of time

The quantitative results were somehow in contrast with follow-up interviews. Vivid feedback made learners feel they lost more time in the speeded practice task - this wasn't the case, in objective terms.

student 1

the background wasn't really
distracting ...

student 2

it is not animated

student 3

especially the moving images ...
in the first two versions, you could
concentrate equally well, but in the
third version less

They also found the animations in the vivid feedback distracting.

student

i thought the second version was best for mistakes, because in the third version, it was like ... let's make a mistake, so that it shows a funny effect

interviewer

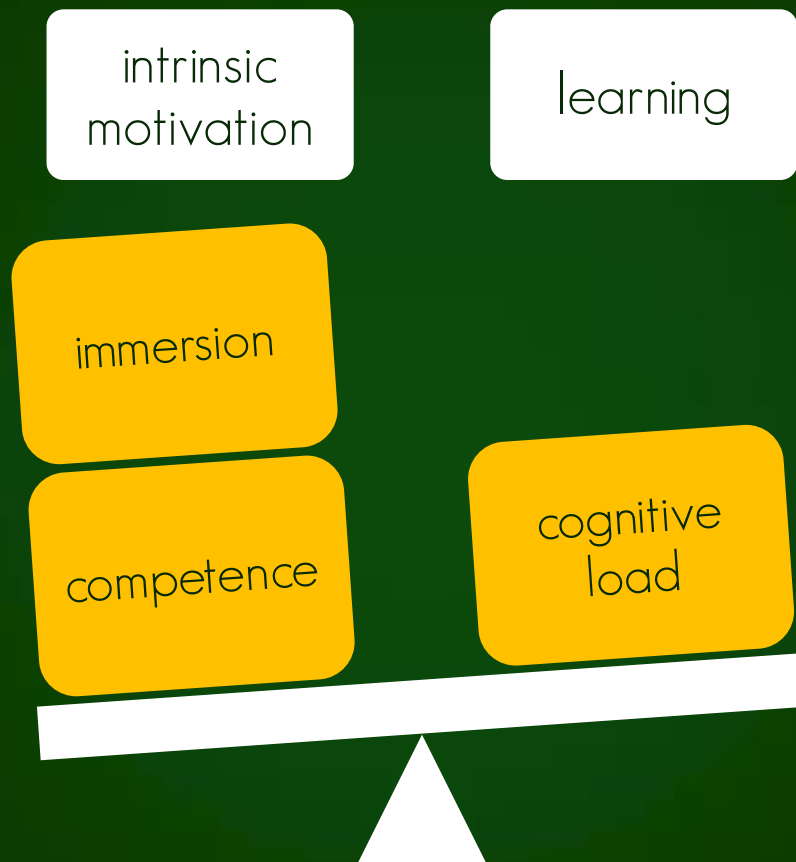
why do you do that?

student

i just thought, sometimes it was fun... the same effect, or another one

None of the 6 interviewed students preferred the version with vivid feedback. However, one student reported that he had engaged in 'gaming behaviour': he had sought out failure, just to find out what would happen if he made a mistake. He said this was fun.

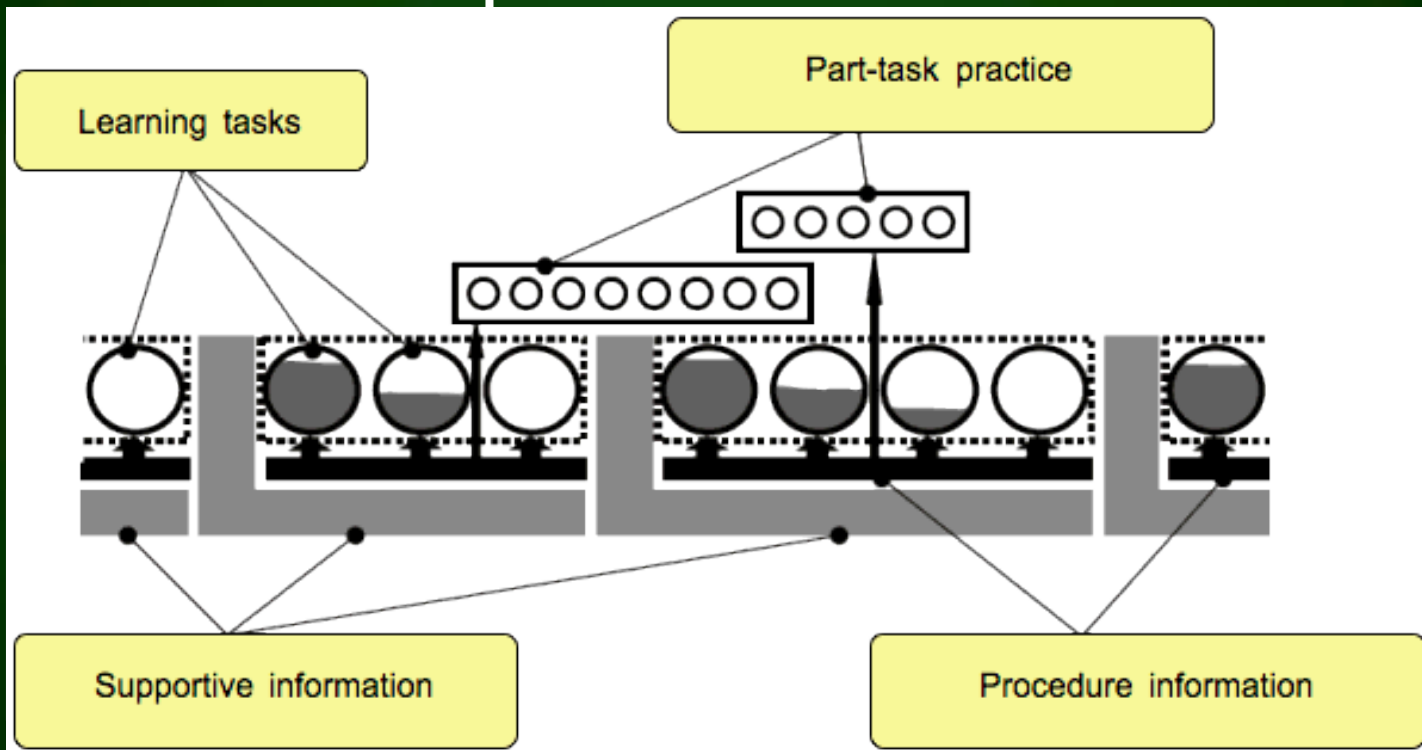
FUTURE WORK



This study showed that fantasy and vivid corrective feedback may make learners feel more competent and immersed, which in turn may determine how much they enjoy practice, and how much they are willing to practise in the future. However, follow-up interviews indicated that enjoyment parameters might need to be carefully balanced with cognitive load (see also [deHaan et al., 2010](#)).

#1

make practice meaningful



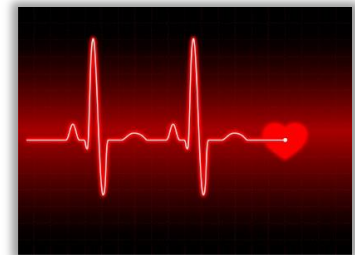
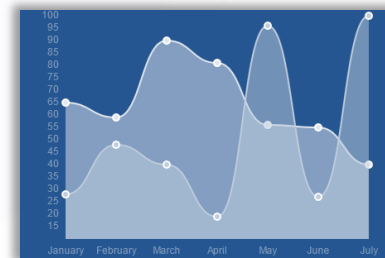
Van Merriënboer, J. J. G., & Kirschner, P. A. (2007). *Ten steps to complex learning. A systematic approach to Four-Component Instructional Design*. Mahwah, New Jersey: Lawrence Erlbaum Associates.

In future research, controlled practice needs to be made meaningful. Practice tasks could be embedded in more complex and authentic language tasks, and transfer to more communicative skills could be investigated.

http://trueslant.com/michaelshermer/files/2010/06/House-No-Lies-house-md-561420_1680_1050.jpg



EVERYBODY LIES.



HOUSE™

This study was limited in the sense that it relied on self-report in order to measure motivation. Future studies could in addition rely on behavioural measures, such as time on task (and how practice evolves over time), and perhaps psychophysiological measurements of enjoyment (Ravaja et al., 2006).



@fcornillie



slides up here -- do interact !

Thank You !



next-
gen