COMPARING THE EFFECT ON ACHIEVEMENT, PERSISTENCE AND LEARNERS' SATISFACTION OF USING TECHNOLOGIES TO GIVE FEEDBACK INSTEAD OF WRITING

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Cégep à distance

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Feedback : what does it mean in this study?

All the information provided to the learner by his tutor, as to his academic achievements or his understanding of the subject, when correcting evaluations. It aims to improve learning, persistance and academic success.
(Facchin, 2018, p. 14)

Feedback using technologies: Other means than written to give feedback to learners (audio, video, visioconference)

. Facchin, S. (2018). *La rétroaction traditionnelle ou technologique? Impact du moyen de diffusion de la rétroaction sur la persévérance et la réussite scolaires* (rapport de recherche PAREA nº PA-2015-024). Montréal, Québec : Cégep à distance.

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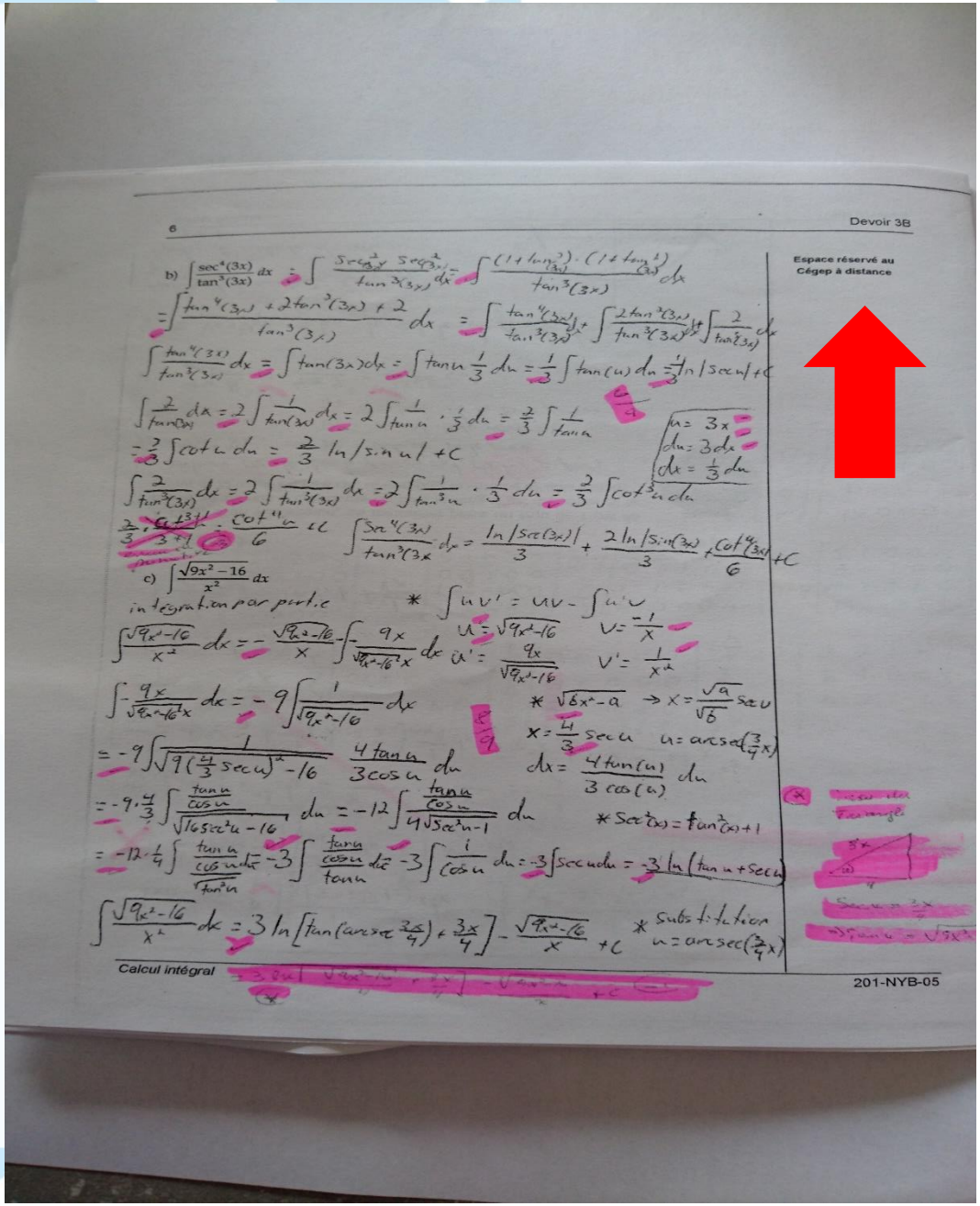

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Devoir 3B

Espace réservé au Cégep à distance

b) $\int \frac{\sec^4(3x)}{\tan^3(3x)}\,dx = \int \frac{\sec^2(3x)\cdot\sec^2(3x)}{\tan^3(3x)}\,dx = \int \frac{(1+\tan^2(3x))\cdot(1+\tan^2(3x))}{\tan^3(3x)}\,dx$

$= \int \frac{\tan^4(3x)+2\tan^2(3x)+2}{\tan^3(3x)}\,dx = \int \frac{\tan^4(3x)}{\tan^3(3x)}\,dx + \int \frac{2\tan^2(3x)}{\tan^3(3x)}\,dx + \int \frac{2}{\tan^2(3x)}\,dx$

$\int \frac{\tan^4(3x)}{\tan^3(3x)}\,dx = \int \tan(3x)\,dx = \int \tan u \cdot \frac{1}{3}\,du = \frac{1}{3}\int \tan(u)\,du = \frac{1}{3}\ln|\sec u| + C$

$\int \frac{2}{\tan(3x)}\,dx = 2\int \frac{1}{\tan(3x)}\,dx = 2\int \frac{1}{\tan u}\cdot\frac{1}{3}\,du = \frac{2}{3}\int \frac{1}{\tan u}$

$= \frac{2}{3}\int \cot u\,du = \frac{2}{3}\ln|\sin u| + C$

$u = 3x$
$du = 3dx$
$dx = \frac{1}{3}du$

$\int \frac{2}{\tan^3(3x)}\,dx = 2\int \frac{1}{\tan^3(3x)}\,dx = 2\int \frac{1}{\tan^3 u}\cdot\frac{1}{3}\,du = \frac{2}{3}\int \cot^3 u\,du$

$\frac{2}{3}\cdot\frac{\cot^{3+1}u}{3+1}\cdot\frac{\cot^4 u}{6} + C$

$\int \frac{\sec^4(3x)}{\tan^3(3x)}\,dx = \frac{\ln|\sec(3x)|}{3} + \frac{2\ln|\sin(3x)|}{3} + \frac{\cot^4(3x)}{6} + C$

c) $\int \frac{\sqrt{9x^2-16}}{x^2}\,dx$

intégration par parties

$* \int uv' = uv - \int u'v$

$\int \frac{\sqrt{9x^2-16}}{x^2}\,dx = -\frac{\sqrt{9x^2-16}}{x} - \int -\frac{9x}{\sqrt{9x^2-16}\,x}\,dx$

$u = \sqrt{9x^2-16}$ $\quad v = \frac{-1}{x}$

$u' = \frac{9x}{\sqrt{9x^2-16}}$ $\quad v' = \frac{1}{x^2}$

$\int \frac{9x}{\sqrt{9x^2-16}\,x}\,dx = -9\int \frac{1}{\sqrt{9x^2-16}}\,dx$

$* \sqrt{bx^2-a} \rightarrow x = \frac{\sqrt{a}}{\sqrt{b}}\sec u$

$x = \frac{4}{3}\sec u$ $\quad u = \operatorname{arcsec}\left(\frac{3}{4}x\right)$

$dx = \frac{4\tan(u)}{3\cos(u)}\,du$

$= -9\int \frac{1}{\sqrt{9(\frac{4}{3}\sec u)^2-16}}\,\frac{4\tan u}{3\cos u}\,du$

$= -9\cdot\frac{4}{3}\int \frac{\frac{\tan u}{\cos u}}{\sqrt{16\sec^2 u-16}}\,du = -12\int \frac{\frac{\tan u}{\cos u}}{4\sqrt{\sec^2 u-1}}\,du$

$* \sec^2(x) = \tan^2(x)+1$

$= -12\cdot\frac{1}{4}\int \frac{\frac{\tan u}{\cos u}}{\sqrt{\tan^2 u}}\,du = -3\int \frac{\frac{\tan u}{\cos u}}{\tan u}\,du = -3\int \frac{1}{\cos u}\,du = -3\int \sec u\,du = -3\ln(\tan u + \sec u)$

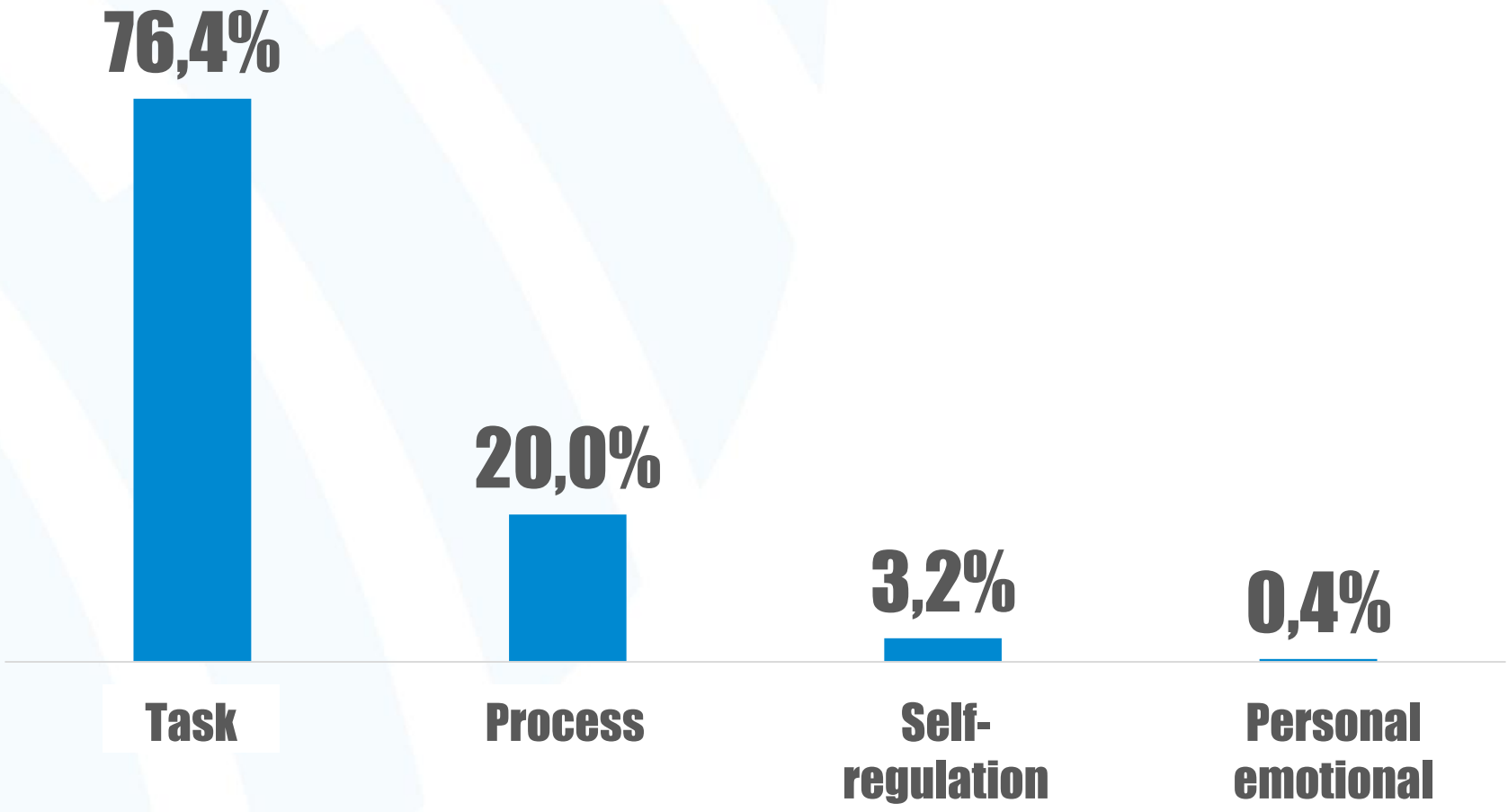
$\int \frac{\sqrt{9x^2-16}}{x^2}\,dx = 3\ln\left[\tan\left(\operatorname{arcsec}\frac{3x}{4}\right) + \frac{3x}{4}\right] - \frac{\sqrt{9x^2-16}}{x} + C$

$* \text{Subst. finale}$
$u = \operatorname{arcsec}\left(\frac{3}{4}x\right)$

Calcul intégral

201-NYB-05

Feedback levels in assignments



Facchin, S. (Manuscrit en préparation). Feedback in distance education: What's in it for my grade?
Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research*, *77*(1), 81-112
Rodet, J. 2000. La rétroaction, support d'apprentissage ? *Revue du Conseil Québécois de la Formation à Distance, 4*(2), 45-74.

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Empirical evidences

Written feedback: takes time, space and learners have troubles to read or to understand what it is meant

Technological feedback:

- Less time consuming
- More feedback, more personal for learners
- Facilitates appropriation because easier to undertsand
- Richer feedback
- More social presence feeling
- Learners more satisfied but is there an impact on academic results?
- Mixed results (no effect) and few quantitative studies with experimental design

Ackerman, D. S., & Gross, B. L. (2010). Instructor feedback: How much do students really want? *Journal of Marketing Education, 32*(2), 172-181.
Arbaugh, J. B., Cleveland-Innes, M., Diaz, S. R., Garrison, D. R., Ice, P., Richardson, J. C., & Swan, K. P. (2008). Developing a community of inquiry instrument: Testing a measure of the community of inquiry framework using a multi-institutional sample. *The Internet and Higher Education*, *11*(3), 133-136.
Ford, S. (2015). *The Effects of Written and Video/Audio Communication on Learners' Perceived Feelings of Connectedness, Course Satisfaction, Participation, and Achievement in an Online Community College Algebra Course.* Texas Tech University.
Ice, P., Curtis, R., Phillips, P., & Wells, J. (2007). Using Asynchronous Audio Feedback to Enhance Teaching Presence and Students' Sense of Community. *Journal of Asynchronous Learning Networks, 11*(2), 3-25.
Johnson, G. M., & Cooke, A. (2016). Self-regulation of learning and preference for written versus audio-recorded feedback by distance education students. *Distance Education, 37*(1), 107-120.
Macgregor, G., Spiers, A., & Taylor, C. (2011). Exploratory evaluation of audio email technology in formative assessment feedback. *Research in Learning Technology, 19*(1), 39-59.
Mathisen, P. (2012). Video feedback in higher education, - A contribution to improving the quality of written feedback. *Nordic Journal of Digital Literacy, 7*(2), *93-117.*
Roberge, J. (2008). *Rendre plus efficace la correction des rédactions*. Rapport de recherche PAREA. Montréal, QC : Cégep André-Laurendeau.
Wade, N. N. (2016). *The Face Of Feedback: Exploring The Use Of Asynchronous Video To Deliver Instructor Feedback In Multidisciplinary Online Courses.* (Doctoral dissertation), Wayne State University.

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Hypotheses

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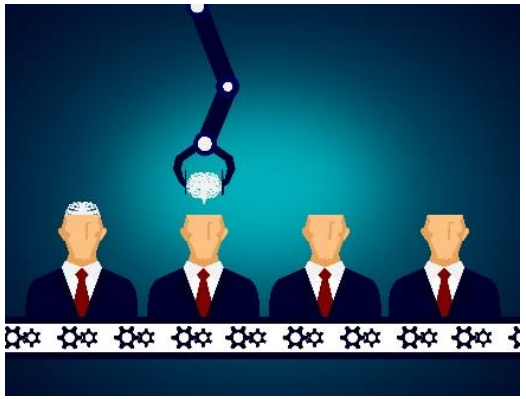

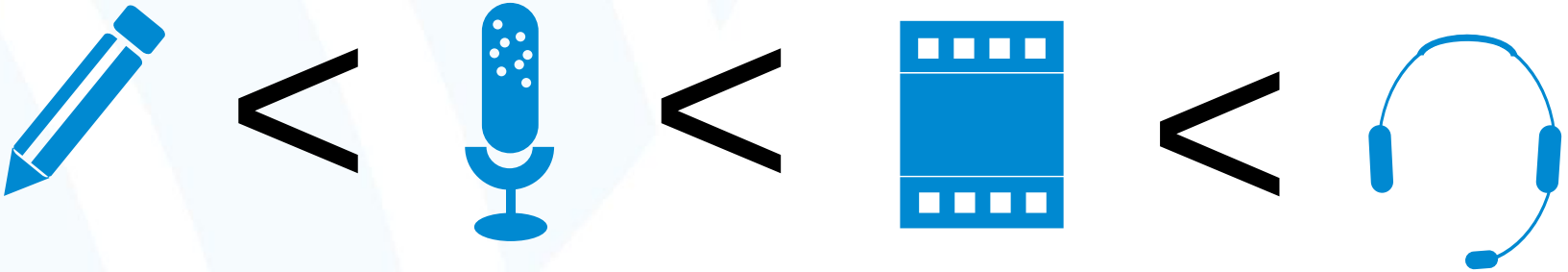

METHOD

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Mixed method

Quasi experimental design

- Experimental group 1 : audio feedback
- Experimental group 2 : video feedback
- Expérimental group 3 : visioconference feedback
- Control group : traditionnal written feedback

Self-report measures at the beginning and at the end

Activities in Moodle (Log)

3 sessions : Winter 2016, summer 2016, fall 2016

4 tutors trained to technological feedback

Mertens, D. M. (2014). *Research and evaluation in education and psychology: Integrating diversity with quantitative, qualitative, and mixed methods*. Thousand Oaks: SAGE Publications, Inc.

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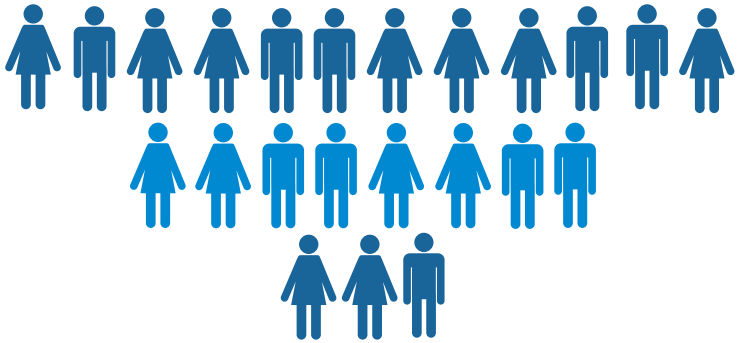

N = 350

574 technological feedbacks

No significant differences for the control and the experimental group regarding gender and previous academic results, except for age:23 years old for the experimental group versus 21 for the control group.

62%

22 ans (*ET* = 5,48)

Mathematic courses

$$\lim_{x \to -\infty} 2^x = 0$$

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Examples

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RESULTS

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Effect on achievement and on drop out rates

- Lower dropout rate (36% vs 44%)
- Higher success rate (47% vs 39%)
- Same failure rate (17%)

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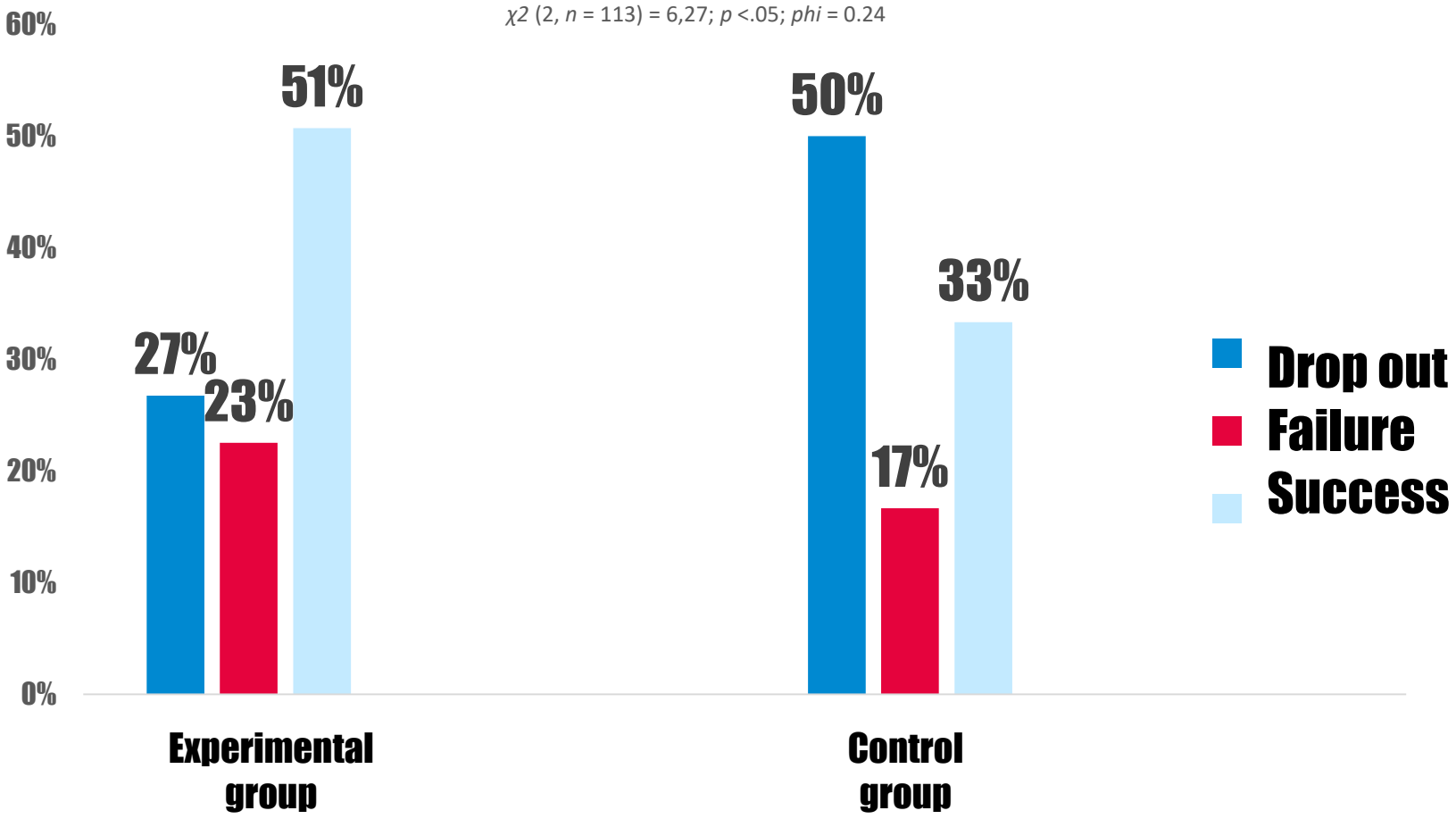
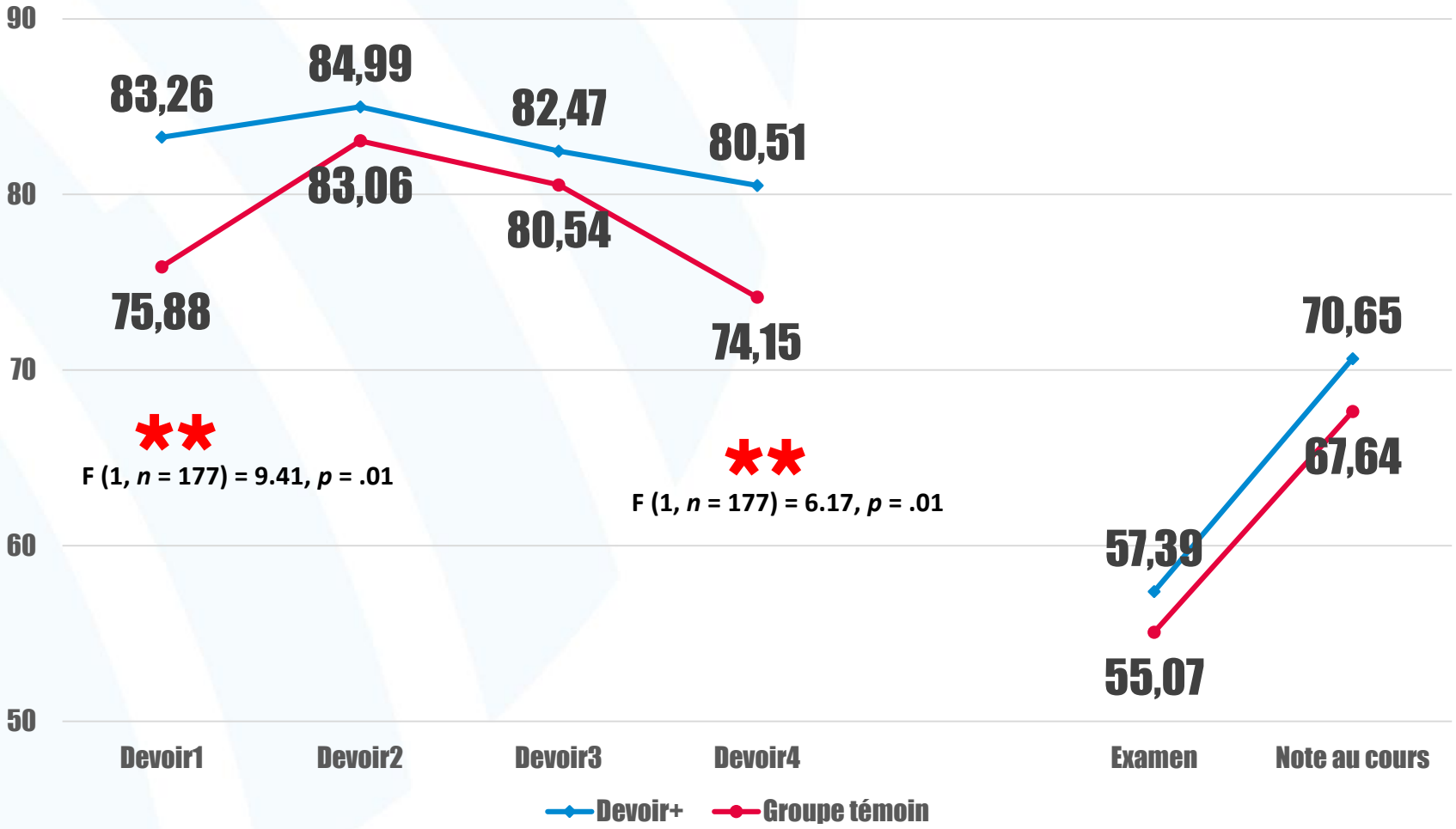
Significant effect (winter session)



Significant differences on grades



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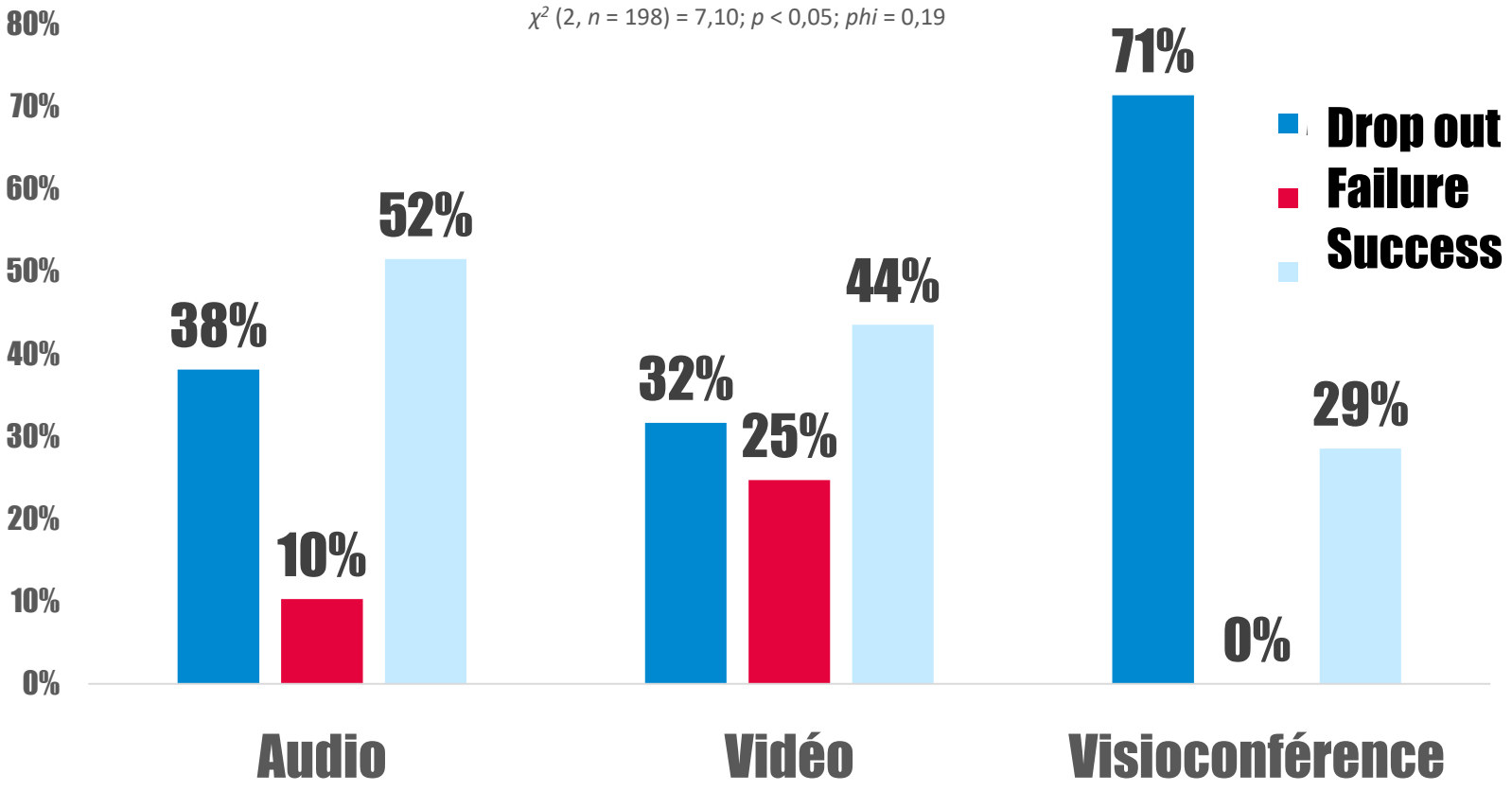
Audio for success and video for dropout



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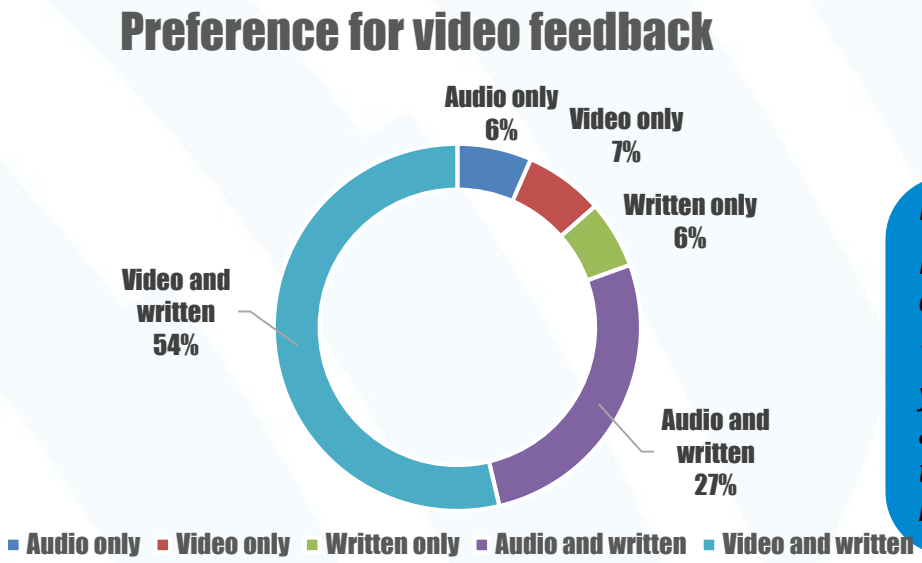
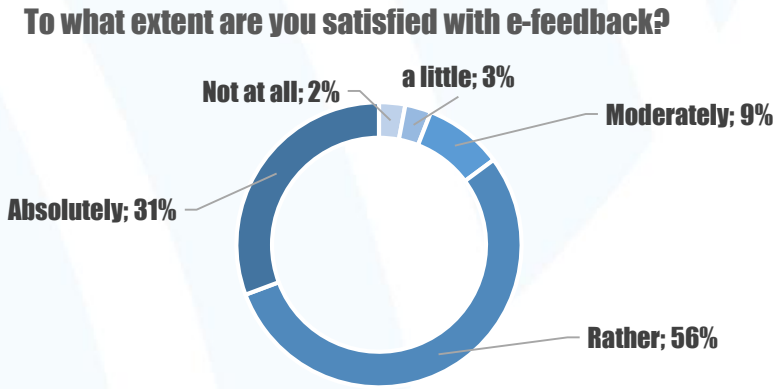
Learners' satisfaction



It is a faster way to hear about your work

It really allowed me to understand my mistakes and to correct myself for the exam.

This is of course due to the fact that Devoir + is still at a young stage, but it would be nice to film the assignment and point out errors at the same time that the tutor explains the mistakes I made. So, it would be as if our teacher was next to us. (learners with audio only)



Access to feedback

Sound or image quality (Camera Ziggy)

Good Internet service

Download file rahter than streaming

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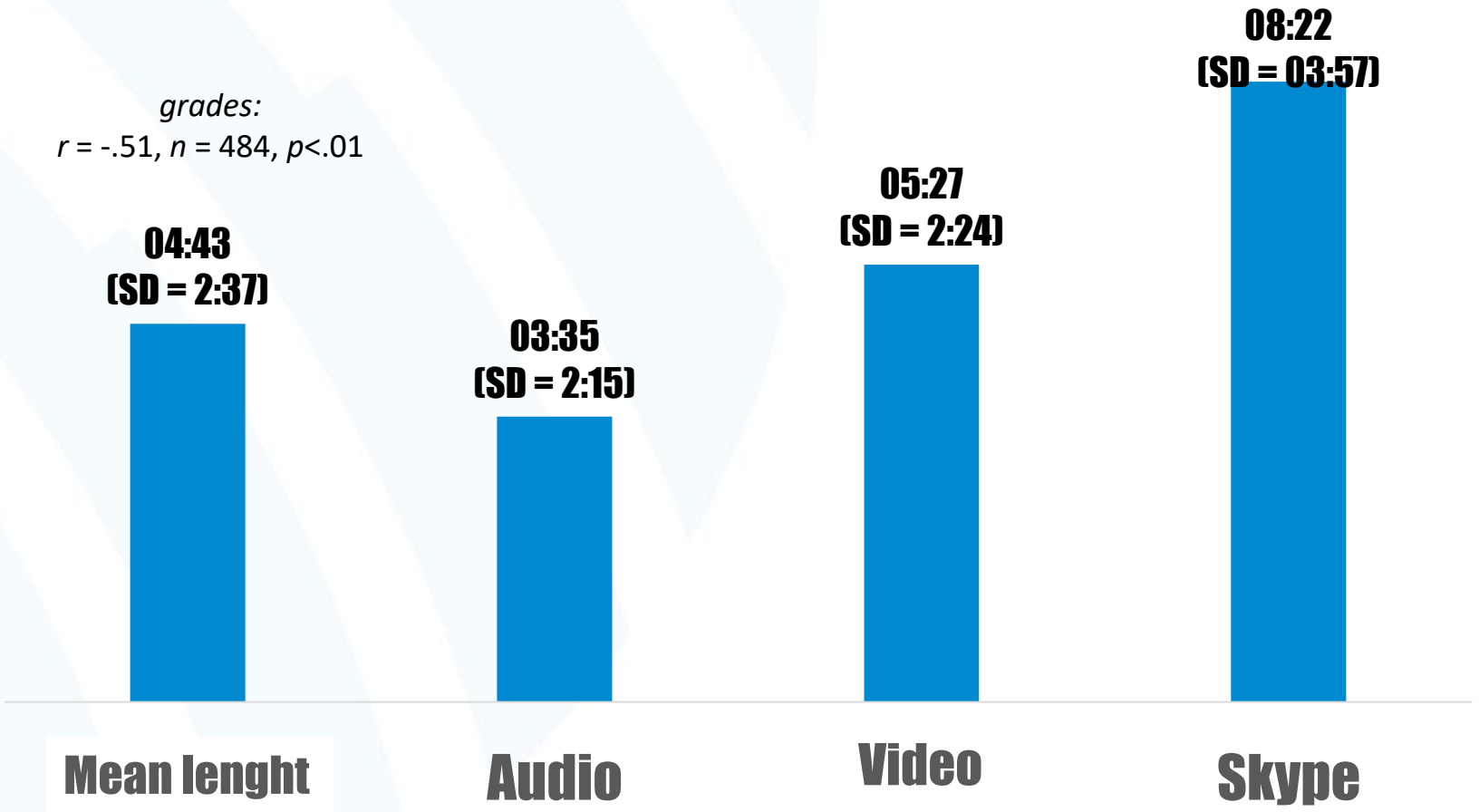
Lenght

grades:
$r = -.51$, $n = 484$, $p < .01$



$F(2, 481) = 49.42$, $p = .01$

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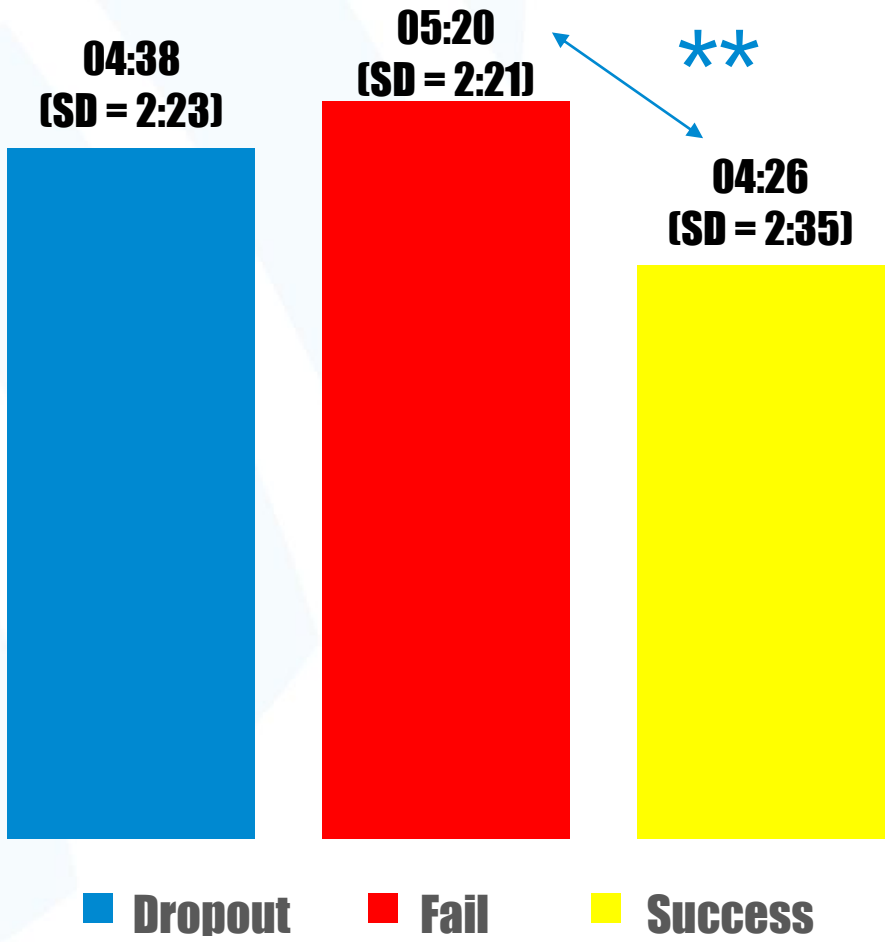
Lenght and academic results



F (2,471) = 5,41, *p* = .01

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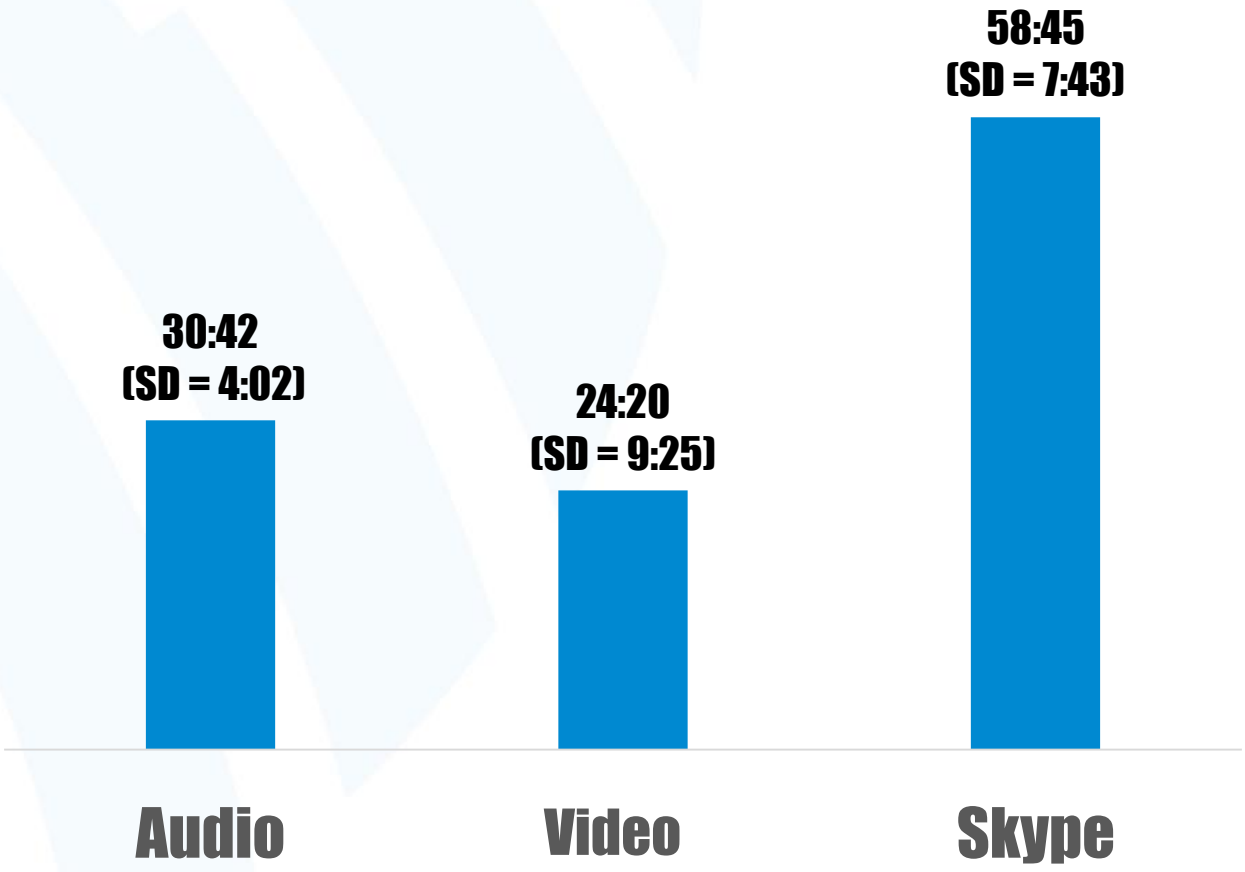
Time to produce and means of feedback



F (2,536) = 148.64, p <.01

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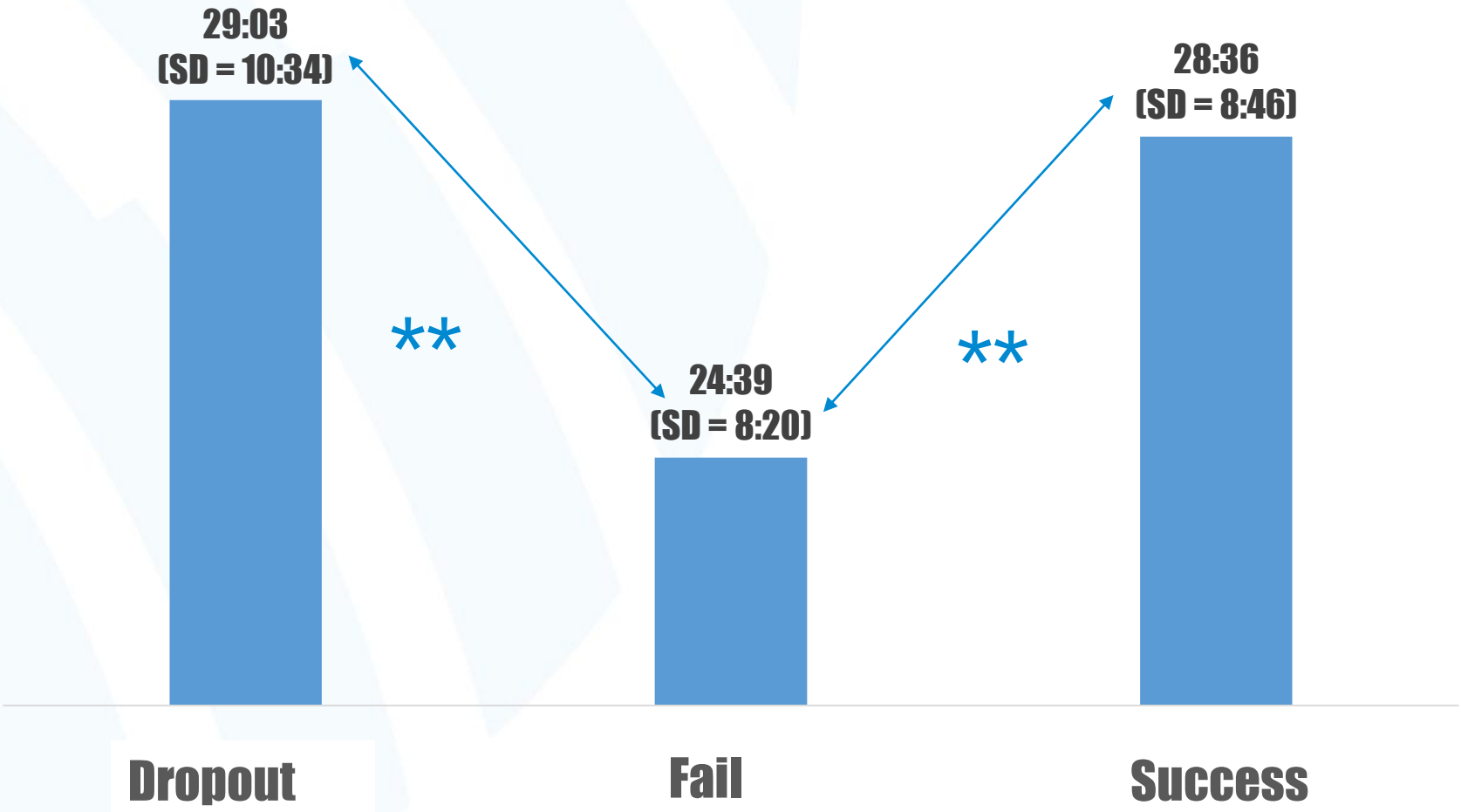
Time to produce and academic results



$F(2, 524) = 9{,}93$, $p < 0{,}01$

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Finally

Effect on achievement.

Difference between means : Audio more focus on the task and video may also include motivational components?

The level of the feedback?

The richness of the medium?

Does the positif effect will still last (longitudinal data)?

Good practices for technological feedback

To foster listening and receptivity:

- Be brief, no more than 5 minutes
- Start with salutation
- Clearly indicate where your comments relate to
- Sum up good points and weaknesses
- End with a question to invite student to reflect
- Be natural!

To foster editing process:

- Quiet place
- Prepare your comments before strating recording
- Do not spend time on redoing your recording
- Ensure to have a good speed of Internet connection
- Keep a copy of your recording and name the file with a unique code pertaining to each learners

To foster the effect of feedback on academic results:

- Feed Up (where I am going?), Feed Back (How I am going?), Feed Forward (Where to next?) (Hattie & Timperley, 2007)
- Go further than academic correction
- Give explanations on why it is wrong and right
- Give examples
- Specify if the goals (competencies) are achieved
- Comments also have to be related to the task rather than on the motivational side only

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Thank you

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Full report available here:
http://bit.ly/Devoirplus

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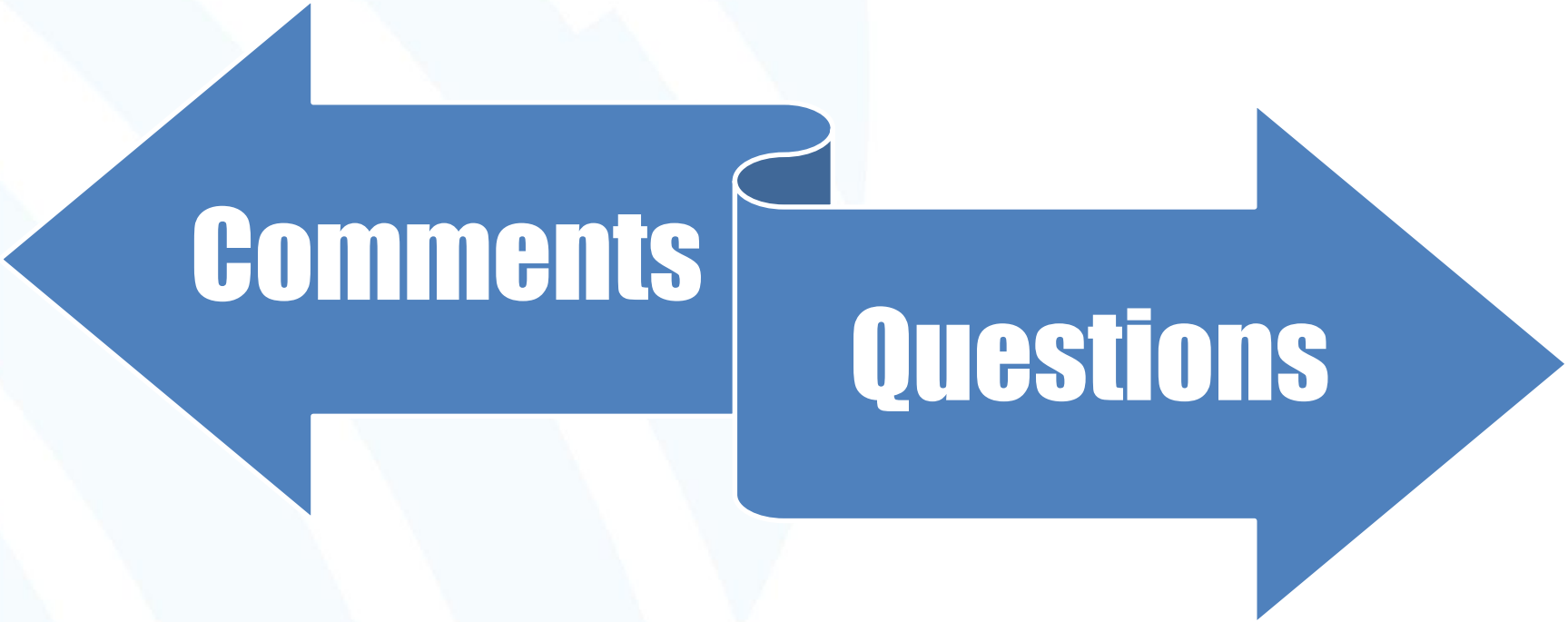

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