Who am I?

- Background in Medicinal Chemistry
- Teacher Pharmaceutical Sciences
  - Faculty of Science, Dept. Chemistry & Phar. Sciences
  - Division of Innovations in Human Health & Life Sciences
- Focus on educational innovation – since 2012
  - ICT in education
  - Blended learning, see also workshop 2.1
- FeedbackFruits pilot project – since 2018
  - VU Network for Teaching & Learning
The next 60 min

- ±45 min
  - Active learning
  - FeedbackFruits tools
  - Implementation pilots

- ±15 min of questions/discussion
  - In between
  - Afterwards (also via mentimeter!)

Classical Teaching

Source: FeedbackFruits
Active learning in Education

- **Opposite: Active learning**
  - Instructional method engaging students in learning

- **Requires students to:**
  - Do meaningful learning activities
  - Think about what they are doing

  E.g. Classroom, homework, simulations, group project, research-based activities

Source: FeedbackFruits
Engagement

motivation × active learning = engagement


Active learning

• Active learning works*
  – Focus on: critical thinking, (peer) feedback, reflection

• Plethora of tools to support active learning
  – Inside and outside of class
  – Many not directly available in canvas
  – Canvas functionalities are limited

• Barrier to incorporate proven innovations
  – Workload
  – Learning curve for different tools

* Freeman S, et al., *PNAS*. 2014, 111, 8410
Use the right tools

- An ideal set of tools should:
  - Be readily available
  - Have a user-friendly & consistent interface
  - Facilitate many forms of active learning
  - Be completely integrated with Canvas
  - Reduce the teacher workload

A solution?

FeedbackFruits

Interactive study material
- Interactive Documents
- Interactive Videos
- Interactive Audio
- Comprehension of Documents
- Interactive Presentation

Teacher feedback
- Assignment Feedback
- Skill Feedback

Peer learning
- Peer Feedback
- Group Member Evaluation
The Long and Winding Road

- June 2018: Presentation FbF
- Dec 2018: BETA agrees to licence
- Data Processing Agreement
- DPIA (privacy)
- Technical assessment (IT)

Order of licence
- June 2019: IT testing
  - Safety
  - Functionality
  - Canvas integration

- First pilot
- Multiple pilots
- June 2019: Start of Licence
- Feb 2019: Other faculties?
- ± Feb 2020-2021

Tools for active learning?

FeedbackFruits

- Interactive study material
  - Interactive Documents
  - Interactive Videos
  - Interactive Audio
  - Comprehension of Documents
  - Interactive Presentation

Teacher feedback
- Assignment Feedback
- Skill Feedback

Peer learning
- Peer Feedback
- Group Member Evaluation
Functionalities: an overview

- Supports:
  - Different file formats
  - Social learning
  - In-line questions
  - Learning analytics
  - Copying existing assignments
  - Group possibilities

Activate students before class

- Aim: Getting students prepared before class
  - Fits with a flipped/blended classroom setting
  - More in-depth discussions during class?

Source: www.universityprimetime.com
Pilot Interactive Document (1)

- Premaster SBI course
  “Theories of Technology Venture Creation”
  - Teachers: Peter van de Sijde en Jorick Houtkamp
  - 20 students, 3rd year
  - Lectures focused on business models
    - Scientific articles & Business case study

- Problems
  - Students do not read articles
  - Too much regurgitation of articles

Pilot Interactive Document (2)

- Redesign setup
  - Before class: all articles as interactive document
    - With questions and remarks
  - Contact hours: tutorials to construct model(s)

- Outcomes of pilot (Teacher interview)
  - Students more active before class
  - More overview on student activity
  - More in-depth discussions during contact hours
  - Students link their case better to the theory
  - Students generally appreciated the format
  - Teacher satisfaction increased
Interactive Document

Metabolic and Genetic Control of Gene Expression on a Genomic Scale

Adding questions & comments

1. Disruptors often build business models that are very different from those of incumbents. Consider the healthcare industry. General practitioners operate out of their offices often only for years of experience and often results in treating patients symptoms, make diagnoses, and offer treatment. We call this a "solution shop" model. In contrast, a number of companies are taking a disruptive path by what we call a "process" business model. They...
Different types of questions

- Practice moment • Required
  Are you required to open data you gather in science to everyone?

- Practice moment
  What other mechanisms regulate protein levels

- Practice moment
  How long did it take you to complete the experiment?

Social learning

- Discussion started by students & teachers
Teacher view

Interactive video & audio

Similar options as for documents
Learning Analytics

Overall student progress

- 4 out of 11 students have started viewing
- 55% average amount of correct practice questions
- 20 comments in total

Statistics per active student

<table>
<thead>
<tr>
<th>Student</th>
<th>Viewed</th>
<th>Marked as done</th>
<th>Practice questions correct</th>
<th>Total comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lara Wilkens</td>
<td></td>
<td></td>
<td>25% 0.5/2</td>
<td>6</td>
</tr>
<tr>
<td>Chris Colin</td>
<td></td>
<td></td>
<td>50% 1/2</td>
<td>4</td>
</tr>
<tr>
<td>Joshua Weber</td>
<td></td>
<td></td>
<td>55% 1.66/3</td>
<td>5</td>
</tr>
<tr>
<td>Sachida Wahid</td>
<td></td>
<td></td>
<td>77% 2.33/3</td>
<td>5</td>
</tr>
</tbody>
</table>

Feedback and Reflection

- Regular feedback gives direction
  - Students want more feedback
  - Giving feedback costs more time?!

- (Peer) Feedback including reflection
  - Incites critical thinking
  - Improves quality of final product

Source: www.dubeat.com

FeedbackFruits for Feedback?

- **Feedback plugins**
  - Relatively simple interface
  - Process guidance & automation
  - Group & individual assignments

Peer learning
- Peer Feedback
- Group Member Evaluation

Teacher feedback
- Assignment Feedback
- Skill Feedback

FeedbackFruits tools support:

- Different file formats
- Set deadlines
- Reviewer anonymity
- Advanced group settings
- Automatic or manual distribution
- In-text feedback

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Bij de ziekte van Parkinson stomen dopaminerge (dopamine producerende) zenuwcellen af; Loboa, A. (Kees, 2011). Het neurale netwerk is dus in onbalans. Omdat het neurale netwerk veel andere effector systemen beïnvloedt, raken veel andere systemen en het lichaam de gevolgen dus ook in onbalans. De celkernen van de dopaminerge zenuwcellen liggen hoofdzakelijk in de zwarte kern (substantia nigra) in het middenhoofd van de hersenen en spelen uit naar het striatum. U. (Booij, 1998) dit is een belangrijk hersenreel bij de regelmatig van de motoriek. De degerenatie van de dopaminerge zenuwcellen zorgt zo voor een

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FeedbackFruits tools support:

- Use scale rating- or rubrics criteria
- Coupling of feedback to criteria
- Set specific demands for the review
- Reflection on received feedback
- Integrated view with all received feedback
- Summative/formative assessment

Pilot with FeedbackFruits

- Innovatieproject Geneesmiddelen
  - Coordinator: Prof. dr. Rob Leurs
  - Pharmaceutical Sciences / Science, Business & Innovation
  - 1st year bachelor students (±150)
  - Project groups of 6 students

- Each group ‘develops’ a drug
- Weekly (brief) guidance from teachers/TA’s

Problems
- Feedback and logistics quite labor intensive
- Limited overview of student progress
- Different perceptions of expectations
Pilot Setup

• Major aims of improvement
  – Better overview of progress
  – Lower teacher workload
  – Students know better what to do
  – Equal distribution of student efforts

• Setup of pilot
  – Teacher feedback on early products
  – Peer feedback on mid-term report
  – Teacher feedback/assessment on final report
  – Peer feedback on collaboration

Results Pilot

• Overall positive!
  – Deadlines for each step
  – Feedback process takes less time
  – Monitoring of whole process
  – Students generally satisfied
  – Feedback quality generally OK
    • Feedback directly linked to grading criteria
  – Quality of final product is higher
  – Fewer problems with unequal student efforts
Student evaluation (n=52)

- Rate the functionality of FeedbackFruits?
  - 88% Sufficient to good

- How user-friendly is FeedbackFruits?
  - 75% (Very) User-friendly

- FeedbackFruits next year again in this course?
  - 80% (Strongly) Agree

- Recommend FeedbackFruits for further rollout?
  - 69% (Very) Sure

Student view

Feedback on "Groep 17 Ziekte van Parkinson en D2 receptor" by "

Molecular basis

Dopamine is a neurotransmitter and has a major role in the brain. It is released from the terminals of nerve cells. Dopamine acts as a neurotransmitter at the postsynaptic membrane. When it binds to its receptor on the postsynaptic membrane, it stimulates the release of a second messenger, cyclic AMP (cAMP), which activates protein kinases and alters the activity of ion channels in the plasma membrane. This process is known as receptor-mediated signal transduction.

The D2 receptor belongs to the G protein-coupled receptor family and is coupled to a G protein. It is activated by dopamine and transmits signals to the cell's internal machinery. This receptor is coupled to the G protein Gi, which inhibits adenyl cyclase, thereby reducing the production of cAMP and reducing the activity of the cell.

The role of the D2 receptor

Dopamine is a neurotransmitter that plays a crucial role in the brain. It is involved in various functions, such as movement, mood, and cognition. The D2 receptor is a key player in the dopamine signaling pathway and is involved in regulating the release of dopamine from nerve terminals. Understanding the role of the D2 receptor is crucial for developing treatments for neurological disorders, such as Parkinson's disease and schizophrenia.
Teacher view

Groups that submitted all reviews

<table>
<thead>
<tr>
<th>Name</th>
<th>Reviews</th>
<th>Criteria done</th>
<th>Average time per review</th>
<th>Total review comments</th>
<th>Feedback per 1%</th>
<th>Feedback per 1%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groep 1: malaria + tar...</td>
<td>45 / 45</td>
<td>98 min</td>
<td>69</td>
<td>7.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groep 2: malaria + tar...</td>
<td>54 / 54</td>
<td>191 min</td>
<td>106</td>
<td>7.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groep 3: malaria + tar...</td>
<td>54 / 54</td>
<td>133 min</td>
<td>133</td>
<td>7.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groep 4: malaria + tar...</td>
<td>36 / 36</td>
<td>149 min</td>
<td>90</td>
<td>7.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groep 5: malaria + tar...</td>
<td>45 / 45</td>
<td>92 min</td>
<td>72</td>
<td>7.6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Analytics for each step allows monitoring

Disadvantages

- No student view
- Some browsers give issues
- Incidental stability issues
- Teacher overview suboptimal
- No plagiarism check
Conclusions and outlook

- FeedbackFruits supports activating teaching
  - Interactive study materials and (peer) feedback

- First pilots are promising (>600 students)
  - Teachers want to use it again
  - Students generally satisfied

- Investigating possibility for VU campus licence
  - VU Network for Teaching & Learning (http://vu-ntl.nl)

Questions?

- Who can use the tools?
- How much time does it cost me?
  - Do I need to redesign my complete course?
- Can you just use all content (books, articles)?
- What support is available?
- Are the tools suitable for other study programs?
- Why not use canvas (peer) feedback?

- What did I not address?
- Other questions?
Continuous Improvement

- Language
  - ✔️ Document must be written in Dutch: Passed

- Number of words
  - ✗ Document must contain 1000 to 2000 words: 2158 words

- Page numbers
  - ✗ Document must have page numbers for each page: Failed

- References
  - ✗ Document must contain 1 to 3 references in APA style: 5 references

- Sections
  - ✔️ Document must contain section “discussie” of at most 600 words: 475 words
  - ✔️ Document must contain section “inleiding” of at least 200 words: 231 words

Other Questions?

- Onderwijswerkplaats: HG-1B.21
  - onderwijswerkplaats@vu.nl
  - https://tinyurl.com/sig-feedbackfruits

- Danny Scholten
  - danny.scholten@vu.nl
Acknowledgments

Faculty board BETA
- Jacqueline van Muijlwijk
- Bart van Leijen

VU NT&L / SOZ
- Silvester Draaijer
- Gerdien Jansen

IT
- Rob van Leeuwen
- Chris Hermsen

FeedbackFruits
- Jan Hein Gooszen
- Annika Borgstede
- Boudewijn van Groos

Teachers BETA
- Anneke Vuuregge
- Jorick Houtkamp
- Peter van de Sijde
- Jochem van Roon
- Rosa Pols
- Madison Carr
- Marianne Donker
- Robin Bense
- Roos Oerlemans
- Tom Vaessen
- Rob Leurs
- Chris Vos
- Kevin Augustijn
- Stefan Dekker
- Sophia de Jong