Bahrain Polytechnic بوليتكنك البحرين

SCRUM + PBL

An insight on its effectiveness in a Game Development course

Agenda

- Introduction to the course
- How we chose SCRUM
- How we use SCRUM
- Why we like SCRUM
- Samples of students’ work

About the Game Development Course

- Year 3
- Level 8
- 15 Credits

- **Programme:** Information and Communications Technology
- **Major:** Programming

About the Game Development Course

For the Techies

- **Software:** Unity3D, Visual Studio
- **Language:** C#

About the Game Development Course

What students do

- **Main Outcome:** To build a playable game

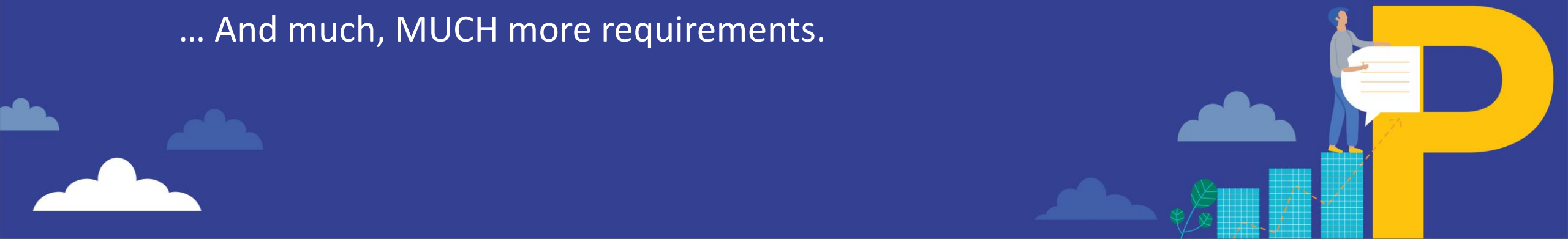
- Most students come into this course with little to no knowledge of how games are made.
- This course *teleports* the students to a *whole new world*, and puts their *acquired ICT skills* to the test.

How we chose Scrum

The Project

- Students must develop a game that…:
  - Has 5 levels
  - Includes some implementation of physics
  - Includes some implementation of collision detection
  - Includes visual effects
  - Includes music and sound effects
  - Has functional User Interface

  … And much, MUCH more requirements.



Students’ Approach

- Students take those requirements, and jump right into the development.
- Most students spent too much time on processes they enjoyed the most.
- Observed results:
  - Slow progress at the start.
  - Rushed development at the end.
  - Too many unfinished features.
  - Final product fails to meet what students had envisioned.
  - Bugs galore.

- Students’ full potential was not realized due to bad planning.

The way forward

- We wanted better games.
- We analyzed what we had at hand:
  - The aforementioned “unfinished” games were produced by very good students.
  - The other non-game projects produced by the students were of high standard.
  - Although their games needed polishing, most of them still manage to tick off all of the basic requirements.

What we already know

- Game development software engineering (GDSE) is tricky, and it differs from traditional software engineering.
- GDSE has to also account for the “fun” factor.
- “Fun” in itself is hard to define.

- It was clear that we needed to treat this course’s project differently.

Receiving Feedback

- At that time, we received feedback from External Moderation noting the opportunity of implementing different types of GDSE's in our courses across the programme.
- Of course, Scrum was suggested!
- Our Game Development course happened to be a good candidate for this.

Perfect Timing

Taking Action

- We dove deep into Scrum, analyzing how it works, and more importantly why it works.
- As a methodology, it seemed like a perfect fit for game development.
- But was it a perfect fit for the course?

How it works

- In a nutshell, the project is broken down into “Sprints”.
- Each sprint can be from 2 weeks to 1 month long.
- In each sprint, the SCRUM team focuses on a number of features selected from the product backlog.

- Essentially, a SCRUM team consists of:
  - A Product Owner
  - A SCRUM Master
  - The Developers / Artists / Engineers / etc.

How it works

- Product Owner is responsible for the **Product Backlog**.

*The **Product Backlog** is a list of all requirements that are known to the Scrum team.*

- The Scrum team agree on a Sprint goal, and select the requirements that must be completed to reach that goal, creating a **Sprint Log**.

*The **Sprint Log** is a list of tasks selected by the Scrum team that lead to the Sprint goal.*

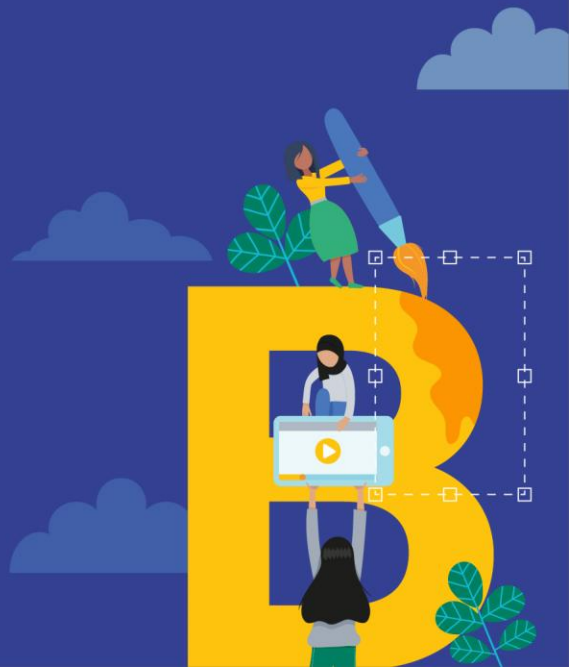
How it works

- The Scrum Master’s role is to ensure that the team is “agile”.
  - *Identify and solve problems*
  - *Oversee team’s progress and processes*
  - *Ensures that Scrum values and processes are followed correctly*

Sounds neat, but…

- In a 4 months course, we don’t have the luxury of allocating 2 weeks to 1 month to a single sprint.
- Students aren’t expected to be **Scrum Masters**.
- Nor should one student be given the burden of managing the **Product Backlog** for their team.

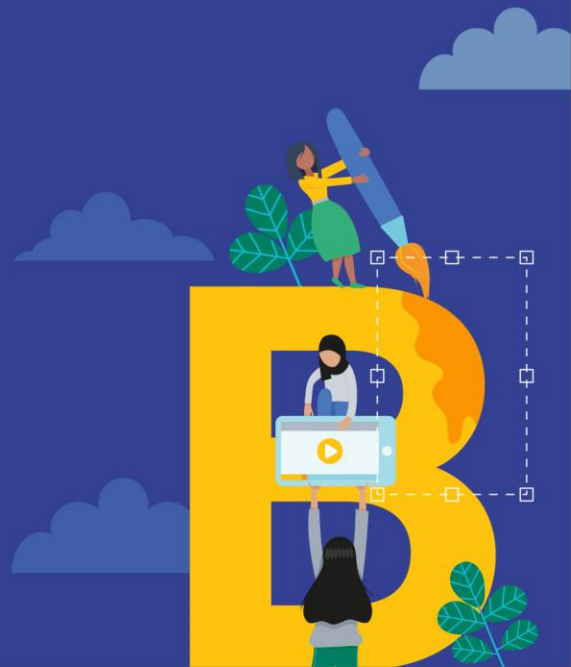
How we use Scrum



Scrum with House Rules

- We have adopted a softer version of Scrum, and have customized it to make it our own.
- In this version of Scrum, the Product Owner and Scrum Master roles are combined into one that we like to call:

The Tutor



Our Process: B.S.

Introduce Project → Form Teams → Provide Teams with Basic Reqs.

Get to work

Our Process: Today

Introduce Project → Form Teams → Provide Teams with Product Backlog

Formulate Game Concept

Generate Final Product Backlog

Game Design Document

Scrum Meeting

1 Week

Complete Sprint Tasks

Create Sprint

Game (Product)

Sprints!

Jungle Hunter: Product Backlog			
Req. ID	Requirement	Description	Progress
CH001	Character Movement	Character should b…	
CH002	Character Jump	Character should b…	
CH003	Character Interact	Character should b…	
CH004	Character Respawn	Character should b…	
EV001	Create Terrain	Generate t…	
EV002	Interactive Grass	Allow playe…	
AI001	Enemy field of view	Enemy should be able to s…	
…	…	…	…

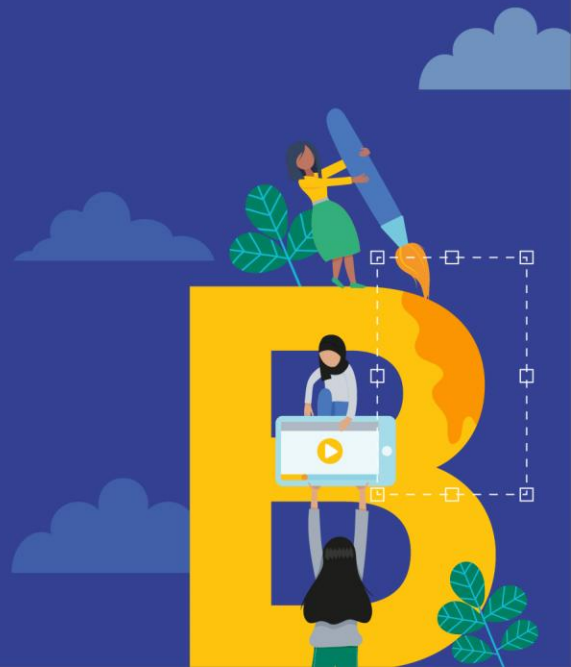
Sprints!

Jungle Hunter: Product Backlog

Req. ID	Requirement	Description	Progress
CH001	Character Movement	Character should b…	In Progress
CH002	Character Jump	Character should b…	
CH003	Character Interact	Character should b…	
CH004	Character Respawn	Character should b…	In Progress
EV001	Create Terrains	Generate t…	In Progress
EV002	Interactive Grass	Allow playe…	
AI001	Enemy field of view	Enemy should be able to s…	
…	…	…	…

Sprint 1: Basic Movement in Game World

Req. ID	Requirement	Member Responsible	Estimated Time
CH001	Character Movement	Ahmed	48 hours
CH004	Character Respawn	Sara	30 hours
EV001	Create Terrains	Mona	24 hours



Sprints!

Jungle Hunter: Product Backlog

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CH001	Character Movement	Character should b…	In Progress
CH002	Character Jump	Character should b…	
CH003	Character Interact	Character should b…	
CH004	Character Respawn	Character should b…	In Progress
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Sprint 1: Basic Movement in Game World

Req. ID	Requirement	Member Responsible	Estimated Time
CH001	Character Movement	Ahmed	48 hours
CH[illegible]4	Character Respawn	Sara	30 hours
EV0[illegible]1	Create Terrains	Mona	24 hours

Scrum Meeting in Progress

Sprints!

Jungle Hunter: Product Backlog

Req. ID	Requirement	Description	Progress
CH001	Character Movement	Character should b…	Done
CH002	Character Jump	Character should b…	
CH003	Character Interact	Character should b…	In Progress
CH004	Character Respawn	Character should b…	Done
EV001	Create Terrains	Generate t…	Done
EV002	Interactive Grass	Allow playe…	In Progress
AI001	Enemy field of view	Enemy should be able to s…	In Progress
…	…	…	…

Sprint 1: Basic Movement in Game World

Req. ID	Requirement	Member Responsible	Estimated Time
CH001	Character Movement	Ahmed	48 hours
CH004	Character Respawn	Sara	30 hours
EV001	Create Terrains	Mona	24 hours

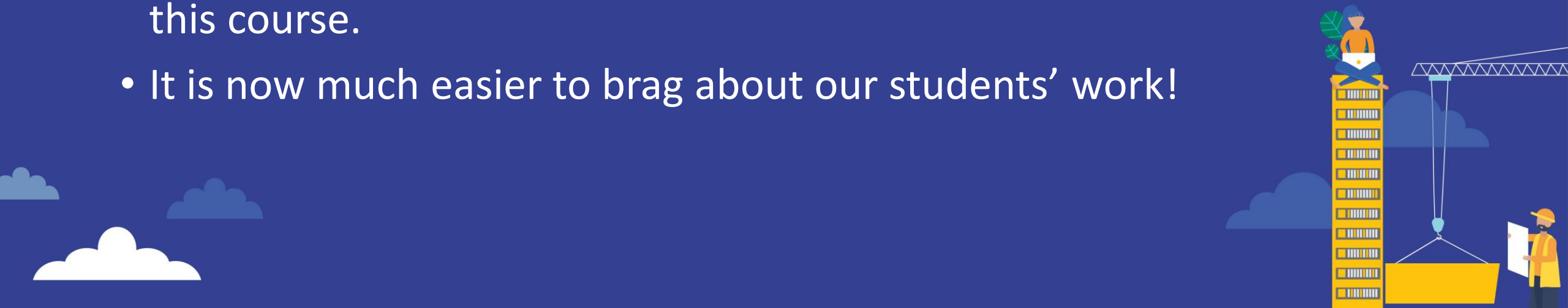
Sprint 2: Building Interaction

Req. ID	Requirement	Member Responsible	Estimated Time
CH003	Character Interact	Ahmed	24 hours
EV002	Interactive Grass	Mona	40 hours
AI001	Enemy field of view	Sara	72 hours

Why we like Scrum

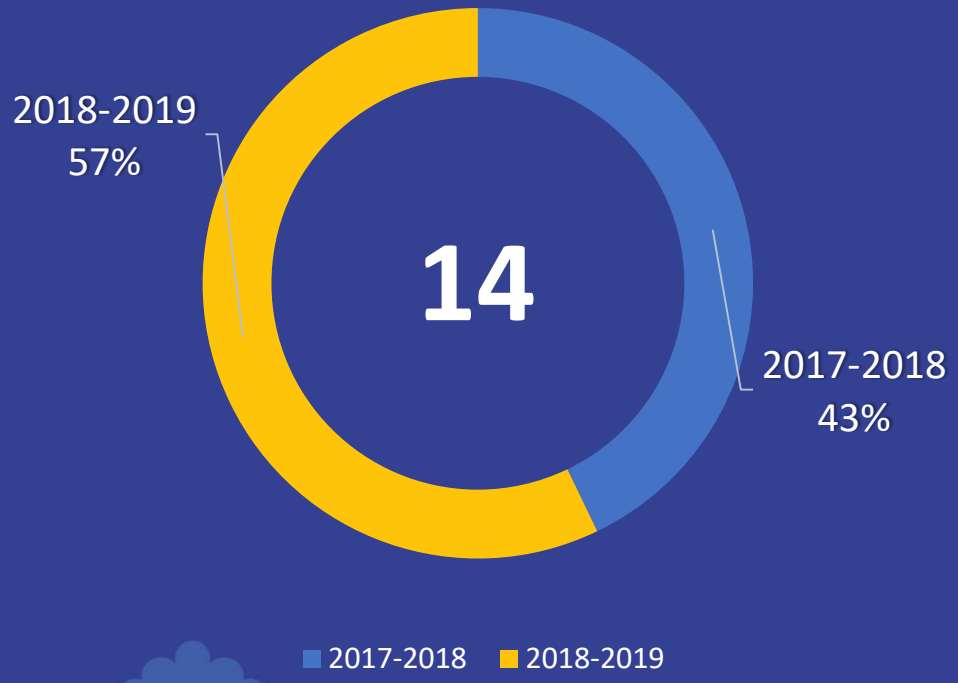
As tutors

- We can clearly see that the groups are much more organized now that the students follow Scrum.
- Being the students' Scrum Masters, we can rapidly spot and remedy any problem that may occur during development, keeping the students on track.
- Scrum has evidently improved the quality of the games produced in this course.
- It is now much easier to brag about our students' work!



What our students had to say

Student Responses
Academic Years 2017-2018 and 2018-2019



Average Students Satisfaction with the course

What our students had to say

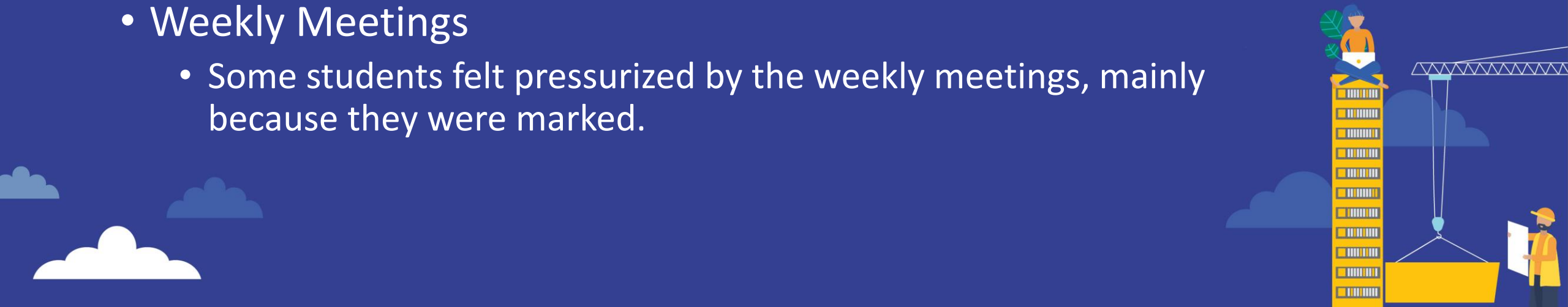
What they liked about the course

- Project Freedom
  - A number of students liked the freedom to choose their own set of features.
- Learn Based on Interest
  - Students pointed out that they were encouraged to self-learn new techniques because of the unique requirements they had set for their own projects.

What our students had to say

What they would change about the course

- Assets and Resources
  - As programmers, creating their own 3D assets was not an option. Students' found that the resources made available to them were not enough.
- Weekly Meetings
  - Some students felt pressurized by the weekly meetings, mainly because they were marked.



What our students had to say

When asked about Scrum in general

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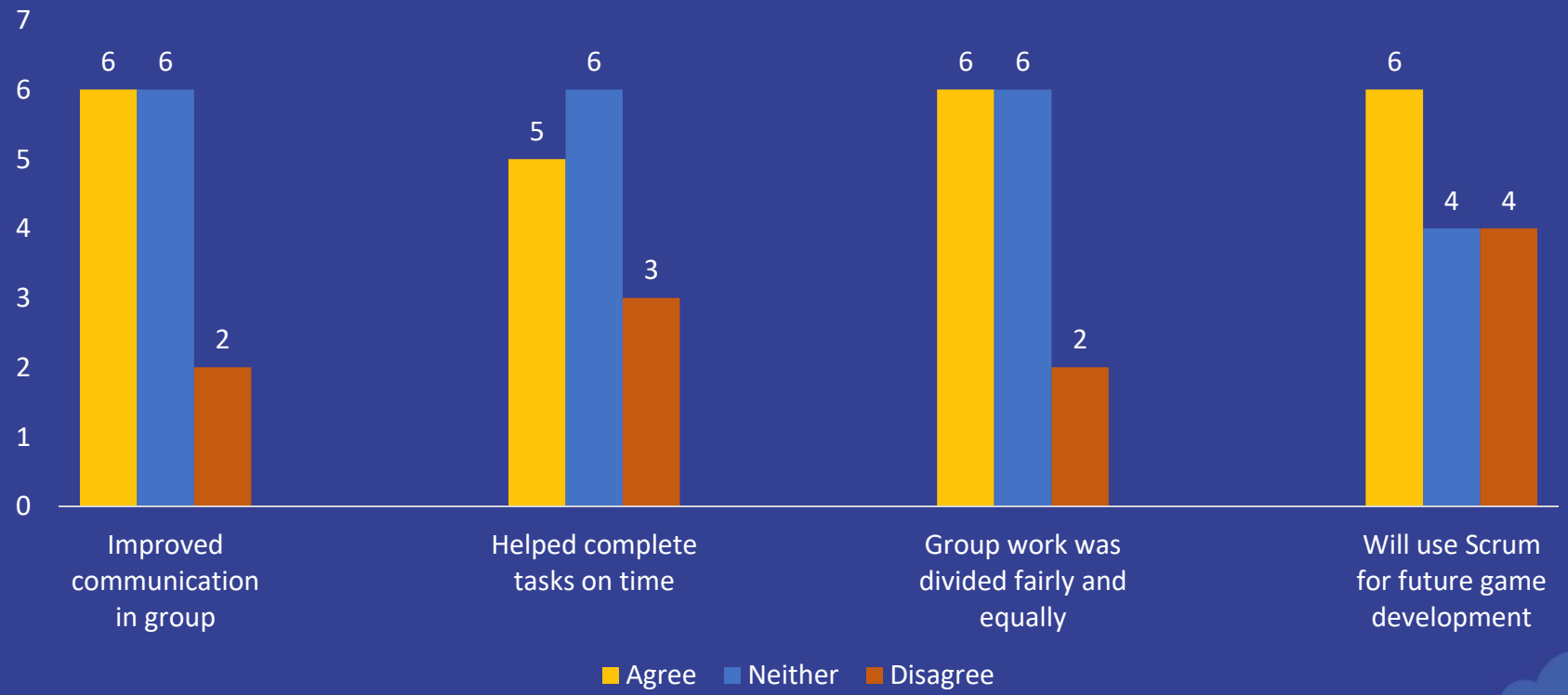
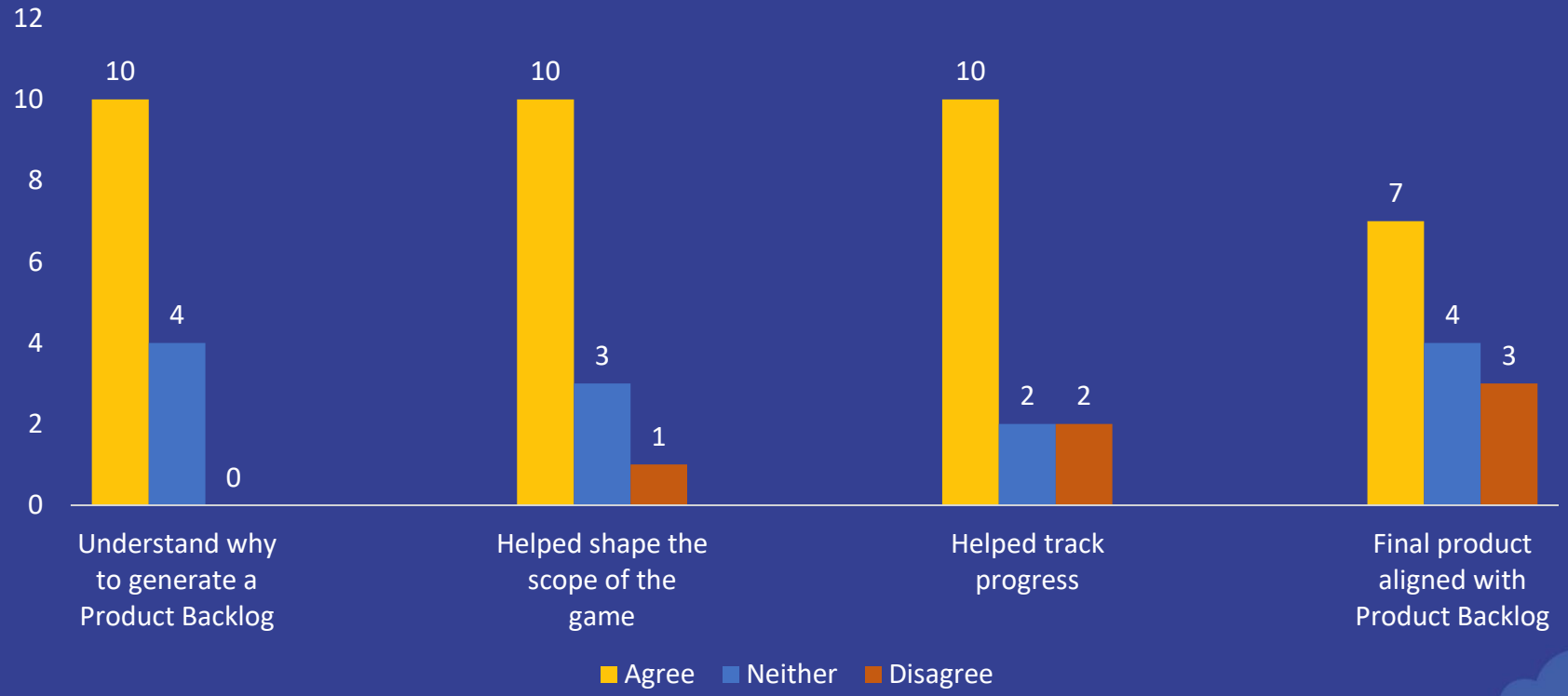


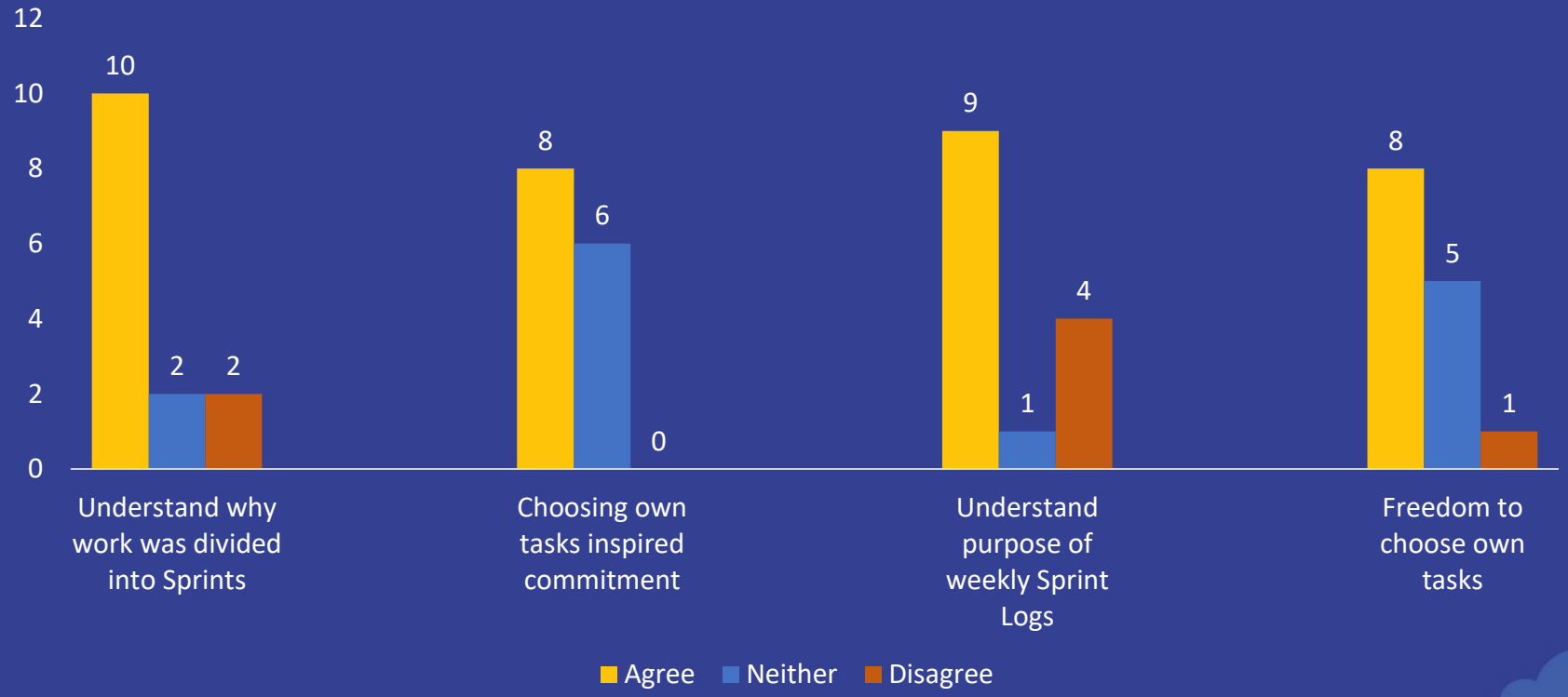
What our students had to say

When asked about the Product Backlog



What our students had to say

When asked about the Sprints



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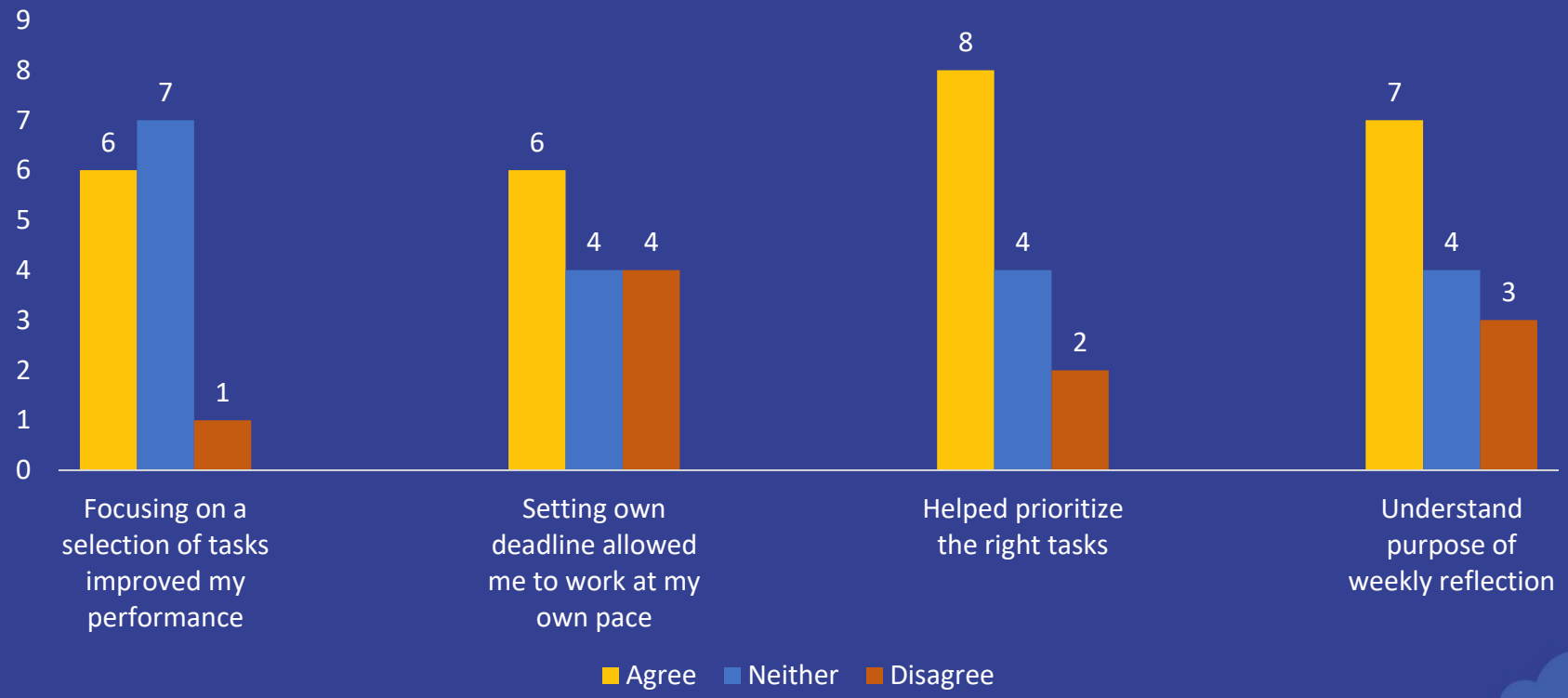
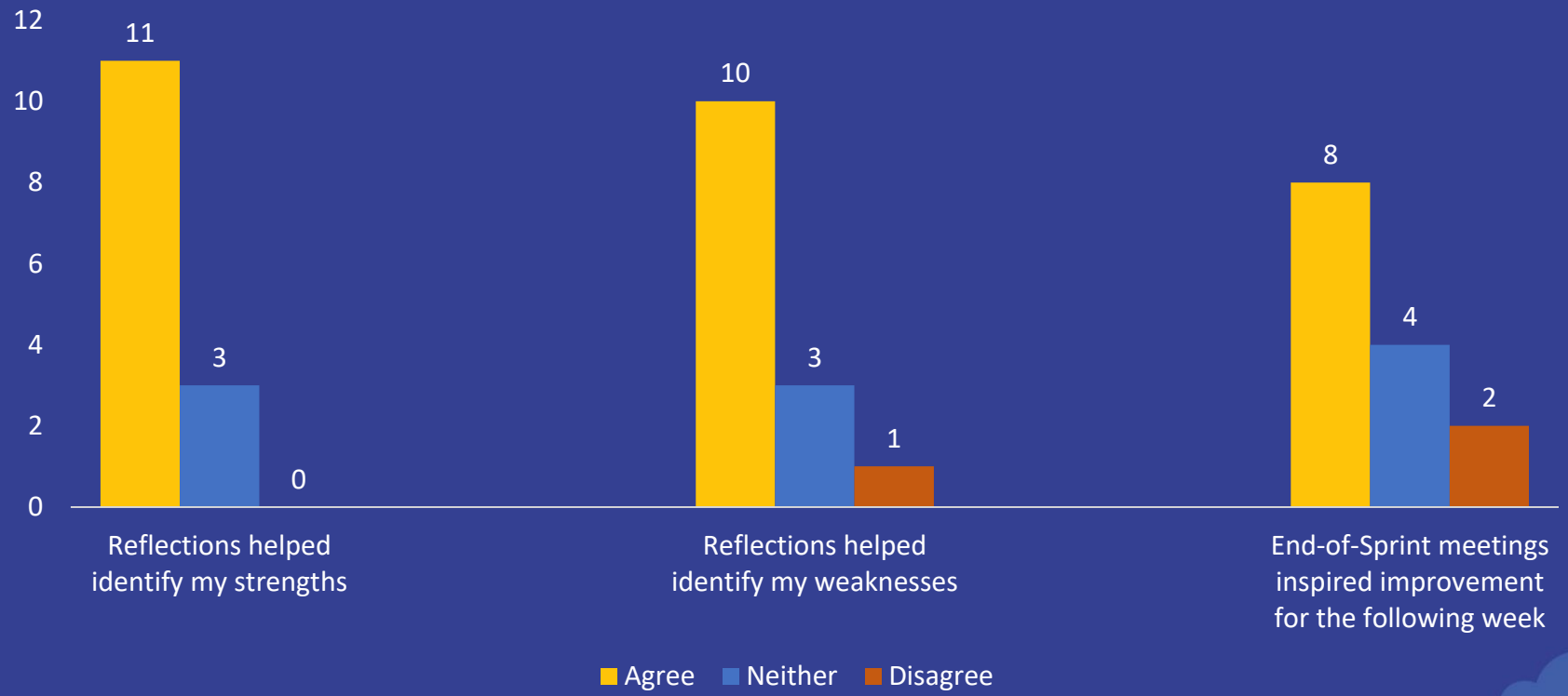


What our students had to say

When asked about the Sprints



What our students had to say

How Scrum benefitted the students

- Prioritization and Time Management
  - Students felt that Scrum enabled them to highlight the most important requirements and deliver them in due time.
- Documentation and Organization
  - Students pointed out “progress-tracking” as a selling-point for Scrum, thanks to the “visualization” of all requirements and their statuses.

What our students had to say

Room for Improvement?

- Automation and “more” Visualization
  - Students thought that utilizing any of the project management tools (e.g. Trello, Microsoft Project, etc.) can further enhance our implementation of Scrum.
- Deeper Involvement of Scrum Master
  - Students believed that “too much freedom” can sometimes lead to picking the wrong tasks to work on during a Sprint.

Students’ Sample Work

We like this part.

Students’ Sample Work

Video emitted due to large size

Thank you

We will now gladly take any questions

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