ERASMUS+ Project

SUSTAINABLE QUALITY ENHANCEMENT IN HIGHER EDUCATION LEARNING AND TEACHING. Integrative Core Dataset and Performance Data Analytics (Acronym: **SQELT**)

Key Action: Cooperation for innovation and the exchange of good practices / Action Type: Strategic Partnerships for higher education

SQELT ***EURO-REGION WORKSHOP UNITED KINGDOM***

Collecting and managing performance data on learning and teaching in higher education: performance indicators, learning analytics and data ethics

SAVE THE DATE – Thursday, 12th November 2020, 10.00 -11.30

Purpose:

Managing the data that universities collect in order to identify key performance indicators about learning and teaching is one of the most challenging issues we face in the sector. What data do we collect? Is the data we collect the right data? How do we collect such data? Is such data collected ethically? These are questions we ask in our Erasmus+ funded project *Sustainable Quality Enhancement in Higher Education Learning and Teaching* (SQELT), involving ten European partners and led by the German evaluation agency, evalag.

In this Webinar, we want to share our findings and experience from the SQELT project with a wider audience of experts and practitioners within the UK and gauge opinion on how to better manage performance data on the core work of higher education. Participants will reflect on the goals, functions and potentiality of performance data management in learning and teaching, including the use of performance indicators, the role of learning analytics and how to ensure data is collected ethically and properly protected.

Who should participate?

The webinar is primarily aimed at anyone in the UK who has an interest or specific role in the development of university performance data management processes, who help

to develop performance indicators and who help to manage quality in learning and teaching. We welcome participation by:

- institutional leaders;
- quality management staff;
- academic staff;
- students;
- quality assurance agencies, auditors and accreditors;
- HE researchers.

Presenters: James Williams, David Kane and Ron Austin (Birmingham City University)

Registration and participation: The webinar will take place on MS Teams. Please register by e-mailing James Williams at james.williams@bcu.ac.uk by 9th November 2020 and you will receive the MS Teams link.

Further information about the SQELT project from: James Williams (james.williams@bcu.ac.uk), David Kane (david.kane@bcu.ac.uk), or the coordinator of the Erasmus+ SQELT project, Prof. Dr. Dr. Theodor Leiber at: Evaluationsagentur Baden-Württemberg, M7 9a-10, D-68161 Mannheim, Germany or leiber@evalag.de

Project website: https://www.evalag.de/sqelt/

WEBINAR PROGRAMME

Time	Activity/Content	Presenter
10:00-10:10	**Registration, test and introductions**	**James Williams**
10:10-10:30	**Sustainable Quality Enhancement in Higher Education Learning and Teaching: Introduction to the SQELT project**	**David Kane**
10:30-11:00	**Pathways to a Successful Student Learning Journey**	**Ron Austin**
11:00-11-20	**Data Ethics and its challenges: open discussion**	**Led by James Williams & David Kane**
11:20-11:30	**Conclusions**	**James Williams**

Co-funded by the Erasmus+ Programme of the European Union

Sustainable Quality Enhancement in Higher Education Learning and Teaching

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Grant co-funded by European Union (Erasmus+ Projects)
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Main objective of the project: Development of Innovation

Multiplier Event – Euro-Region Workshop UK

BCU, 12 November 2020

BIRMINGHAM CITY University

SQELT: Project Aim

The SQELT project aims to establish a comprehensive L&T core dataset (LTCD) for assessing HEIs' performance quality in L&T.

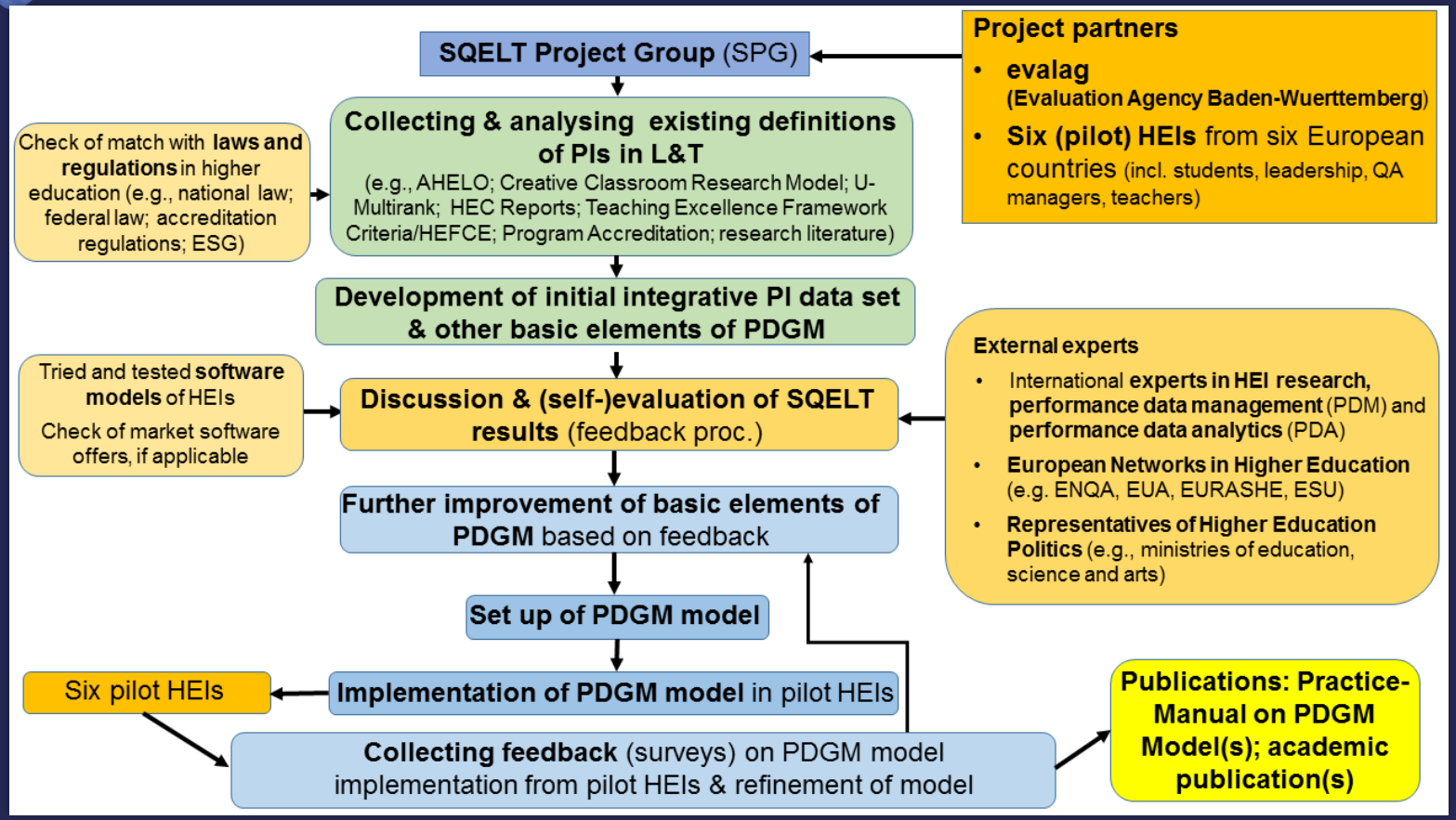
The LTCD will include generic core data relevant to any HEI. The LTCD will be part of a toolbox from which HEIs can select 'individual' performance data according to their specific strategic profile, mission and vision. The project will also attempt to identify related performance indicators.

The integrative LTCD will be prepared for use in Digital Performance Data Management (DPDM), in particular Learning Analytics and will include an ethical code of practice.

Project Partners

- Austria – Danube University, Krems
- Belgium – Ghent University
- Germany – Evalag (Evaluation Agency Baden Wurttemberg)
- Italy – University of Milan
- Poland – Jagiellonian University
- Portugal – University of Aveiro
- United Kingdom – Birmingham City University (BCU)
- External Experts: University of Leiden, University of Oslo and CIPES Portugal

SQELT Project: Workflow



Context: What are PIs?

'PIs can be defined as concepts that represent **qualitative and quantitative** information and data, which **indicate** functional qualities ('performance') of institutional, organisational or individual performance providers. As such, PIs provide information about the degree to which quality performance objectives [can be or] are being met. This modelling perspective seems to be indispensable for any systematic approach to QM, particularly development-oriented QM in HEIs' (Leiber, 2019b, 77).

- PIs are **(only) indicating** aspects about their related performance; PIs are **not "complete or perfect images"** of their related performance
- 'PIs reflect the quality goals ('targeted performance') of institutions, institutional units and programmes' (Leiber 2019b, 77), in more direct or more indirect ways
- PIs can 'open the way to objectify communication and operationalisation of quality relevant features and, in the case of quantitative PIs, measure them' (Leiber 2019b, 77)

Anecdotal opinions & ‘misunderstandings‘ about PIs in higher education L&T

- Unclear/vague/diverse concepts of: quality, performance, indicator, learning, teaching, etc.
- Unclear or questionable whether PIs relate to and/or adequately address the degree to which quality performance objectives [can be or] are being met
- Unclear how PIs are/can be measured
- Related: “There are hundreds of L&T theories”
- (Tacit) Assumption that isolated PIs are sufficient for evidence-informed decision-making
- (Tacit) Assumption that a few core PIs suffice for decision-making and governance
- No overview available in the form of a comprehensive PI set
- PIs are quantitative PIs only
- Assumption that performance measurement issues can be communicated within 1:30 min

Institutional Case Studies

- Literature analysis and review
- Document Analysis
- Focus Groups/Structure Interviews
  - Students, Teachers, Leadership, QM staff

Purpose

- Two main goals: **individual benchlearning** at partner HEIs & **intensive case study** including **generic results** (e.g. SQELT Manual; publications)
- Aims at **comprehensive set of performance indicators** (PIs) **for L&T** and their **PDGM framework** - comprehensive: of large scope; inclusive; thorough; far-reaching; broad; widespread; detailed; cross-disciplinary; all of which are different from "perfect"!
- Builds on **available scholarly models of PDGM in L&T**, **research literature** and **external experts**' knowledge
- Builds on **various PI models** (e.g. AHELO; Creative Classroom Research Model (Uni Leuven); **U Multirank**; HEC Reports; TEF/HEFCE; Program Accreditation; **NSSE Engagement Indicators**; **QILT** (Australian Quality Indicators for L&T)

Purpose (2)

Dimensions of benchlearning objective:

- Performance data governance & management (**PDGM**) policy
- **Stakeholder participation** (SP)
- **Performance indicators** (**PIs**), quantitative & qualitative, of various complexity
- **Learning Analytics**
- **IT** resources and software solutions
- Human and financial **resources**
- **Ethics** of PDGM

→ **SWOTs of PDGM & their Strategy Matrices – important for Strategic Partnership, Benchlearning & Joint Development of PDGM Approach(es) –**

BCU: Case Study Summary

- Core data – statutory requirements/NSS and TEF requirements;
- Quality of data – varies;
- Several systems running concurrently – no connection;
- Dashboards – tends to be ‘static’ data;
- Leadership – silo working/ pockets of good practice; need for institutional leadership;
- Currently developing Learning Analytics framework from ground up.

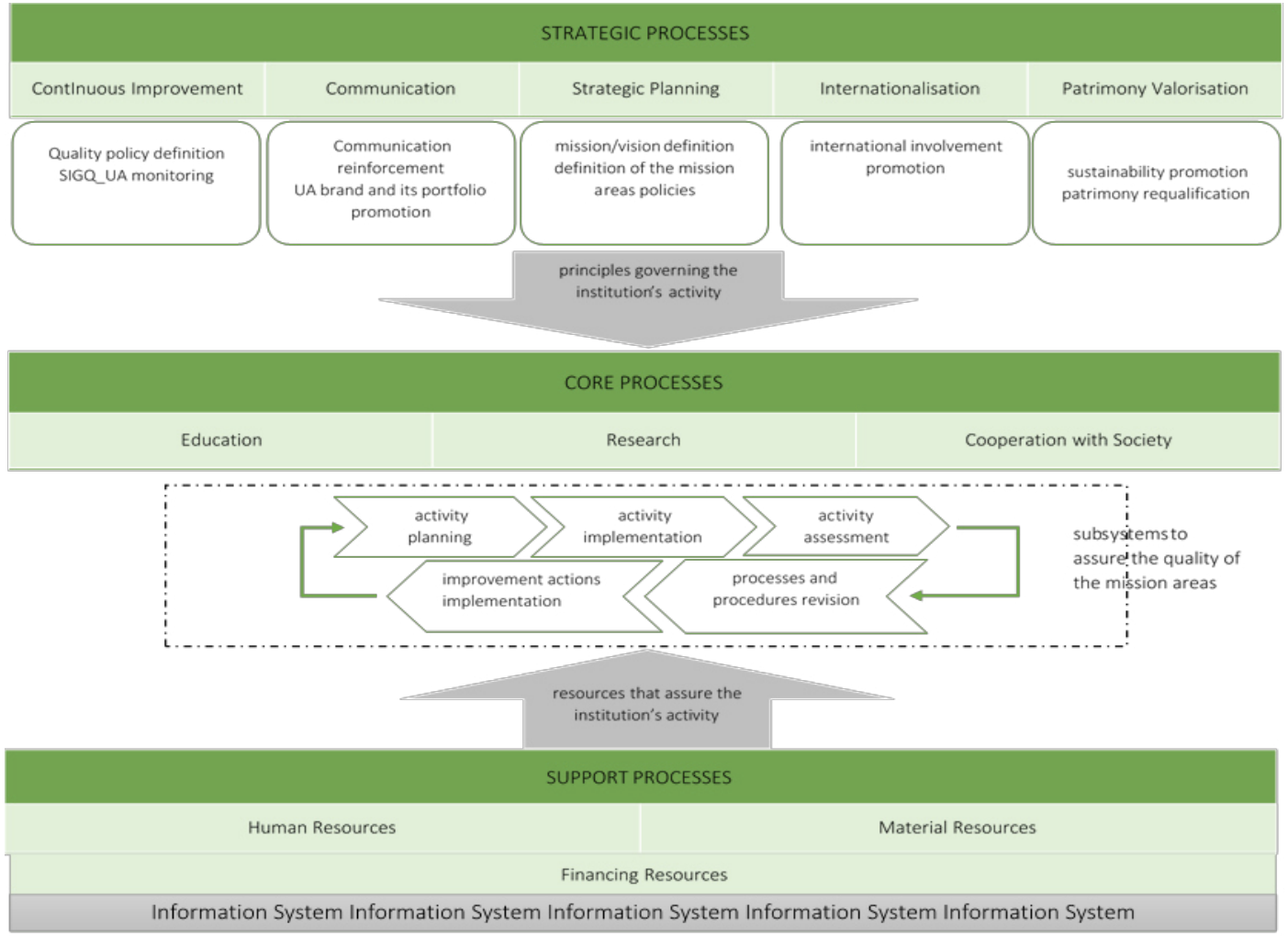
University of Aveiro: a Model

- **1973**: UA founded
- Since **1997**: **Implementation of an internal QA system** (SIGQ_UA – Sistema Interno de Garantia de Qualidade); gives consistency and coherence to the set of actions the UA is developing
- **1997**: creation of **Vice-Rectory for Quality**: strategic goal to fulfil the institutional policy for the assurance of the established quality and its continued enhancement in the various core mission areas, in line with national and European quality benchmarks in higher education
- **2009**: UA became a Foundation, introduced a **new management model** and clearly assumed **QA as one of the institution's strategic vectors**

L&T Quality Assurance at the University of Aveiro

Three **interconnected** levels: **strategic**, **core** and **support** processes

- **Integrate the quality component in the institution's own activity**:
- SIGQ_UA is run and managed within the existent decision-making bodies and services of the UA – no specific bodies or units responsible for managing and running SIGQ_UA have been created (although tasks, responsibilities and resources of individuals and bodies have been defined)



L&T Quality Assurance at the University of Aveiro

UA's institutional strategy comprises:

- Commitment to the permanent consolidation of the quality of the educational offer
- Paying special attention to the needs of society and the job market
- …and the processes of formal accreditation
- ..and the academic success and social well-being of its students.
- **Vice-Rectors with responsibilities for educational matters**
- Doctoral School, which coordinates activities in the 3rd cycle
- A **Pro-Rector with specific competences for the evaluation and accreditation** of study cycles

L&T Quality Assurance at the University of Aveiro (2)

In the creation and revision of study cycles, the participation of internal and external stakeholders is guaranteed through:

- the Scientific Council (SC)
- the Pedagogic Council (PC)
- the Council of Organic Unit (OUC)
- the Self Evaluation Committee
- Consultation with external partners (e.g. businesses, local authorities, schools, HEIs)

L&T Quality Assurance at the University of Aveiro (3)

Used in these processes (monitoring, revising, creating and closing study cycles):

- **Indicators** of attractiveness, student success and satisfaction, employability
- Results of the Quality Assurance Subsystem_**course** (**SubGQ_UC**) and the Quality Assurance Subsystem_**study cycle** (**SubGQ_curso**), generated every semester
- Results of **self-evaluation** and of **external evaluation**/**accreditation**, occurring periodically,

University of Aveiro – SWOT Analysis: Strengths

- A consolidated **QA sub-system for the course units** (SubGQ_UC), which is recognised and appropriate for the institution;
- A consolidated **Information System** (SIUA), with a high level of maturity, capable of providing an adequate response to the demands of the **L&T internal QA** system;
- A **Data Portal** with essential information for the **management and decision-making**;
- An **Information System developed using the skills and knowledge of the personnel** at UA, which permits it to grow and adapt itself to the specificities of the institution.

University of Aveiro – SWOT Analysis: Weaknesses

- **Not all the data** that could be **relevant** for L&T quality improvement **is collected** and/or **treated**;
- Some **interesting PIs** are **not yet incorporated** in the Data Portal;
- Some of the subsystems which constitute the UA Information System need to be reviewed in order **to improve factors of usability, accessibility and the quality of information search**;
- **Some relevant data and PIs are still not available** to the UA **community** at large.

University of Aveiro – SWOT Analysis: Opportunities

- The institutional capacity to change (by adapting the information systems to current technological trends and greater involvement of users in the design and validation processes of the improvements to be implemented);
- Favourable climate for the consolidation of the internal QA system and the broadening of the procedures of performance analysis;
- The degree of maturity and consolidation of the SubGQ_UC which contributes to reinforce the actors' involvement;
- Participation in international rankings and research projects (e.g. SQELT).

University of Aveiro – SWOT Analysis: Threats

- The monitoring of performance quality **centred on multiple numerical data** may lead to an excessive and not necessarily positive quantitative analysis regarding the measurement of L&T quality;
- The danger of not being able to **adequately relate the PIs with the real functioning** of the institution.

University of Aveiro – SWOT Analysis: Future Outlook

UA attempts to gain knowledge and information relevant for the improvement of its PDM model regarding the following aspects:

- **Identification of the most important data** to be collected and **PIs** to be developed for adequately assuring and improving the quality of L&T;
- How to **assure** that the **data** collected (and the PIs defined based on it) is **accurate**, **consistent** and **kept secure** within the UA;
- **How to decide on who** in the institution **should have access** to the existent data and PIs and **for what purposes**; (ethical behaviour; competences; confidence)

University of Aveiro – SWOT Analysis: Future Outlook (2)

UA attempts to gain knowledge and information relevant for the improvement of the following aspects of its PDM model:

- How to **improve internal actors' capabilities to analyse and interpret the existent data** and **PIs** so they can actually be used to **support decision-making** and contribute to quality improvement;
- How to implement an **effective learning analytics system**, able to understand and optimize learning in the University, as well as the environment in which it occurs.

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Pathways to a Successful Student Learning Journey

Ron Austin

Problem definition

- **Since the introduction of fee to higher education there has also been an increase in student expectation for good outcomes from the degree programmes. Most of the current research has been reviewing quality of teaching and learning, however can we demonstrate to the student the progress that they are achieving within their studies?**
- **Providing more near time/real time data to students and staff on attendance and interactions with the university systems.**

Research Aims

- **What are the factors that lead to a student being academically successful?**
- **How do we (the university) monitor and use this information**
- **What support mechanisms are required to support students on the learning journey?**
- **Can Learning Analytics aid student engagement**

Research Questions

- **What data is available to monitor students leaning journey and engagement with the learning process.**
- **What data provides the clearest indication of student success within the learning journey.**
- **How do we then enhance the students learning from the data obtained?**

Methodology

- **The methodology that has been chosen within this research project is grounded on the positivists' paradigm to research; therefore, the research will be empirical rather than a pure research. There is a degree of naturalistic research embedded as this will provide the wider view, where the research will be partially constructivist (Iivari et al. 1998).**

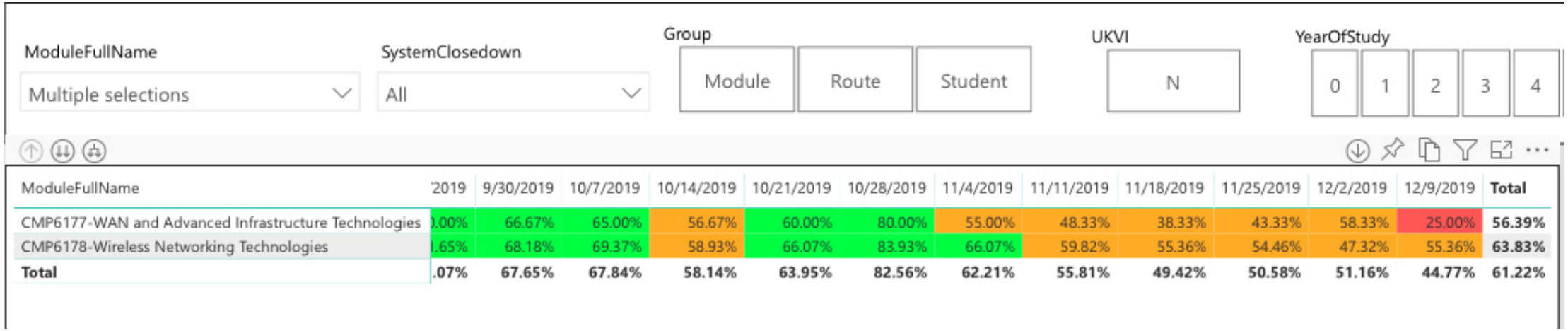
Data Sources

- **Within the university we have a number of data sources that can be used to map the students usage of the systems:**
- **Moodle – University Virtual Learning Environment**
- **Gate Data – Are the students attending – Challenging with Covid-19**
- **Term Time – University Attendance Monitoring system of on site tutorial sessions**
- **Active Directory – Are the students logging into the systems**

Attendance Data – October and November 19

CourseFullName	9/30/2019	10/7/2019	10/14/2019	10/21/2019	10/28/2019	11/4/2019	11/11/2019	11/18/2019	11/25/2019	Total
US0669S-BSc (Hons) Computer Networks with SW	72.92%	75.00%	84.29%	89.86%	76.39%	93.33%	98.33%	83.33%	56.67%	**81.31%**
US0669F-BSc (Hons) Computer Networks with FY	84.38%	90.00%	82.50%	80.00%	82.50%	85.00%	77.50%	67.50%	57.50%	**78.41%**
US0667S-BSc (Hons) Computer Games Technology with SW	100.00%	83.33%	83.33%	91.67%	75.00%	75.00%	66.67%	75.00%	50.00%	**76.47%**
PT0960-MSc Cyber Security	78.57%	53.85%	93.75%	43.75%	87.50%	68.75%	81.25%	93.75%	75.00%	**75.54%**
US0677S-BSc (Hons) Computer Forensics with SW	93.75%	87.18%	92.31%	94.87%	82.50%	76.60%	59.57%	70.83%	35.42%	**74.38%**
PT0959-MSc Cyber Security	76.83%	60.24%	80.22%	65.96%	84.04%	75.53%	64.89%	68.09%	67.02%	**71.46%**
US0667-BSc (Hons) Computer Games Technology	84.94%	75.79%	74.34%	62.73%	70.94%	71.99%	68.65%	51.30%	62.18%	**68.58%**
US0937F-BSc (Hons) Cyber Security with FY	68.26%	79.34%	77.73%	67.54%	66.23%	91.30%	73.04%	57.39%	35.65%	**68.37%**
US0671F-BSc (Hons) Computer Networks and Security with FY	76.92%	78.79%	65.15%	72.73%	56.06%	92.42%	71.21%	53.03%	36.36%	**66.72%**
US0675F-BSc (Hons) Computer Science with FY	74.51%	65.50%	75.41%	65.51%	65.51%	83.11%	70.32%	51.21%	34.76%	**64.72%**
US0675S-BSc (Hons) Computer Science with SW	80.77%	78.85%	68.27%	72.12%	73.08%	56.73%	53.85%	47.12%	50.96%	**64.64%**
US0671S-BSc (Hons) Computer Networks and Security with SW	61.90%	58.93%	61.02%	70.49%	56.25%	66.67%	67.39%	54.35%	50.00%	**60.86%**
UM0041-MSci Computer Networks and Security	82.35%	75.00%	70.31%	51.56%	70.00%	58.57%	51.43%	38.57%	58.57%	**60.42%**
US0671-BSc (Hons) Computer Networks and Security	77.91%	68.37%	63.86%	59.08%	70.65%	54.92%	51.45%	52.01%	52.46%	**60.26%**
US0677-BSc (Hons) Computer Forensics	72.73%	77.78%	78.14%	57.36%	60.66%	51.20%	41.30%	45.03%	41.06%	**57.74%**
US0669-BSc (Hons) Computer Networks	65.26%	61.27%	66.98%	53.33%	66.57%	53.61%	56.02%	46.08%	41.87%	**56.28%**
US0677F-BSc (Hons) Computer Forensics with FY	50.72%	55.95%	58.33%	46.43%	46.43%	95.24%	70.24%	45.24%	27.38%	**55.20%**
UM0040-MSci Computer Networks	86.96%	65.85%	70.73%	43.90%	55.56%	53.33%	42.22%	42.22%	51.11%	**54.99%**
US0675-BSc (Hons) Computer Science	71.30%	58.46%	66.84%	56.25%	57.80%	55.66%	49.54%	43.37%	38.21%	**54.82%**
US0937-BSc (Hons) Cyber Security with FY	70.31%	63.79%	65.34%	47.66%	39.49%	45.82%	45.32%	30.89%	33.67%	**48.31%**
UM0044-MSci Cyber Security	66.67%	59.26%	37.04%	28.13%	27.78%	34.38%	37.50%	28.13%	37.50%	**38.01%**
Total	**73.32%**	**66.11%**	**69.19%**	**58.89%**	**62.18%**	**61.30%**	**55.17%**	**47.52%**	**43.47%**	**59.15%**

Attendance Data - Modules



ModuleFullName	'2019	9/30/2019	10/7/2019	10/14/2019	10/21/2019	10/28/2019	11/4/2019	11/11/2019	11/18/2019	11/25/2019	12/2/2019	12/9/2019	Total
CMP6177-WAN and Advanced Infrastructure Technologies	.00%	66.67%	65.00%	56.67%	60.00%	80.00%	55.00%	48.33%	38.33%	43.33%	58.33%	25.00%	56.39%
CMP6178-Wireless Networking Technologies	.65%	68.18%	69.37%	58.93%	66.07%	83.93%	66.07%	59.82%	55.36%	54.46%	47.32%	55.36%	63.83%
Total	**.07%**	**67.65%**	**67.84%**	**58.14%**	**63.95%**	**82.56%**	**62.21%**	**55.81%**	**49.42%**	**50.58%**	**51.16%**	**44.77%**	**61.22%**

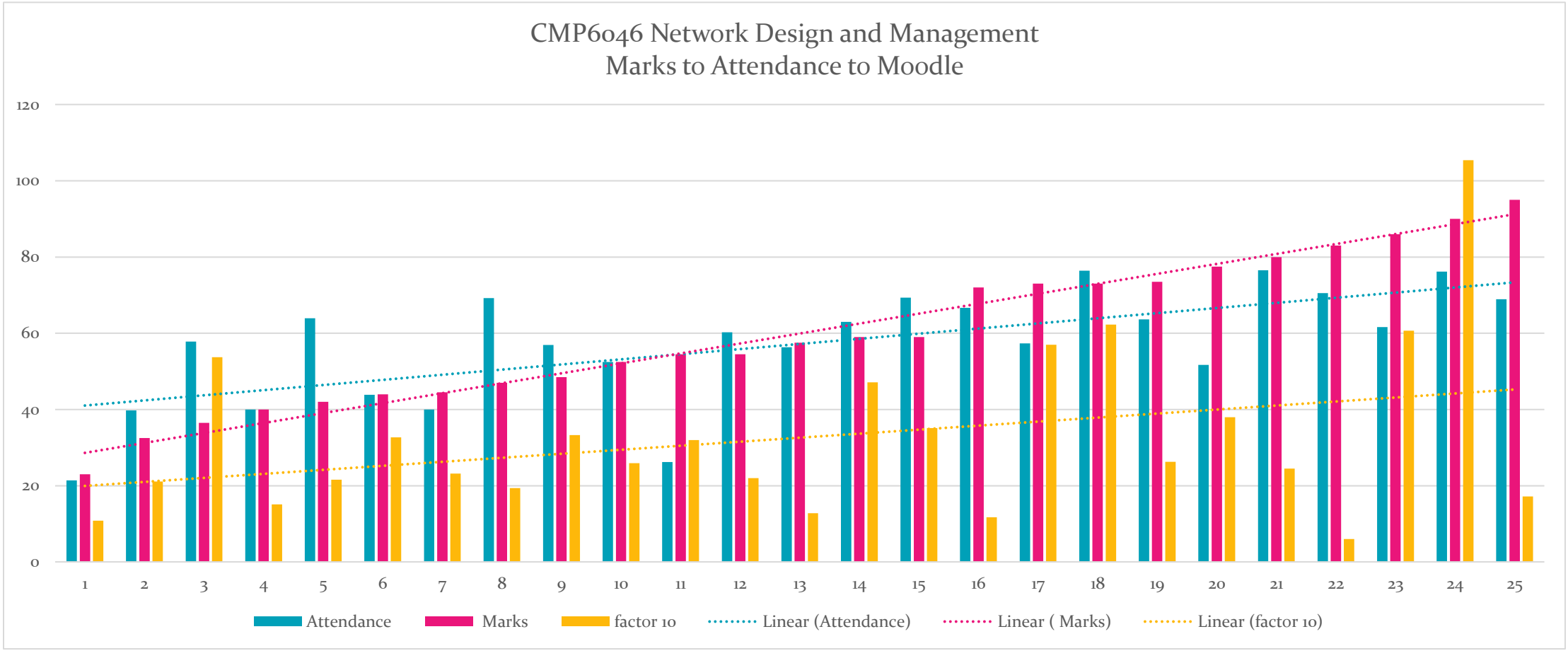
Attendance Data – Mapping Actual/Expected

WeekName	10/14/2019		10/21/2019		10/28/2019		11/4/2019		11/11/2019		11/18/2019		11/25/2019		Total	
CourseFullName	pected	Actual	Expected	Actual	Expected	Actual	Expected	Actual	Expected	Actual	Expected	Actual	Expected	Actual	**Expected**	**Actual**
PT0959-MSc Cyber Security	91	73	94	61	94	73	94	69	94	61	94	64	94	63	**820**	**577**
PT0960-MSc Cyber Security	16	15	16	7	16	12	16	11	16	13	16	15	16	12	**139**	**103**
UM0040-MSci Computer Networks	41	27	41	18	45	21	45	12	45	15	45	19	45	15	**371**	**170**
UM0041-MSci Computer Networks and Security	64	43	64	33	70	39	70	23	70	30	70	27	70	29	**576**	**296**
UM0044-MSci Cyber Security	27	7	32	9	36	10	32	11	32	8	32	9	32	12	**271**	**89**
US0667-BSc (Hons) Computer Games Technology	378	260	381	237	382	270	382	253	386	262	386	196	386	209	**3320**	**2175**
US0667S-BSc (Hons) Computer Games Technology with SW	12	5	12	11	12	9	12	6	12	7	12	9	12	6	**102**	**65**
US0669-BSc (Hons) Computer Networks	315	189	315	168	332	204	332	127	332	169	332	152	332	104	**2795**	**1386**
US0669F-BSc (Hons) Computer Networks with FY	40	21	40	28	40	28	40	14	40	18	40	22	40	22	**352**	**200**
US0669S-BSc (Hons) Computer Networks with SW	70	59	69	62	72	55	60	56	60	59	60	50	60	34	**567**	**461**
US0671-BSc (Hons) Computer Networks and Security	844	499	848	499	896	549	894	340	894	406	894	461	894	373	**7493**	**4016**
US0671F-BSc (Hons) Computer Networks and Security with FY	66	24	66	38	66	24	66	7	66	13	66	19	66	21	**580**	**213**
US0671S-BSc (Hons) Computer Networks and Security with SW	59	36	61	43	64	36	45	30	46	31	46	25	46	21	**465**	**281**
US0675-BSc (Hons) Computer Science	1725	1046	1744	981	1744	942	1748	751	1750	774	1750	759	1756	671	**15261**	**7620**
US0675F-BSc (Hons) Computer Science with FY	370	179	374	199	374	172	373	33	374	99	373	122	374	115	**3209**	**1218**
US0675S-BSc (Hons) Computer Science with SW	104	71	104	75	104	76	104	59	104	56	104	49	104	53	**936**	**605**
US0677-BSc (Hons) Computer Forensics	334	240	333	188	333	201	334	171	339	115	342	147	341	125	**2920**	**1549**
US0677F-BSc (Hons) Computer Forensics with FY	84	24	84	24	84	22	84	8	84	15	84	17	84	18	**741**	**176**
US0677S-BSc (Hons) Computer Forensics with SW	39	35	39	37	40	32	47	36	47	27	48	33	48	17	**363**	**266**
US0937-BSc (Hons) Cyber Security with FY	378	190	384	183	428	169	395	181	395	140	395	122	395	133	**3438**	**1435**
US0937F-BSc (Hons) Cyber Security with FY	220	107	228	117	231	112	230	28	230	50	230	78	230	71	**1979**	**765**
Total	**5277**	**3150**	**5329**	**3018**	**5463**	**3056**	**5403**	**2226**	**5416**	**2368**	**5419**	**2395**	**5425**	**2124**	**46698**	**23666**

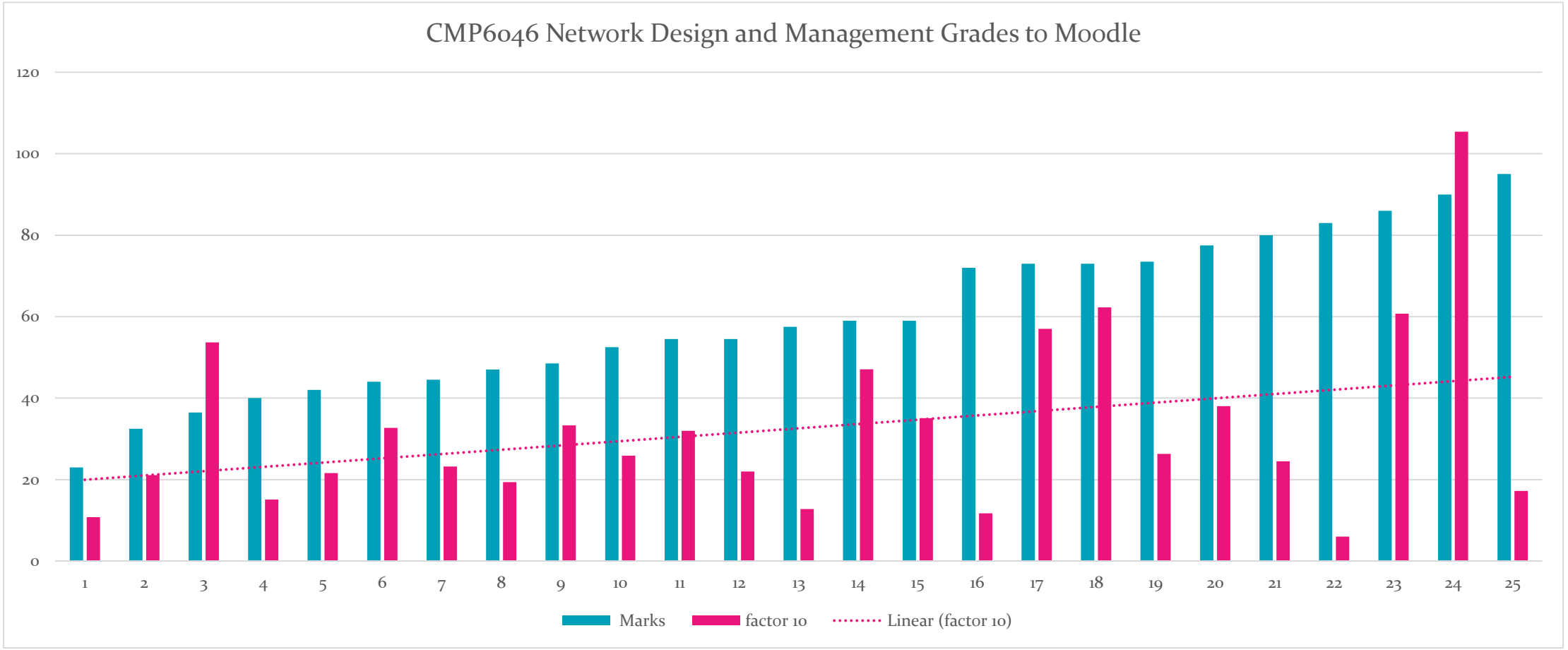
Attendance Data – Students data

Month_Name		September 2019				October 2019				November 2019			
StudentId	ount	Attended	Expected	Door Access Count	Moodle Activity Count	Attended	Expected	Door Access Count	Moodle Activity Count	Attended	Expected	Door Access Count	Moodle Activity (
18114551	33	6	11	11	181	21	35	61	502	11	38	43	
18116820	31	9	11	17	240	17	35	52	666	15	38	25	
18122065	51	4	8	6	39	13	39	14	527	4	42	24	
18123205	31	9	11	23	141	23	35	95	697	20	38	61	
18128410	47	9	11	18	320	28	35	117	1358	21	38	89	
18153827	20	7	11	23	183	24	35	129	658	15	38	93	

Results – Grades, Attendance and Moodle



Results – Grades to Moodle interactions



Further work

- Future work will need to be undertaken to investigate the types of interactions the students may have with the virtual learning environment. That is to say that each resource within Moodle may need to be given a weight based on importance to the module. This approach links to Bernstein's elaborated code or specialized voice. Table 2 shows an example of the weighting for each resource within Moodle.

Logins	Lecturer PPTs	Videos	Quiz – Formative	Practice Exam
1	5	5	10	3

Points to note

- One student with a high attendance of 100% and a low grade 25% was reviewed in detail. I reviewed the students' interactions with the virtual learning environment it can be seen that the student has only accessed the practice examination questions 152 times out of a total of 484 interactions with the virtual learning environment, this is 31% of the students' time on the system.
- As a comparison the student with an attendance at 74% and a grade of 90% interacted with Moodle over 1000 times and only reviewed the practice examination 183 times or 17% of their time on the virtual learning environment.