Comparative Analysis on Features Supporting Students' Self-Regulation in Three Different Online Learning Platforms

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Abstract. The paper discusses results of a survey focusing on student expectations and experiences on learning analytics and tools used for supporting self-regulation. The students participating in the survey were from three different organisations and they were also users of three different learning platforms. The results show differences between the students' self-efficacy levels and identified tools and pedagogical solutions in each platform. The paper also discusses students' preferences and need for learning analytics dashboards and peer comparisons as well as their potential for functioning as supporting measures for self-regulation.

Keywords: Learning Analytics, Self-Regulation, Learning Platforms

1 Introduction

Learning analytics is typically used for designing learning from the point of view teachers, academic advisors or other administrators of an educational organization. It often focuses on identifying and monitoring possible drop-outs through certain indicators, or it is used to map the study paths to find the challenging points which call for redesign of the online course. The perspective for applying tools of learning analytics has been mainly administrative [1]. To make it clear, in this article learning analytics is viewed as the process of gathering data about student activities and efforts in a digital learning environment, interpreting the collected data and producing reports and analysis based on the data to the users of the digital learning platforms [2], [3].

A lot of In-built learning analytics tools have been developed in the digital learning platforms for the purpose of reducing teachers' manual work, to collect acts of learning into countable units (such as clicks, views and time used) which can be reported to the platform users. Data mining connected with learning analytics usually utilizes system logs (such as time and number of logins), the amount and duration of views per document or links offered as study materials, the amount of forum posts, assignment submissions and test attempts. The tools used for analyzing learning vary in digital learning platforms. In general, student dashboards, progression tracking tools, test and questionnaire tools, gradebooks or grading views and course overview repots offer organized

information about the learner's actions. For teachers the platforms usually offer a wider range of reports based on logs.

Learning analytics may help teachers design better online courses, but the collected data must be relevant. It has been suggested that in order to collect meaningful data in an online course, teachers need to incorporate certain pedagogical elements which produce digital footprints in the learning process [4]. These elements can be constructed using the different tools or activities in the digital learning platforms. In this article a learning analytics tool means any kind of activity or method for collecting the users' data and presenting it to them. These tools may be automated (the platform collects and organizes the data) or manual (the teacher collects and organizes the data), or both. A combination of manual and automated learning analytics is for example a grading table in which a teacher adds a manually graded assignment.

A well-made online course design that consistently collects digital footprints of the learners' actions may help teachers in offering timely support and feedback, but does the collected data really benefit students directly? Do the designed pedagogical elements and measures of collecting data enhance student self-regulation or motivation? What kind of data about the learning process would be useful or meaningful to the students? Learning analytics may play a role on a metacognitive level, for example by directing students into using better learning strategies, developing self-regulatory skills or improving their emotional and cognitive awareness of themselves as learners.

These issues were explored in the MOPPA project (Motivation och självreglering på inlärningsplatta med hjälp av inlärningsanalytik) funded by the Swedish Cultural Foundation in Finland. Three educational institutes in Finland participated in a comparative survey focusing on mapping the students' needs and experiences on using digital learning platforms during online or blended learning courses. The participating institutes were Haaga-Helia University of Applied Sciences, Prakticum, and Axxell Utbildning. Haaga-Helia is a Finnish-speaking higher educational institute while the latter two are Swedish-speaking vocational upper secondary schools. All three organizations have different digital learning platforms: Haaga-Helia uses Moodle, Axxell has ItsLearning and Prakticum operates on Google Classroom (G Suite for Education, henceforth also GC). Therefore, the responses from each organisation were viewed separately in comparison with each other to find out if there are any differences concerning student experiences with the platforms. Some categorizations were made within all respondents to be able to highlight overall trends but mostly this paper concentrates on the comparative discussion of the survey responses to the structured questions. The views which emerged in the open-ended questions and interviews have been discussed further in the proceedings of the 13th International Conference on Computer Supported Education and they are addressed only briefly here. This paper extends the analysis with a closer look at students' self-efficacy and the identified learning analytics tools on three different online learning platforms.

2 The Survey Framework and Participants

The survey was conducted between November 2020 and February 2021. It was followed by semi-structured student interviews with seven volunteer respondents. The amount of survey respondents was 93, of which 47 were from Haaga-Helia, 34 from Axxell and only 12 from Practicum. The interviewed focus group participants were only from Haaga-Helia.

The questionnaire contained 25 questions, consisting of multiple-choice questions based on ready-made alternatives, value scale questions, yes / no questions, and open text answers. The first set of 8 questions was concerned with background information, preferences on the use of learning platform and general knowledge about learning analytics. The next 12 questions were structured, mapping the students' experiences on online courses in respect to course design and identifying which aspects were considered important in online learning. Finally, there were some open-ended questions focusing on the student motivation, expectations and experienced barriers to learning. The fields of study of the students who responded to the survey were not defined in advance, but those who studied in blended learning implementations were specifically selected as the respondent groups. Due to the COVID-19 situation, however, the respondents were asked to assess the proportion of online studies in their study program. The share of online studies was estimated at 5% at the lowest and 100% at the highest. There were only minor differences with the three organizations: in Haaga-Helia the average share of online studies was 80,2 %, in Axxell 91,8 % and in Prakticum 87,1 %.

The respondents of Axxell were all studying in the program of early childhood education and all the respondents od Prakticum were students of ICT. In Haaga-Helia, there were more study programs involved although the majority of the respondents studied ICT and digital services or business and entrepreneurship. Nevertheless, the results are not completely comparable, as the students from Haaga-Helia had a variety of courses available taught by different teachers. In vocational basic education programs, student groups usually have a tutor teacher and most of the vocational qualification units are taught by the same teachers.

3 Self-Regulation – The Theoretical Framework of the Survey

The question of self-regulation has been much addressed in educational science. It is widely recognized that self-regulation skills have a fundamental impact on learning [5], and they may be particularly important when studying independently in an online environment. According to a study by Roll and Winne, support for self-regulation is what students actually expect from learning analytics [5]. There's only minor evidence on the use of learning analytics having any effect on learning results [6], and measuring competence development through learning analytics reliably may be difficult. However, learning analytics may be used as a as a tool for supporting metacognitive processes during learning [7], [8].

Self-regulatory processes include for example ability to plan and schedule one's actions, personal goal-setting, use of different learning strategies for different purposes, reflective self-evaluation, identification of personal beliefs supporting self-efficacy and ability to seek help and additional information [9]. Barry Zimmerman stresses that self-regulation is not a measurable skill as such: "it is the self-directive process by which learners transform their mental abilities into academic skills" [9]. Zimmerman distinguishes three phases of self-regulation in a learning process. The preparatory (forethought) phase engages students in setting personal learning goals and planning suitable learning strategies. Students also need to become aware of their self-motivational beliefs such as their interests and orientation on the topic and how competent they feel. The performance phase activates students to observe their learning habits and chosen strategies and change them if needed. Adaptation happens through monitoring of errors and successes. In the performance phase students also use various methods of self-control (such as visualizations). The self-reflection phase pushes students to evaluate and compare their performance and efforts with the expected learning outcomes, standards and results achieved by others. In the final phase, self-regulated learners try to find reasons for succeeding or failing and observe their level of satisfaction [9].

In any learning process, students' self-regulation can be enhanced simply by offering ways to initiate and implement these processes. In an online learning context this would mean for instance providing students opportunities to set their own goals with respect to the expected learning outcomes, suggesting learning paths and schedules for studying, offering tips on alternative learning strategies, offering tests and other means to check one's competence level, and helping students explore their interest and motivation through assignments which are meant for orientation.

In the performance phase students may benefit from well-timed notifications or reminders (to focus their attention), visualizations explaining the study process or the concepts used, and other motivational support. To help student observe their learning habits, it may be useful to plan checkpoints in which students are able to report their feelings, level of commitment and even express their opinion on the workload. Any kind of dashboard collecting numerical data on the students' actions in the learning platform may help them understand and possibly change their behavior. For instance, it may be useful to see how many minutes or hours students have spent reading or writing or going through the course material.

For self-regulation support in the final self-reflective phase, teachers may build in self-assessment practices such as questionnaires or simple self-evaluation questions in connection with assignment submission. There may be sessions for collaborative reflection, peer review practices, feedback given in various ways and oral or written summaries available in the platform.

The link between self-regulation and learning analytics was discussed in a study by Schumacher and Ifenthaler, mapping students' expectations towards learning analytics. Schumacher and Ifenthaler used Zimmerman's cyclical view on self-regulation as the framework and identified some key expectations in each phase. In the forethought phase students hope for planning tools, motivational kicks, to-do lists or comprehensive views on deadlines, clear goals for learning and personalized recommendations. In the performance phase students expect to have continuous update on their performance and

skills development compared to the required competences and learning outcomes. Students also asked for additional material suitable for their skills level, possibilities for social learning and recognition of their learning efforts offline. In the self-reflective phase students look for self-reflective practices and assignments. They also wish for personal feedback given at the right moment [10].

The MOPPA project survey aimed at investigating if any of these recognized expectations are incorporated in the course design and furthermore, if they exist, how does the pedagogical design of online courses with certain functionalities contribute to student self-regulation and motivation?

4 Results

The questions of the MOPPA project survey did not directly map the use or usefulness of certain kinds of platform-based tools such as progress tracking, learning analytics dashboard, or reports for a number of reasons. First, the learning platforms of the participating organizations are different and the learning environment tools used by different teachers in their own courses vary. Secondly, at the time of drafting the questionnaire, it was not fully known if there were any analytical tools available and activated in the three learning platforms. It was also not known how well the students were able to use their organization's learning platform and its functionalities, including the analytics tools that may be available to them.

The questions were drafted in a way that the students did not need to know which functionalities of the learning platform collect data or what kind of student activities can accumulate information about their learning in the system. The starting assumption in compiling the survey was that students may not be familiar with the concept of learning analytics at all. Therefore, in the first part of the questionnaire, respondents were asked to explain the concept of learning analytics. Out of the 93 respondents, 44 (47,3 %) reported that they do not know what learning analytics means or that they heard the concept for the first time. 31 students (33,3 %) tried to explain the concept but failed essentially. Only 18 respondents (19,4 %) were able to describe the concept correctly – and those were students from ICT and digital services in higher education. It has been previously suggested that students do not really understand learning analytics nor the tools used for collecting data [11], and these results point at similar conclusion.

The respondents were also asked if learning analytics had been discussed in their studies. Only 5,8 % of all respondents reported that learning analytics had been addressed. 51,7 % answered that learning analytics had never been discussed, and 42,5 % were not sure if it was ever mentioned.

4.1 Self-Efficacy Levels

In the second question set of the survey, the respondents were first asked to name the course which they based their answers on. Subsequently, it was asked how well the students felt they were able to operate on the chosen course area. The purpose of the

question was to map the level of self-efficacy with respect to the use of learning platforms. The results are described in figure 1.

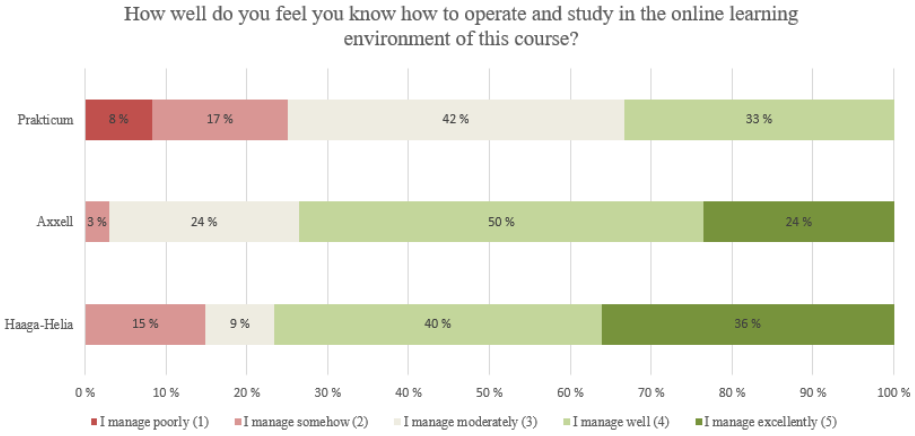

Fig. 1. The respondents' assessment of their self-efficacy level

It is noticeable that none of Prakticum's students thought they managed excellently, and moreover, none of Haaga-Helia's or Axxell's students managed poorly. Furthermore, Axxell's students seem to be the most confident in general, whereas Haaga-Helia students' perceptions are more divided: the majority feels they manage well or even better, but more than 20 % did not feel as competent. The results indicate that some students may have problems with self-regulation, even though it was not directly asked. The lower figures may also refer to other barriers to learning, lack of digital skills or to some problematic issues in the online course design, and therefore respondents were able to briefly explain their answer if they wanted. The answers mostly highlighted the following issues: the structure of the platform was too complicated, the course layout and structure were disorganized and there was too much information or some material was missing, the pedagogical solutions, guidance and communication were confusing, the assignments were difficult, schedules and deadlines were hidden and making personal plans and schedules was hard. The only positive remark referred to the clear weekly plan being used, offering a comprehensive view on how and when to proceed with the course material.

4.2 Pedagogical Solutions Supporting Self-Regulation as Tools in Learning Platforms

Next, the respondents were asked to analyze if they had identified certain pedagogical practices in the online courses which they participated in. The pedagogical practices listed in the question were recognized, as discussed previously, as ways to support self-regulation processes in the forethought phase, performance phase and self-reflection phase. They were also identified as functionalities which may contribute to learning analytics. Therefore, it was interesting to see if students had had any experience on

them in different online learning platforms. The percentages of positive answers are presented in table 1.

Table 1. The amount of positive identification of certain pedagogical practices

Phase	Did the course include the following pedagogical practices (Yes/No)?	Haaga-Helia	Axxell	Prakticum
	A course functionality supporting self-regulation	Yes	Yes	Yes
Forethought	Initial competence assessment (in the beginning of the course)	27,7 %	84,4 %	16,3 %
	Setting personal competence goals	23,4 %	75,8 %	25 %
	Strategies or tools to plan your progression in the course	25,5 %	78,1 %	0 %
	Strategies or tools to schedule your studies in the course	21,7 %	65,6 %	8,3 %
Performance	Study process monitoring (a comprehensive view on all course assignment submissions and grading)	58,7 %	69,7 %	25 %
	Follow-up on your emotions during the course	14,9 %	43,8 %	16,7 %
Self-reflection	Self-assessment on personal skills development during different phases of the learning process	19,1 %	72,7 %	16,7 %
	Self-reflection on your learning	38,3 %	75 %	16,7 %

The first four statements are connected with the forethought phase, the next two with the performance phase and the final two statements with the self-regulation phase. The table shows Axxell's students highly agree on the existence of pedagogical solutions and/or platform tools supporting self-regulation in all the phases. Haaga-Helia's students seem to have experienced measures for self-regulation to some extent in the performance phase. Even Prakticum's students reported proportionally more instances of personal goal setting in the forethought phase, although at large the responses indicate that students in Prakticum are hardly offered any supportive measures for self-regulation.

The experienced differences may be explained with the tools available in the organizations' learning platform. On the other hand, these solutions may be incorporated with very simple tools, if only teachers design these elements to be part of their course. For example, initial competence assessment can be done with simple questionnaire document or with the platform's built-in test or questionnaire tool. Similarly, while study progress monitoring may be organized through a dashboard tool, it can be carried out as a simple spreadsheet or to-do list just as well.

The positive experience rates of Axxell's students may be due to the fact that ItsLearning has a student dashboard (360 reports) for monitoring study progression and the feature is being used in Axxell. ItsLearning also has a built-in learning outcome tool through which students are able to follow which assignments add up to certain learning outcomes and there is also a comprehensive view collecting all the required learning outcomes on a course. A view including all course assignments and grading is available

to students as a separate tab. The teachers have also invested on the overall pedagogical design of their online course. These partly explain why the amount of positive experiences of these elements is significantly higher in Axxell.

In Haaga-Helia, measures supporting self-regulation in the forethought phase seem to be rarely offered. Haaga-Helia's students are Moodle users and on a course level they may monitor their assignment submissions and grades from the gradebook which is visible by default. However, the gradebook view may not be very informative and it may be disorganized; it depends on how well the teachers have adjusted the gradebook settings and if they have turned on the assignment settings correctly. Another tool available to Moodle users is the course progression block, but in Haaga-Helia it is not necessarily activated in all courses. It remains unclear if the positive answers with study process monitoring refer to the gradebook or to the course progression block (which also collects all the assignments and materials to be completed in a course area), or both. However, in the open-ended responses, the progress bar was distinguished by several students as one of the most useful tools of the course. Overall, the survey and the interviews revealed a strong need for progression tracking tools [12].

In Haaga-Helia there seems to be very little opportunities available for following personal skills development on a course level. Moodle does have tools for this: the competence block and the learning outcomes tool. Neither of these is used in Haaga-Helia's Moodle, and therefore the self-assessment is probably carried out as questionnaires or as questions in connection to assignments. Practices for self-reflection are more common, but still the support for self-regulation in the final, self-reflective phase seems to be rather rare.

In Google Classroom there is "View my work" link where students may check their assignment grades and all the graded assignments in a list view. Most likely the positive responses on course progress monitoring are connected with this grading view, since GC does not seem to offer any other methods to follow one's progression or learning outcomes in a course. If this is the case, either the grading view alone is not enough, or students do not know how to use it or alternatively the teachers do not use GC tools for handing out assignments, as the percentage of positive responses of study progress monitoring in Prakticum is so low. Finally, setting personal goals and initial competence assessment in Google Classroom have most likely been done through an assignment created by the teacher, because there is no learning outcome or competence tool available within the platform.

All three platforms have a calendar tool and teachers may set deadlines for assignments. It seems unclear if any tools are offered or suggested for making personal schedules, but at least in Moodle students are able to add their own calendar events into the general platform calendar which collects all deadlines from all of their courses. On a course level, the calendar tool is not available by default and thus usually not visible. In GC, students may also add calendar events and view their own calendar simultaneously with the course schedule. It is possible that the Google calendar is not used in Prakticum, based on the low amount of positive answers. On the basis of table 1 percentages, ItsLearning seems to support personal scheduling, but it was not clear if it was done with a platform tool.

Interestingly enough, none of the platforms seem to highlight gathering data of the students' emotions. This could be done with a simple tool utilizing emoticons, for example. Alternatively, teachers may add questions or assignments where students report their emotional status or describe their feelings in relation to the learning material and assignments. It would be interesting to study how monitoring personal feelings and moods could help students with measures of self-control in the performance phase. In a study by Silvola and colleagues concerning learning analytics and student engagement, students raised a need for tools that would support emotional engagement in learning environments [13]. Monitoring the cumulative data on one's emotions could help students reflect on their performance and competence development, and thus it could potentially help in self-regulation as well.

4.3 Self-Efficacy Levels and Pedagogical Practices Supporting Self-Regulation in Online Learning

To explore the link between the students' perspectives of their own self-efficacy in online courses and their experiences of certain pedagogical practices in the respective courses, the responses were categorized according to their self-efficacy estimates and the alternatives presented in table 1. In table 2, the responses are divided in two columns: the left column represents the share of students who reported being able to operate less than moderately in their online courses. The right column represents the share of students who felt they managed at least moderately. The figures show the percentage of students in these two categories who had identified the listed pedagogical practices in their course.

Table 2. Percentages of yes answers on experienced measures of self-regulation reported by students with lower or higher self-efficacy levels.

	All respondents (n=93)	
Did the course include the following pedagogical practices (Yes/No)	**Self-efficacy under moderate (percentage of positive answers)**	**Self-efficacy moderate or better (percentage of positive answers)**
Initial competence assessment (in the beginning of the course)	45,5	45,1
Setting personal competence goals	18,2	45,1
Strategies or tools to plan your progression in the course	9,0	44,0
Strategies or tools to schedule your studies in the course	9,0	39,0

Study process monitoring (a comprehensive view on all course assignment submissions and grading)	63,4	57,3
Follow-up on your emotions during the course	18,2	25,6
Self-assessment on personal skills development during different phases of the learning process	18,2	51,2
Self-reflection on your learning	18,2	39,0

Typically, students who were confident about their ability to operate on the course more often reported experiencing measures for supporting self-regulation. In particular, offering tools for scheduling one's studies are often identified by those with high level of self-efficacy in all the organizations. Similarly, providing opportunities for self-reflection are more often experienced by students with higher self-efficacy beliefs. Study progress monitoring is a bit more controversial: even though monitoring options are reported to exist, they are more often identified by those students who struggle in their online course. The same phenomenon is visible with initial competence assessments: students with lower self-efficacy levels more often identified having initial competence assessments in their courses. It is perhaps incorrect to claim that study progress monitoring and initial competence assessments reduce students' self-efficacy; rather, it may just as well be the lack of other measures supporting self-regulation that influence the self-efficacy beliefs. Or alternatively, the results also echo the findings of Park & Jo in 2015, reporting that students are unable to correctly interpret and utilize the data dashboards in learning environments [14]. Another possible interpretation is that learning analytics dashboards are in some ways demotivating for students with lower achievement level [15]. Nevertheless, having study progress monitoring available may lead to a situation where students are continuously informed about their failures to deliver the scheduled tasks. This combined with the reported problems of the courses (incoherent structure, lack of guidance and communication, and unclear scheduling) creates confusion and dissatisfaction, which may also result in lower levels of self-efficacy and motivation.

4.4 Monitoring Learning with Dashboards

Study progress monitoring in online learning platforms is surely more than just checking final grades; it is about keeping track of all the course material, observing what is completed and what more there is to do. Monitoring one's behavior and keeping track of the different acts of learning is what matters for self-regulation in the performance phase. Therefore, the survey respondents were asked if a dashboard view available in the learning environment would help them in their studies.

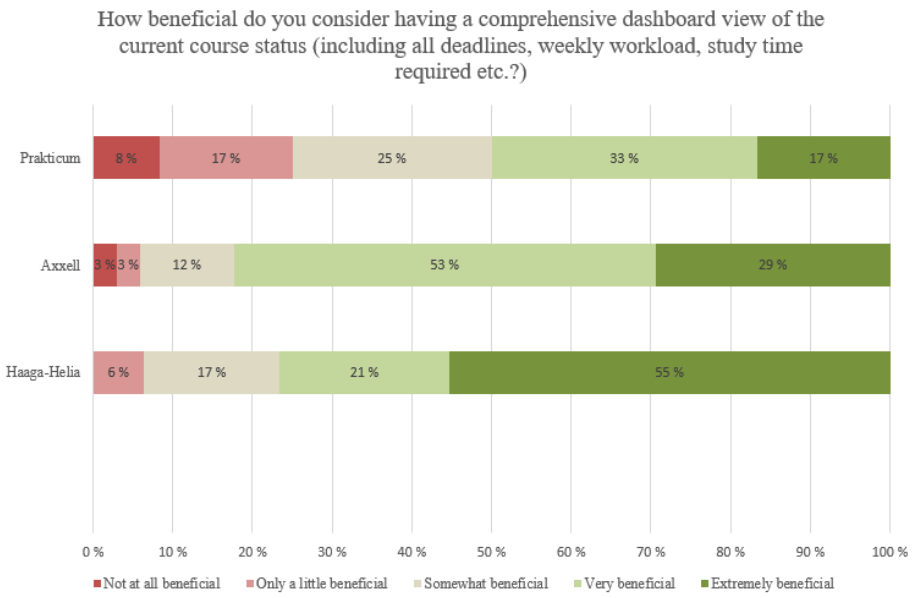

Fig. 2. Estimated usefulness of a monitoring dashboard

Axxell students' appreciated dashboard views the most in general, although Haaga-Helia peaked with the most extreme opinion. The differences in the percentages between very beneficial and extremely beneficial may be explained with the already available 360 reports view in ItsLearning. The site-level dashboard view in Haaga-Helia Moodle is quite limited: it only shows the overall percentage of completion of the courses which utilize completion tracking. On a course level, no dashboard view is available. This may explain why Haaga-Helia's students feel a dashboard view would benefit them, whereas in Axxell the need has already been satisfied. In Prakticum the need for a dashboard view was slightly lower; but nevertheless, in all the organizations the need for a comprehensive dashboard in the learning platform clearly emerged.

Respondents were also asked if the get any visual information on their actions within the learning platform (Figure 3). The responses from Prakticum indicate that Google Classroom offers a bit less graphics than the other platforms. The opinions of Haaga-Helia Moodle users are divided, but on the whole, there are some visualizations evidently available. Most of Axxell's students reported having information in visual form to some extent or quite a lot. As pointed in table 1, ItsLearning users reported higher positive answers (69,7%) with the availability of study progress monitoring than Moodle users (58,7%). Moreover, as most ItsLearning users feel that there is quite a lot visual information available, it is fair to say that ItsLearning seems to display the data in a more graphic way as compared to Moodle or GC. Interestingly enough, in the follow-up question nearly all Axxell's respondents (96 %) reported that the amount of visualizations was enough for them, whereas with Haaga-Helia's students the number was only 60 %, and about 38 % responded that there weren't enough visualizations

available. In Prakticum, the percentage of students satisfied with the amount of visualizations was 82 % and only 18 % wished for more graphs.

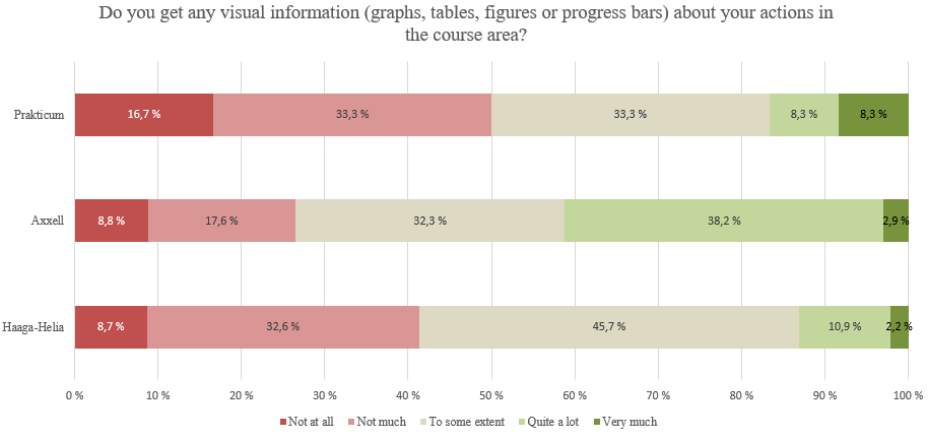

Fig. 3. Estimated amount of visualizations in the learning platforms

Why is it that Moodle users crave for more visualizations even though they are at least to some extent available? It may well be that nearly all those who responded having only a few or no visualizations (41,3% of the Haaga-Helia respondents) belong to the 38 % who hoped for more graphs. One explanation for this could be that the visual tool selection is differentiated in Haaga-Helia Moodle courses as it depends on whether the teacher activates the visual progression block or not. The use of available blocks and activities is not regulated nor forced through administration, leaving teachers with the responsibility to apply the tools in their courses. It is also interesting to note that while Prakticum's Google Classroom seems to offer less visualizations than the other learning platforms, the students were quite happy with the situation.

4.5 Peer Comparison and Self-Regulation

The respondents were asked if they would benefit from having information on how they succeed and progress on the course compared to their fellow students. The respondents' opinions are summarized in figure 4.

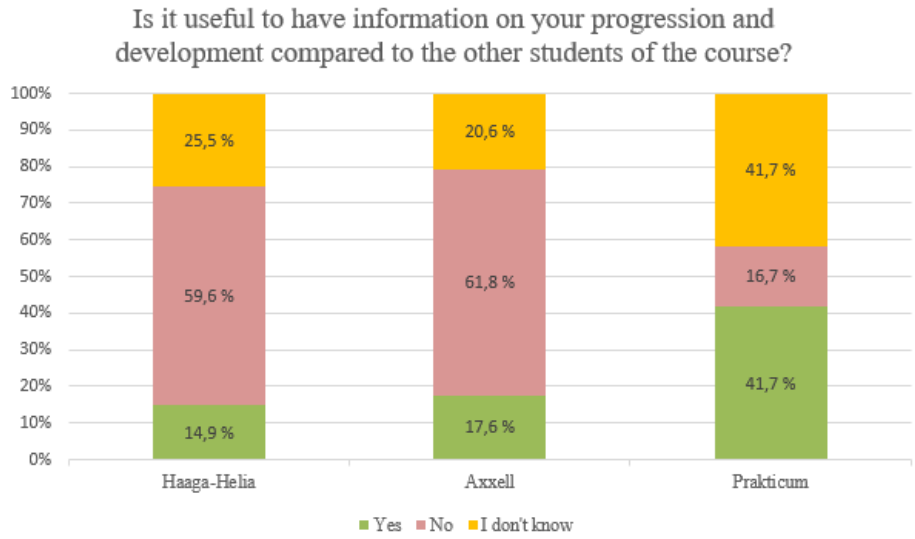

Fig. 4. Students' opinions on the usefulness of peer comparison

Most of the students in Axxell and Haaga-Helia did not consider peer comparisons useful while students in Prakticum were more positive towards it. The difference may be explained by the respondents' age. The survey participants in Prakticum were all young, between 18 and 20 years of age, while in Axxell the age range was from 19 to 61 and in Haaga-Helia from 21 to 56. Zimmerman has pointed out that novices are more likely to value peer comparisons than experts. Novices pay less attention to the forethought phase in their self-regulation process, and therefore "they fail to set specific goals or to self-monitor systematically, and as a result, they tend to rely on comparisons with performance on others to judge their learning effectiveness" [9]. Others suggests that the desire for peer comparisons is not a question of age but rather it depends on the level of motivation or goal-setting skills, and that peer comparisons could help students to self-regulate when the motivation or the ability to set personal goals is low [8]. Interestingly enough, one of the respondents who was interviewed mentioned how peer comparisons could potentially reduce motivation by increasing the students' sense of inferiority and by adding extra pressure to succeed on the same level as others, thus also affecting self-regulation negatively [12]. Auvinen and colleagues tested predictive visualizations based on comparative peer data, and their results suggest that such comparative visualizations only help students to self-regulate if they already have some level of interest to do so and who also perform on a higher level [16].

The median age of the respondents in Haaga-Helia (34) and Axxell (38) suggest that in these two organizations, students are more experienced and do not have the need to compare their skills or progression with other students. This view was strengthened by the open-ended answers in which many students commented how their prior work experience defined their learning path, progression and study efforts a lot and therefore peer comparisons were in a way useless. Also Zimmerman argues that for experts, self-

evaluation against their own learning objectives is more important, as it affects their learning efforts and produces a higher level of self-efficacy [9].

Nevertheless, there is an interesting link between the preferences on peer comparisons and the factors which are considered important in online learning. The respondents were offered various statements on the positive aspects of online learning, and they were asked to choose the three most important ones for them personally. The chosen preferences were quite similar except for the first choice, as presented in table 4.

Table 4. The positive aspects of online learning perceived as important by the respondents

	Haaga-Helia	Axxell	Prakticum
I can study together with my peers	4 %	0 %	92 %
I can do assignments at my own pace whenever I want	85 %	89 %	75 %
I can progress according to my own skills level	23 %	32 %	8 %
I get more guidance than in classroom	4 %	4 %	0 %
I get feedback on the assignments from the teacher	21 %	11 %	17 %
I get feedback on the assignment from other students	2 %	0 %	8 %
I can go through the course material as many times as I like	40 %	61 %	33 %
I can access and store the study material in one place	36 %	43 %	17 %
I can download the material from the platform to be able to access them offline	19 %	0 %	8 %
I can check the study schedule in the platform	23 %	11 %	8 %
Submitting assignments is easy	34 %	50 %	33 %
I can access all the important services and links to other systems and applications in the platform	4 %	0 %	0 %
Something else	2 %	0 %	0 %

The top choice in each organization is marked with green, the second popular choice is marked in blue and the third place is indicated in yellow. It is interesting to see that studying with peers was clearly the most important aspect of online learning in Prakticum, where students also appreciated having peer comparisons. In Axxell and Haaga-Helia, studying with peers had little or no significance. Being able to study at one's

own pace is highly rated in all organizations, and finally, the ease of accessing material and submitting assignments in online learning is somewhat important to all respondents.

The results may suggest that peer interaction may play a role in self-regulation of younger students. The importance of peer collaboration may also be due to the pedagogical design of the course: if the study process is designed to include lots of group work, peer collaboration evidently becomes important also in online studying.

5 Conclusion

The comparative analysis of the responses indicates that in Axxell, students have the strongest self-efficacy beliefs concerning their ability to study in their learning platform. They also had the most experiences on certain pedagogical practices which are proven to support self-regulation. The students in Prakticum had the lowest self-efficacy when it comes to studying in the online platform; in addition, they reported having the least experience on the pedagogical practices supporting self-regulation. In Haaga-Helia, the self-efficacy levels were moderate even though the incidences of pedagogical practices supporting self-regulation were quite uncommon in the learning platform. On the basis of the survey it is impossible to define whether the differences are due to the learning platforms being used. Some explanations were suggested based on habitual observations made of the tools available in Moodle, ItsLearning and Google Classroom. Ultimately, the differences may depend either on the tools available on the learning platform or pedagogical choices made by the teachers. It is highly likely that both aspects are reflected in the prevalence of certain measures supporting self-reflection.

On the basis of the survey responses, some issues may be highlighted with respect to learning analytics. Student dashboards collecting and presenting learning data are much appreciated and quite useful for self-regulation in the performance phase. Peer comparisons in the form of comparative progression or competency reports and ranking lists may be useful and engaging for younger students, but generally adult students did not have a need for comparative analytics in dashboards. However, the influence of comparative peer visualizations on student motivation and self-regulation remains unclear, and the ambiguity in previous research findings call for more studies on the topic.

It is worth asking if the information provided by descriptive learning analytics dashboards truly help students to self-regulate their learning. In her research, Hooli noted that students had mixed experiences on visualizations: they weren't considered useful for planning studies and the information was not meaningful [17]. This survey suggests that student consider learning analytics dashboards beneficial, but it remains unclear if monitoring learning through dashboards is enough to support or improve self-regulation. To ensure full support for self-regulation, learning analytics dashboards should collect data on activities during all the phases of self-regulation [17],[10] and therefore attention should also be paid to the pedagogical design of online courses. As the results show that students do not understand learning analytics properly, they should be familiarized with the use of learning analytics tools. In particular, students should be

provided with workshops where they can learn concrete ways in which they can follow their own study data and make plans based on it.

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