Delayed Start of Lessons; a Pilot Research Study

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Abstract.

Within the scope of a Special Interest Group (SIG) initiative by the Professional Development Unit (PDU) at Middle East Technical University-Northern Cyprus Campus, School of Foreign Languages (METU-NCC, SFL), a group decided to focus on the issue of sleep and its effect on academic success and drop-out rates among students. The group felt the root cause of the problem should be investigated, and then, it could come up with ways to help students avoid failure and reduce the risk of dropping out. Scientific study has shown that young adults experience a change in their body clock due to the natural process of human development. (Crowley et al., 2007) In addition to the natural shift in sleeping patterns of young adults, there is a sleep Delayed Sleep Phase Disorder (DSPD) in which the body clock remains permanently delayed (Gradisar & Crowley, 2013). It is estimated that about 1% of adults suffer from this serious condition, which can require medical and psychological intervention to reverse. Some studies have shown that DSPD has a higher rate among young adults, with some researchers claiming the rate can be between 10-15% (Gradisar & Crowley, 2013). In our context, that means two or three students in each class could be suffering sleep deprivation which impairs their chances of performing academically. Possible solutions were presented to the SFL Academic Board, and, delayed start of lessons with one group was piloted with seemingly positive results presented in this paper. The findings provide a basis for further investigation into the connection between sleep and academic success.

Keywords: DSPD, sleep, academic, circadian, university

1. Introduction

Some instructors at the METU SFL were curious to learn how best to initiate and implement innovation at the institution, especially with regard to ideas to limit the high dropout rate. Several instructors decided to take an eDx MOOC course on Launching Innovation in Schools (Launching Innovation in Schools.(n.d.).Retrieved from https://www.edx.org/course/launching-innovation-in-schools.) in the hope that this would provide a framework to enable staff to effect innovation at METU-NCC, SFL English Preparatory Program (EPP). The course suggested

finding a common cause among instructors to focus efforts to find innovative solutions relevant to the institutional context, and follow the guidelines given in the course to

systematically move towards the launch of an innovation. At the same time, the SFL Professional Development Unit was spearheading a year-long project to support instructors in forming Special Interest Groups. The Launching Innovation SIG was formed, and the common issue that was identified by the group related to the high dropout rate was the problem of sleepy students. The official approach in dealing with students sleeping in class is to warn them and if the situation continues mark them absent, but the group felt that this was not addressing the root cause of the problem and, as a result, it could potentially put more students at risk of dropping out. Generally, the students who fall asleep in class are less successful, and are therefore at a higher risk of dropping out.

In brief, the group found that scientific study has clearly shown that young adults experience a change in their body clock due to the natural process of human development (Schmidt, et al., 2007). The difference starts gradually at onset of adolescence, and peaks at about a delay in the body clock of two hours at age 18. This delay gradually decreases until the body clock at about the age of 22 is the same as adults. Of course, this shift varies according to person, but it is a general pattern observed in human development. Aspects of modern society, the traditional scheduling of classes based on adult working hours, and the negative influence of digital technology on sleeping patterns, have conspired to exacerbate the natural shift to later sleep and wake up times in young adults, resulting in higher risks of sleep deprivation which leads to impaired cognitive ability, depression and other side effects that manifest themselves in poor academic performance (Urner et al., 2009)

In addition to the natural shift in sleeping patterns of young adults, there is a sleep disorder in adults called DSPD (delayed sleep phase disorder) in which the body clock remains permanently delayed, generally with sleep only beginning around 3 a.m.. It is estimated that about 1% of adults suffer from this serious condition, which can require medical and psychological intervention to reverse. However, studies have shown that DSPD has a higher rate among young adults, with some researchers claiming the rate can be between 10-15%. In our context, that means two or three students in each class could be suffering serious sleep deprivation which not only impairs their chances of performing academically but, if left untreated, it could become a chronic disorder.

The group presented its ideas for innovation solutions to the SFL Academic Board and put forward three main innovations to limit the effects of sleep deprivation, and consequently lower the dropout rate:

- Delay the start of classes
- Provide sleep, nutrition and exercise awareness training
- Promote awareness of the benefits of mindfulness practice

The Academic Board agreed to one of the options put forward by the Launching Innovation SIG to pilot the delayed start of lessons with one EPS level in the fall semester of 2017. The only group that was deemed to be suitable for a single semester pilot was the ETP (English Towards Proficiency). The ETP group meets four hours a day, but the students in this group are not typical of the first year student profile, as they are students who got between 50% and 59% on the proficiency test at the end of the first year and are taking a special course in their second year at METU-NCC, SFL to prepare for the proficiency test. While it would be impossible to compare the effect of a delayed start on performance or any other criteria with ETP groups from previous years, it was decided that it would be possible

to compare the 2016 and 2017 cohorts in terms of absenteeism alone. This was not an ideal group to pilot the later start since the student profile is very different to the majority of incoming students in other levels, but the SIG hoped that it would provide insights about a later start to lessons that could inform consideration for the following academic years.

2. Method

The Launching Innovation SIG introduced ETP students to the pilot project and the rationale for delaying the start of lessons. Due to workload and time constraints, the SIG members were not able to address the second two aims of providing sleep hygiene awareness and mindfulness practice. However, the Guidance and Psychological Counselling unit organized a seminar by a visiting psychologist on sleep in January, 2018, which was open to all METU students in Turkish, in which the importance of sleep hygiene was presented.

The attendance records from ETP 2016 were collected and the number of absent students in each of the ETP groups were counted for each of the four lessons every day for the entire first span. The same data from the ETP 2017 cohorts were also collected.

In addition, the SIG surveyed students at the end of span 1 (spans are 5-6 weeks of learning between midterms) to get their feedback, and once again at the end of the semester. The SIG also canvassed the instructors for their feedback and impressions of the effect of delaying the start of lessons.

3. Findings

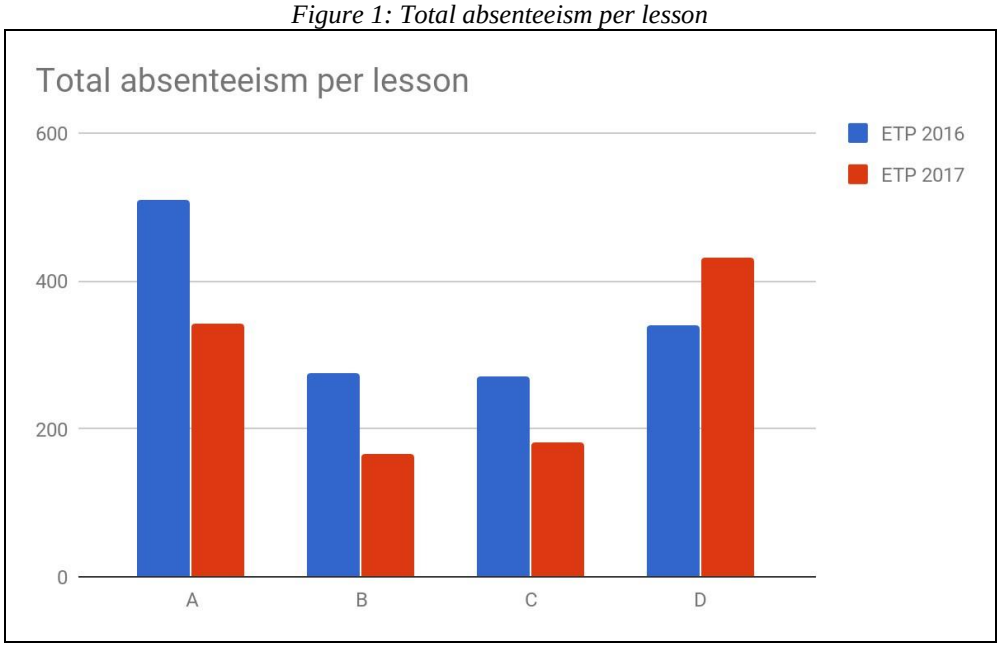
3.1 Truancy Profile Summary - ETP weeks 1-6, from 2016 and 2017

Table 1: Truancy Profile Summary - ETP weeks 1-6, from 2016 and 2017

	Total lessons taught	**Total students taught**	**Total student lesson hours**	**Total hours absent**	**Truancy %**	**Average truancy per student**
ETP 2016	420	98	41,160	1,394	0.0339	14.22
ETP 2017	392	87	34,104	1,123	0.0329	12.91

3.2 Truancy profile by class hour

Figure 1: Total absenteeism per lesson

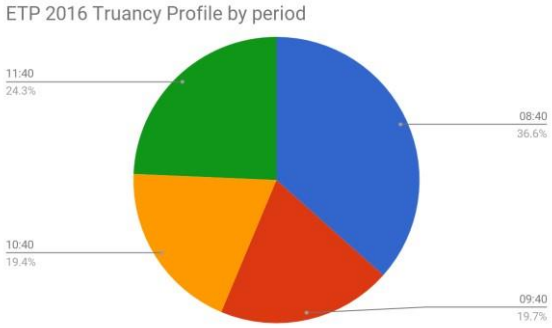


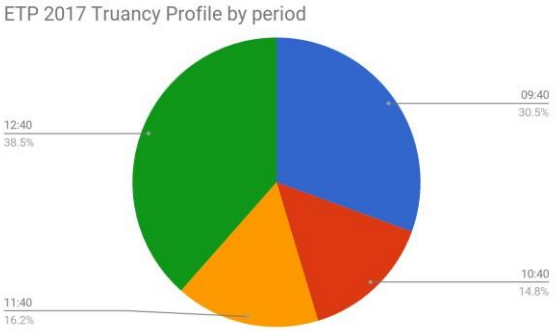
The bar chart above shows the actual number of truant students in the four lesson times in ETP 2016 [A(08:40-08:30); B(09:40-10:30); C(10:40-11:30); D(11:40-12:30] compared to the four lesson times ETP 2017, when the start of lessons was delayed by one hour. The overall picture that emerges is that the absenteeism profile for the ETP 2016 cohort showed a greater number of students missed the first lesson than any of the other lessons. In contrast, in the ETP 2017 cohort with the delayed start of lessons, we find that the greatest number of students missed the last lesson.

3.3 Truancy profile lesson hour comparison

Figure 2: Truancy profile lesson hour comparison

ETP 2016 ETP 2017





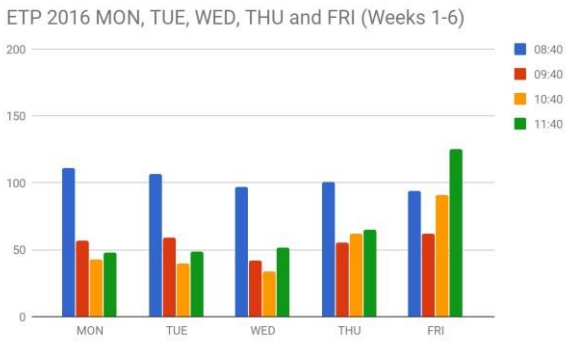
The pie charts give us a clearer picture of the relative differences as a percentage of the absenteeism by class hour. As the overall truancy profile indicates, absenteeism per student decreased overall in 2017 by 1 hour. The pie charts above show that students were less likely to be absent in the first three class hours in 2017 than 2016. However, more absenteeism occurred in the fourth hour in 2017 than 2016.

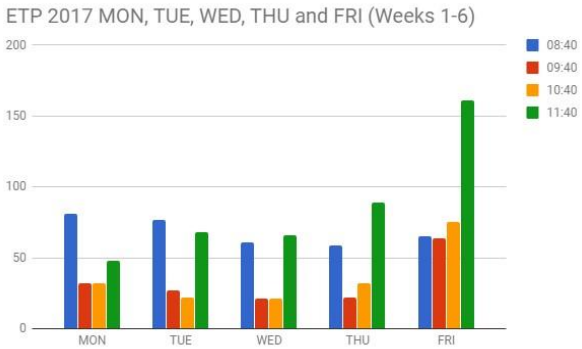
In summary, overall absenteeism was slightly down in 2017 (measured in hours per student), but there was a shift in fewer absent students in the first three hours, and more in the last hour when compared to the truancy profile of 2016.

3.4 Truancy profile by day of week

Figure 3: Truancy profile by day of week

ETP 2016 ETP 2017



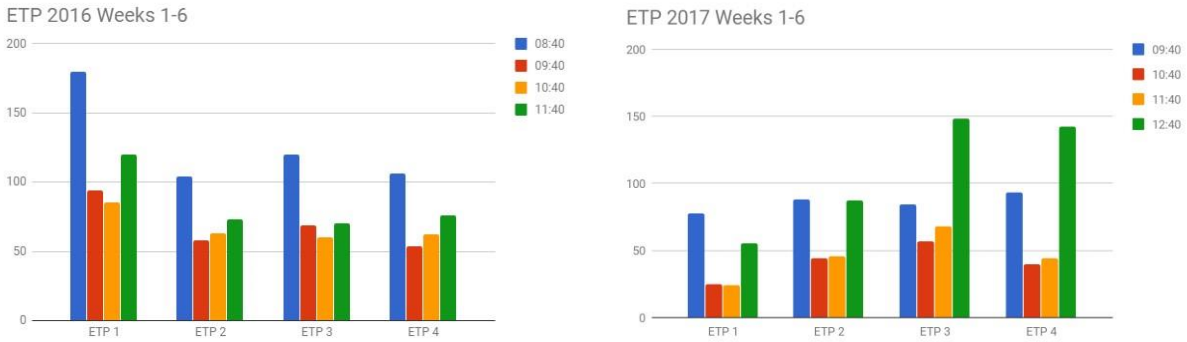


These bar charts reveal the trend in the shift in absenteeism from the first lesson to the last lesson according to day of the week. In 2016, the only day of the week in which the last lesson had more absenteeism that the first was Friday, but in 2017 the absenteeism in the last lesson was the highest on Wednesdays, Thursdays and Fridays.

3.5 Truancy profile class comparison

Figure 4: Truancy profile class comparison

ETP 2016 ETP 2017

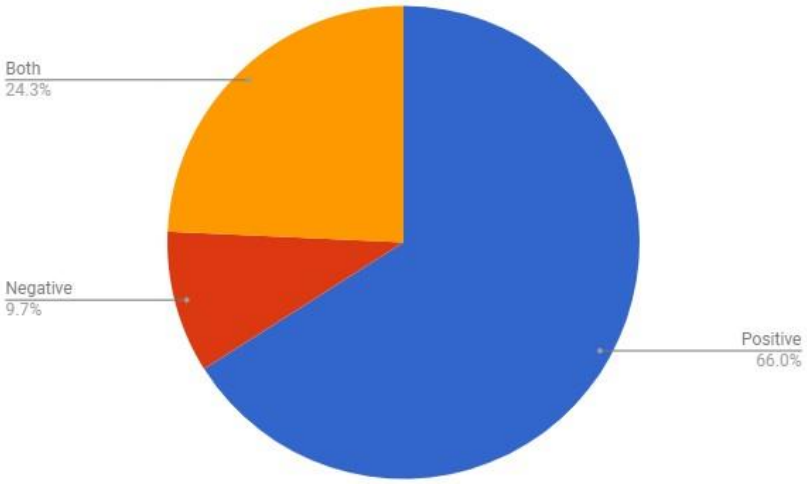


While the overall trends are clear when we combine the data from each class, it is worth noting that there is considerable variance between classes in terms of when students were absent. It would seem that there are class dynamics at work as well. Also, the distribution of students potentially suffering from DSPD may not be equal across all classes. In 2016 one class stands out in having a much higher absenteeism rate than the other three. In 2017, one class stands out as having a much smaller absenteeism rate than the other three, with two of those showing a spike in the rate of absenteeism in the last hour of the day.

3.6 Student Attitude

Overall, the students were positive about a delayed start. About 10% expressed negative views regarding a delayed start of lesson. Over two-thirds of the students were positive about the delayed start of lessons. About one-quarter had mixed opinions, expressing a balance of both positive and negative comments.

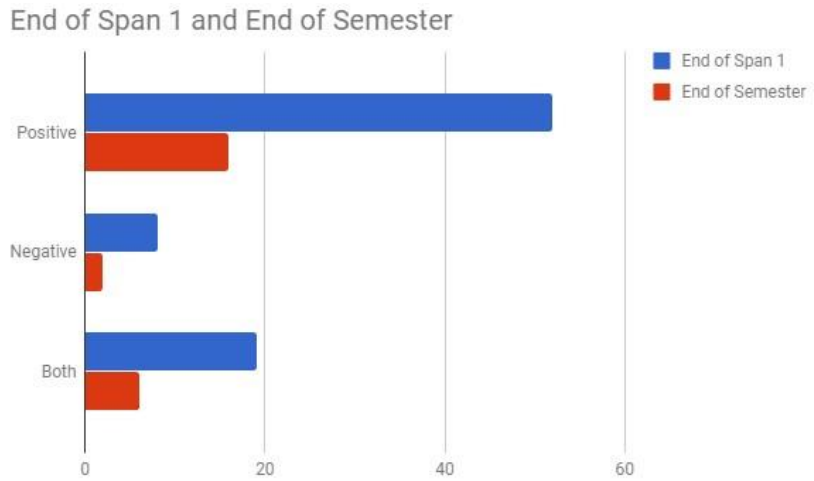
Figure 5: Student Attitude



We surveyed the students at the end of the first span and at the end of the semester. There is a perfect correlation between the nature of the responses at the end of Span 1 and

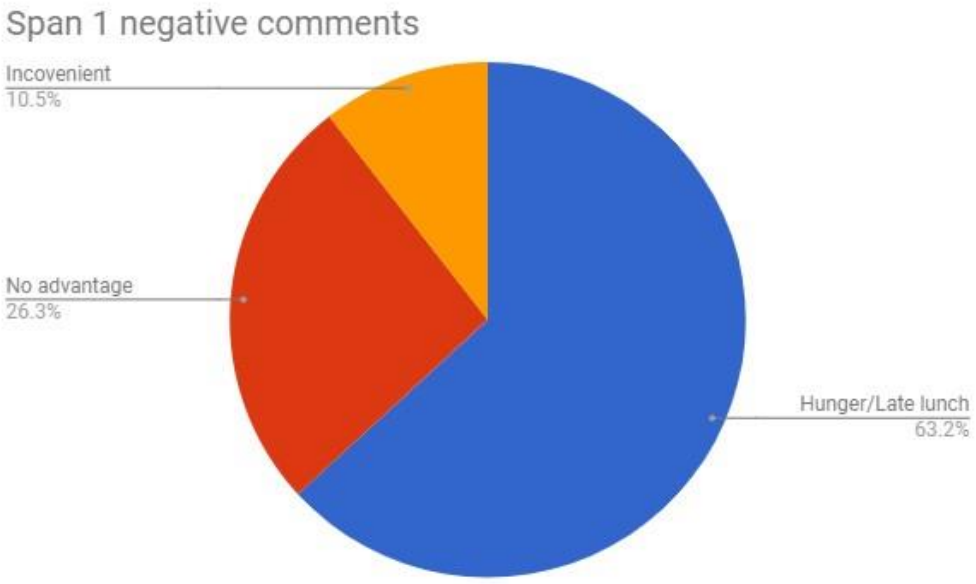
at the end of the semester, indicating that there was no overall change in the students' attitudes toward a delayed start from the first span to the end of the semester.

Figure 5: End of Span 1 - Comments



The majority of negative comments at the end of span 1 were related to a late lunch and hunger.

Figure 6: End of Span 1 - Negative Comments

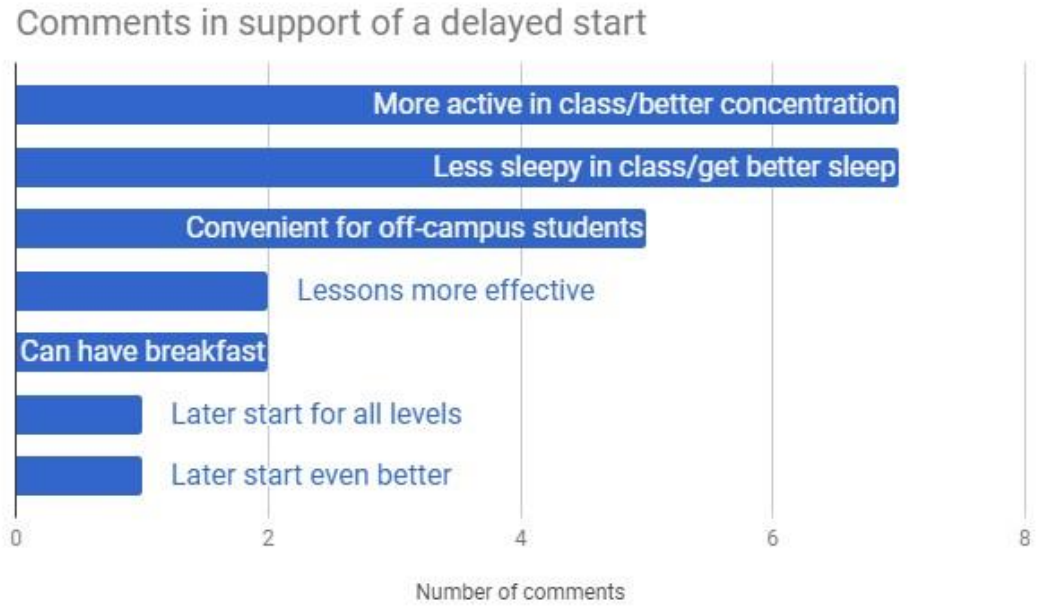


Although there were fewer total comments at the end of the semester, the same pattern was evident.

Figure 7: Comments against a delayed start

We didn't analyze the positive comments at the end of span 1, but at the end of the semester, the positive comments focused more on improved learning and better concentration.

Figure 7: Comments for a delayed start



3.7 Instructor perceptions

We also canvassed the instructors to reflect on the delayed start on student behaviour. We received feedback from three of the four instructors.

Of the three instructors who answered the questions, one has only negative perceptions. This instructor stated that: "Students will always use the extra time to stay awake (at night) and not

sleep." The instructor also mentioned that this kind of an innovation can only be successful provided the whole education sector shifts the starting time to 9.30.

Another instructor had both negative and positive perceptions.

Negative points:

- *"Lessons finish later than usual and I'm not used to this."*
- *"Students feel exhausted until the class is over."*
- *"Students feel hungry; in fact they are starving."*
- *"It's extremely difficult to get students to focus after 12 o'clock."* Positive points:
- *"I don't have to rush from home to work in the morning."*
- *"I can have breakfast at home."*
- *"Few students have breakfast during the first hour."*
- *"Few students look sleepy/tired in the morning."*

The last instructor who filled in the form has mainly positive ideas except for one negative, that being "more absent students in the last hour." This instructor's positive comments are as follows:

- *"There were fewer absent students in the first hours."*
- *"As a teacher, I had more time for some more class preparation."* *"Most of the students were more focused and motivated."*

Additionally, two of the instructors provided these other comments:

- *"A great majority of the students in the ETP group succeeded at the end of the term. However, I am not sure whether this is the effect of the 9.30 lessons or some other factors."*
- *"I think this could work provided that students are instructed/guided towards developing healthy eating habits."*

4. Discussion

As mentioned earlier, the drawback of looking only at absenteeism means that we don't consider other factors. For example, the data has been collected per class, so we don't see if there are any individual patterns in terms of absenteeism. The absenteeism in one class might be mostly from chronic absenteeism in three or four students, while in another class the pattern of absenteeism may be spread out among all students. In the former case, the class may contain a number of students who might be suffering from DSPD and should be identified as they are most likely in need of intervention to minimize the negative effects of

this disorder. In the latter case, it might be more of an issue of developing effective timemanagement skills (Macanet al., 1990).

Another factor is the quality of the learning experience. As mentioned in the summary of truancy, absenteeism hours per student is slightly less in 2017, but what we don't know is whether the 'quality' of student participation in the first two hours is of a higher or more productive level than in 2016. The 'quality' of learning experience could be measured with some tests of attention span, reflexes and cognitive ability at different times in the morning. This might give insights into the optimum times for learning. In other studies, in the UK, Canada and the US, of the effect of delayed start on academic performance, the general trend from the findings is for an improvement in success rates despite some controversy due to lack of data collection and the intermingled nature of the issue with state, political, social and business issues. The Ministry of Education in the UK also stated that the decision for a later start of lessons depends on the school. (Wahlstrom et al., 2014, Storey, 2019,). Although a great majority of the ETP students in 2017 succeeded at the end of the term, considering the overall success rate on its own cannot be linked to the delayed start, as there are many other factors that were not considered in the pilot project.

Another issue of concern is the shift in the truancy profile, with a higher percentage of students being absent in the final hour. In 2016, based solely on absenteeism, one could presume that the first hour is less productive, and the last three hours are more productive. In 2017, it looks like the first three hours are productive, and the last hour is less productive. Again, because ETP has only four lessons, it is difficult to generalize to other levels, such as Lower-Intermediate which has five lessons a day, or the Beginner level which has six lessons a day. The higher absentee rate in the final hour may be related to the main negative comment about the delayed start, which was related to hunger and missing out on the main food service in the canteens. The Lower Intermediate level also has its final hour during the normal lunch time, so perhaps an analysis of the truancy profile in that group would shed light on whether a common lunch hour among all levels is seen as desirable among students.

As noted previously, there was considerable variance between the truancy profiles of the four ETP classes, but we did not collect data to determine what might have influenced such dramatic differences between classes. When considering the insights of the instructors, it is likely that the instructors' perceptions would have been influenced by the profile of the class they were teaching. Likewise, an instructor's previous experience in teaching ETP may also affect their perceptions of the change. However, for the purposes of the pilot project, we could only gather the general perceptions of the instructors. The feedback from the instructors mirrored the wide range of opinions expressed by the students, from totally negative to ambivalent to overwhelmingly positive. Like the majority of negative comments from students, a major issue appears to be related to students feeling hungry in the last lesson and missing out on the common lunch hour.

5. Conclusion

Overall, students were positive about the delayed start, so it seems worth further study and consideration to see if it is possible to apply this to all EPP courses. The drop in absenteeism was small, but consistent with the general trend of lower truancy which has been

reported in other studies. Likewise, the overall success rate of the ETP students was slightly better than previous years, and although the delayed start cannot be the only contributing factor, the improved success rate is also in keeping with the findings of other studies.

Negative comments related mainly to the onset of hunger towards the end of the lessons, and the fact that the last lesson extended into the common lunch hour. It is clear that there is a much higher rate of absenteeism in the final hour in 2017 than 2016, so it is likely that the hunger factor contributed to this. Any delay to the start of lessons would need to consider ways to address this issue.

The analysis of student comments after the first span and at the end of the semester indicate that there was no change of opinion about the potential benefits of proper sleeping habits. This was most probably due to the fact that the students were not provided with sufficient sleep, nutrition and exercise awareness training, nor were they made aware of the benefits of mindfulness practice. Regardless of whether a delayed start of lessons is implemented or not, students should be made aware of proper sleep hygiene and trained in techniques to ensure the best possible sleep and nutrition.

The comments of both students and instructors show that for some an early start was advantageous. At the other end of the spectrum are the students who appear to have chronic sleeplessness, possibly suffering from delayed sleep phase disorder, for whom an even later start would be a vital part of the strategy to help them overcome the disorder. While a delayed start may be an inconvenience to a few students who are early risers, they can still function perfectly well. However, if the needs of the group of students who may be suffering from DSPD are not met, then these students may suffer serious consequences which may lead to a much higher risk of dropping out. Considering that these students could account for 10% to 15% of the entire student body, and perhaps 25% to 30% of the dropout rate, a delayed start of lessons could have a significant impact on this group of students, as well as the majority of the others who are experiences the normal shift in sleeping patterns of young adults.

Acknowledgment

This paper is an output of a pilot research within the scope of a Special Interest Group (SIG) project initiated by the Professional Development Unit (PDU) at Middle East Technical University-Northern Cyprus Campus, School of Foreign Languages (METU-NCC, SFL) during the 2017-2018 academic year. METU-NCC is located in Kalkanlı, Güzelyurt T.R.N.C. on the island of Cyprus.

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