

Experts and Students Demand Andragogical Insights in Learning Beyond Pedagogical

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Abstract

Past research showed that experts with more specialized knowledge tend to criticize educational implementations and curriculum content sharply. Whether the intensity of these criticisms originates from domain specific knowledge or expertise is unknown, as experts are highly independent, internally motivated, and self-directed learners. This study hypothesizes that when adults with specialized knowledge comment on educational implementations, they may project their own intellectual competences onto their judgments, in a phenomenon called as intellectual mirroring. The purpose of the study is to investigate to what extent intellectual mirroring has been hampered by an over-reliance on pedagogical or andragogical insights. The study employed the qualitative research approach, in which the qualitative data were obtained from a series of focus group discussions and individual interviews with primary and secondary school students ($N_{\text{focusgroup}}=8$) and teachers ($N_{\text{interview}}=5$), who live in the UK. The content analyses identified 14 sub-themes under 6 global themes for students; and 10 sub-themes under 4 categories for teachers. The results showed that the nature and intensity of elder students' criticisms were highly similar to those of experts' previously found. Older than 14-year-old students claimed more independence in their learning journey and showed high motivation for specific topics, which can be interpreted by andragogical insights. However, teachers questioned students' competences for self-directed learning, and emphasized curriculum based requirements, which is driven by pedagogical insights. As opposed to the teachers, from the students' point of view, intellectual mirroring is not the consequence of domain specific knowledge or expertise.

Keywords: pedagogy, andragogy, students, teachers, development

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Introduction

The term pedagogy is made up of the ancient Greek *paidos* (child) and *agogos* (leader), stands as an umbrella term for the theories and methods of teaching. Andragogical theory, on the other hand, combines *andr* (man) and *agogos* (leading), and refers to principles of adult education; stands historically as a much more recent concept and is defined as pedagogy distant. While both accounts reflect the unique characteristics of the two lines of theory, from what age people can benefit from andragogical insights in their education is unclear. Taking into account developmental perspectives, the present study aims to explore whether indeed children demand andragogical insights in their learning; how their perspectives on their needs evolve with age, and furthermore, whether other experts like teachers would agree with this tendency.

The junction between pedagogy and andragogy

The concept of andragogy, expounded independently, primarily reconceptualized by Knowles in the 1980's. He (1980, 1984) introduced the concept of andragogy as the science and art of adult learning and distinguished between instruction-centered pedagogy and learner-centered andragogy. The latter theorized and qualified the mature forms of learning as:

- Independent self-conceptual thinking
- One's ability to direct his/her own learning,
- Accumulating a reservoir of experience that supports learning,
- Changes in social roles: less obedience towards teacher-centered approaches,
- Problem/interest focused learning,
- Confidence in accessing knowledge,
- Internal motivation for learning.

While andragogy profiles adult learners based on these assumptions, it is also highlighted that as people mature, they become more self-directed in their learning, show more interest in why a particular topic is important to learn, or whether indeed certain information is relevant to the actual problem they intend to solve. Stemming from either personal interest, desires, or needs, mature learners seem to be naturally motivated towards the knowledge they seek. This may be the effect of previous life experience in combining conceptual and procedural knowledge, providing them with advantages when they enter educational activities.

Both pedagogical and andragogical theory concede that children hold a conditioned subject-centered orientation in their learning, whereas adults hold a problem-centered orientation, where quantitative and qualitative characteristics of motivators differ. In children, the characteristics of motivators are largely external, so children are more likely to look to role-models and revolve their learning around them. In adults, motivators are likely to be internal, revolving around essential needs, and learning is more relevant to social roles (Knowles, 1980; Tennant, 2006). In Piagetian (1952; Piaget & Inhelder, 1969) tradition this differentiation is pinpointed by the gap between perceiving and knowing, highlighting that children typically strengthen their perceptual competences by gaining knowledge through the invariant sequence of stages. For adults, it is more focussed on conceptualization and responsibility of knowledge, guiding, and autonomous strategies (Mascolo, 2009, Sandlin, 2005).

Mezirow (1983) creates a charter for andragogy to rank the degree of decrease in learners' dependency on educators and formal institutions. He defines andragogy as an organized and sustained effort to support the capability of self-directed learning. The charter takes the concept of self-directedness as the mean of adult learning and highlights its 12 essential elements, ranging from a progressive decrease in learner's dependency on the educator towards an increasing responsibility for defining one's own learning objectives and planning. Apparently, self-directed learning corresponds to a cluster of terms, such as independent, autonomous learning, critical thinking, the ability to self-initiate and define purpose, planning, time management, and progress evaluation. Not only does the degree of dependency on teacher-led learning decrease, it can be seen that learning can take place in many situations independent of educational institutions, including at work, at home, or through leisure activities (see also Caffarella, 1993; and Tennant, 2005).

Mezirow's (1983) ontological account also provides an explanation for what facilitates this process. He proposes the development of metacognitive abilities as the legitimization for advanced reasoning. The model possesses three main layers containing various competences. In the center, the notion of reflectivity is placed to refer to the awareness of habits of seeing, thinking and acting. This layer is surrounded by conscious competences. The third layer is named as critical consciousness, which refers to becoming aware of our awareness in a critical manner. It is defined with the help of Maudsley's (1979) adapted term, namely *meta-learning*, which is defined by the processes through which learners improve their awareness in controlling the habits of seeing, thinking, and acting; a common element of perspective transformation involves not only becoming critically aware of these habits, but also of the cultural assumptions governing rules, roles and social schemas. Critical reflectivity plays a crucial and unique role in adult learning. Although an immature form of critical reflectivity is found in children, it seems to be an organized effort in facilitating perspective transformations across a lifespan.

The present study

Despite the appeal of the theoretical differences between child and adult learning, from what age or at what stage children can take ultimate control of their learning journey is ambiguous. Diagnostic models and tests largely aim to develop practical instruments for measuring factors that correspond to common traits. For example, Guglielmino's (1977; see also Hoban et al., 2005) self-directed learning readiness scale typically measures how often participants feel positively about major factors (e.g. learner's self-confidence, responsibility; curiosity, motivation), mostly derived from Knowles's (1980, 1984) profile on adult learners.

Further accounts are necessary to explore the developmental trends and discuss when/how children anchor in the characteristics of adult learners, as this study aims to address. Taking a qualitative approach, eight children and five teachers were interviewed during online focus group discussions to achieve this target. Both groups answered the same questions so that the analyses allowed for comparisons as to whether the interviewees had different ideas or whether the degree of expertise played any role in their conceptualization of pedagogical implementations.

The target was inspired from the previous study which showed that highly skilled experts –quantum physicists– criticised formal educational implementations strongly.

Criticisms were particularly intense regarding the high degree of dependence on the centralized curricula and teacher-centered methods. Instead, distrust of ready-made knowledge in science was praised. It was also proposed that learning rather than teaching should be prioritized via an idiosyncratic process that allows for learner-initiated activity (Dündar-Coecke, submitted). Coming from a field where the notion of physical reality is questioned continuously, the strength of the physicists' criticisms may project their mastery level. Thus, it was hypothesized that when they are asked about ideal education, experts may have projected their own intellectual competences onto their judgments in a phenomenon called *intellectual mirroring*, which implies that highly skilled experts may reflect their mature thoughts, knowledge, self-confidence, or expertise in their judgments, and this may upraise the bar for more immature learners. The purpose of the study was therefore to investigate to what extent intellectual mirroring has been hampered by an over-reliance on pedagogical or andragogical insights. By looking at other experts' –teachers– opinions comparatively with students', it was targeted at elaborating on whether the nature and intensity of criticisms differed depending on age, expertise, or domain knowledge.

Methodology

Using the qualitative research paradigm, the present study replicated the methodology of the previous study (Dündar-Coecke, submitted) to obtain students' and teachers' views in a similar semi-structured interview form. The purpose was to examine deeply the meaning of participants' explanations (Morrow, 2005). The participants were probed spontaneously using 'why' and 'how' questions as the methodology allowed over the flexible discussions (Krueger, 1994; Strauss & Corbin, 1990).

Participants

The qualitative data were obtained using the focus group interview method. A small group design was preferred due to the online nature of the meetings to allow each participant to have a longer speaking time (see Millward, 2006, for the group sizes). Student data were collected from two meetings. Care was taken for participants to be studying at different schools to ensure a level of representativeness. Students' ages ranged between 11 to 16. The sample included two 16- and two 14-year-olds, otherwise the age ranged equally. Five teachers were interviewed individually due to limitations in their time commitments in organising a joint meeting; one teacher working at a primary school (Year 5) and three working in the secondary school (Math, English, Chemistry) in the UK school system. The study employed purposive sampling based on the three criteria: willingness of the participants, their availability, and expertise in the field, such as either being a student or holding a teacher role.

Materials

A semi-structured interview form was used to collect the data. The questionnaire included four questions following an introduction. All groups received the questions in the same order, and spontaneous questions were asked where it was necessary. The semi-structured interview questions for students and teachers were as follows.

- Do you think that you (/students) have the knowledge and ability to plan and conduct your (/their) learning?
- Do you think that you (/students) can identify your (/their) own learning targets?

- Can you (/students) direct your (/their) learning independently, or prefer someone to guide you (/them)?
- Do you think that you (/students) can renew your (/their) motivation yourself (/themselves) for learning topics?

Procedure

During the interviews, the researcher acted as a moderator to orchestrate the data collection process and increase coherence across the stages. This process started with the preparation of the interview agenda, which included details about the date, time, and the technical organisation of the online meetings by using the Zoom online meeting application. Following the agenda, the participants received an introductory explanation of the following aspects: the motivation behind the study, the key topics to be explored, expected outputs, importance of these outputs for the field (i.e. who may need these outputs, how, and for what purposes?), and privacy (i.e. anonymising the data, how confidentiality is ensured). Individual permissions were also sought for the audio-recordings regarding the reliability of the analyses. The meetings did not start before the verbal permissions of each participant.

During the discussions, the participants were encouraged to take turns and discuss the questions in a fluid structure. They were also encouraged to be explicit about their opinions with the statements made by the researcher indicating that every thought is valuable, everyone should feel fully independent, and there is no right or wrong answer, but complete freedom. In addition to the audio-recordings, the researcher took notes based on immediate observations while administrating the group dynamics. Two different sessions totalling two hours were recorded. For the individual sessions with teachers, the participants received the same questions. Due to lack of consent, only one teacher's views were audio recorded; for the rest the researcher took notes in detail.

Data Analysis

The data were analysed using the content analysis method, which was started by classifying the categories and global themes derived from the research question. Then each category was divided into sub-themes that elaborated on the relevant concepts and codes. The first step was to review the recordings and notes taken during the meetings and interviews, and then to consider what main themes had emerged.

For the thematic analysis, Braun and Clarke's (2008) step-by-step analysis method was utilized. This method guides the six stages in conducting thematic analysis, starting from familiarization with the data; initial code generation; further reading of the transcripts and notes; definition of the themes; naming and revising of the themes; and reporting. Following this pathway:

1. The researcher read the transcriptions and notes of interviews, highlighted the most relevant sentences with relation to the research question.
2. The transcriptions and notes were re-examined for possible coding categories. Each sentence was cross-checked against the other by giving consideration to their meanings.
3. The left-hand margins were used to allow the researcher to establishing an initial list of codes for conceptual frameworks as suggested by Miles and Huberman (1984).

4. An open coding paradigm was employed during the re-examination process, enabling conceptual labels to be placed upon significant statements and then grouping these labels together to create initial categories following Strauss and Corbin's (1990) recommendations.
5. The category list enabled the researcher to reduce the number of categories by collapsing those that were similar or dissimilar into broader higher order categories.
6. The final version of the coding list refined the initial themes/categories, and clustered them appropriately by taking into account the research question for each data set.

Validation Strategies

A time triangulation strategy was used to robust the validation, credibility and rigor of each data set. The time triangulation technique enabled the researcher to complete the coding processes without a break: after completing the initial analysis, the researcher re-examined the above-mentioned thematic analysis once over three consecutive weeks of time for each data set. Each time the full scope of the analysis was re-examined as recommended by Creswell and Miller (2000).

Results

The following figure comparatively illustrates the teachers' and students' themes, categories and subthemes obtained from the thematic analyses.

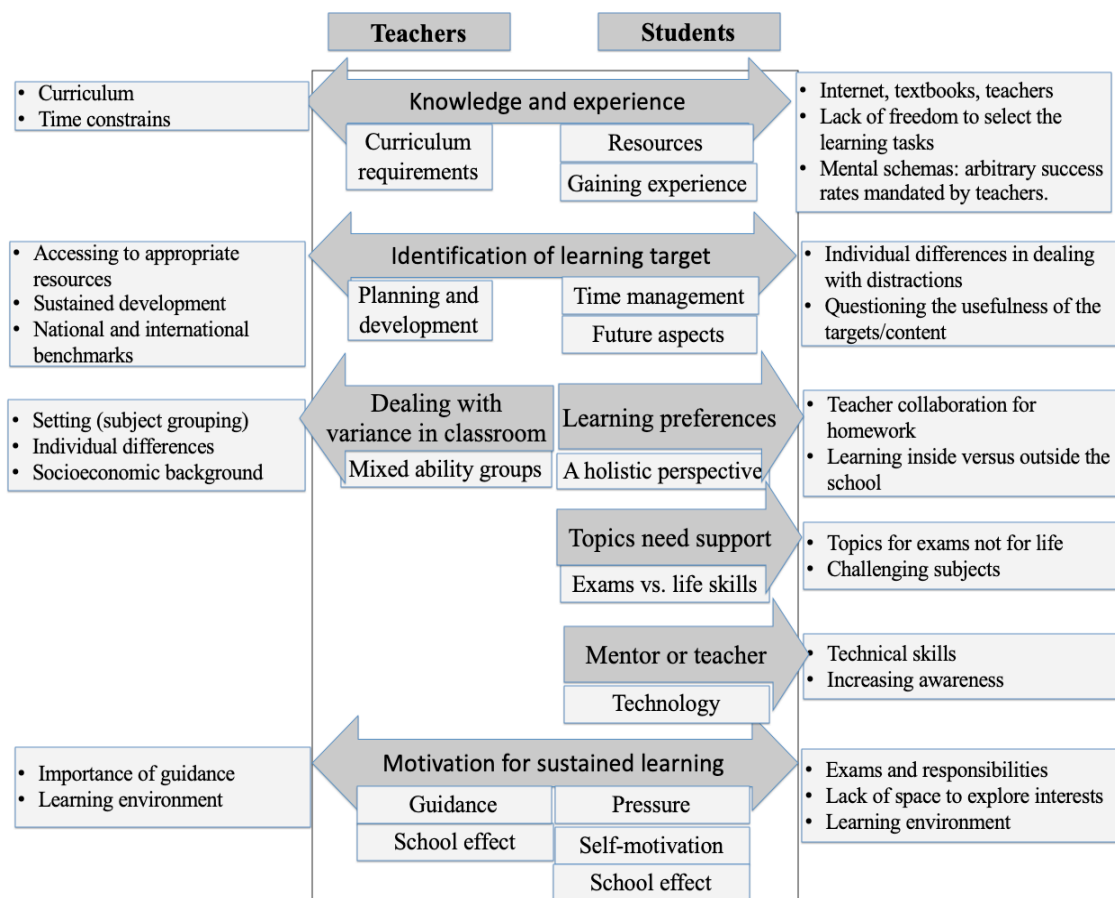


Figure 1. The themes and categories of students vs. teachers

The qualitative analysis reported two groups of interviewees views under the relevant categories and themes. Direct quotations ensured the minimization of the personal bias of the researcher. This was demonstrated by bracketing, which represented self-awareness of the mindset of the researcher.

Student data

As illustrated in Figure 1, in total 6 global themes and 10 categories produced 14 sub-themes for the student data. Direct quotations were coded by using students' role (S= Student) and their age (e.g. S, 12).

1. Knowledge and skills

The first global theme had two categories underneath, namely 'resources' and 'gaining experience'. Regarding the first theme (resources), students stressed the importance of the internet in improving them the knowledge of topics that they are interested in. In particular, the older ones showed the self-confidence to direct their learning independently.

"Depending on how passionate I am about the topic, internet or textbooks are helpful. I believe that I have the knowledge and skills to use these resources independently." (S, 16)

"In schools, teachers always have ideas about what you should know. When I like the topic, I prefer to move forward independently." (S, 16)

Students agreed that the variety of resources is important to plan and conduct their learning. However, their opinions regarding the implementations varied. In particular, younger children continued to emphasize the role of teachers, while older students were more critical about teachers and the system. Lack of freedom to select the learning tasks/topics were stressed as another subtheme.

"Most topics I am interested in are not under GCSE options or curriculum. The basic core topics of the GCSE are English, maths, science." (S, 14)

One student mentioned that they believed the mental schemas of teachers resulted in the attainment of arbitrary success rates depending on the racial or socioeconomic background of students.

"Some teachers have strong mental prejudices depending on students' socioeconomic background or gender or nationality. They reflect their feelings to students in the class by putting biased or arbitrary success rates." (S, 16)

This point attracted the attention of the interviewees. At the end, they decided that teachers' behaviour may change, depending on the school catchment area.

2. Identifying own learning target

Under this global theme, two categories and three sub-themes emerged. The first category was 'time management' in directing one's own learning. The second category was named 'future aspects', which compiled students' criticisms and questions. Under the first category, all students agreed that identification of learning

targets requires time management skills and planning. Distractions were referred to as challenging: *“Time management is a skill. I get distracted easily outside school. But we are not used to learn outside the school. This may be the reason.”* (S, 15).

“Is playing football or taking pictures a distraction? If yes, I’m easily distracted outside the school. I would prefer spending my time for those if I don’t go to school. But in the school, friends are also distractive.” (S, 16)

Young children seem to be more obedient. They were also less critical about teachers setting the targets: *“If I need to set my target it needs a lot of time management skills. You need to know exactly what you are doing.”* (S, 14)

“I am not used to have that much freedom. I don’t know how to plan and manage my learning.” (S, 11)

Particularly older students questioned the future contexts of the learning targets. *“I study economics, and there are certain subjects that excite me, but I am not allowed to focus. Schools and exams expect us to have a baseline in all subjects, but we need more freedom in choosing our targets.”* (S, 16).

3. Learning preferences

This global theme produced one category and two sub-themes underneath. A need for a holistic perspective was stressed by all students. Young students seemed to feel comfortable with the idea of learning from their teachers as the main source: *“I try to learn in the school. We don’t have enough opportunities available outside.”* (S, 13)

However, even young ones displayed some criticisms, while older students showed strong preferences towards self-directed learning.

“Most teachers don’t talk to each other, and they end up giving us too much homework. If they can connect learning activities in a more meaningful manner to us, they can support my learning more effectively.” (S, 11)

“Teachers should give more options to students like what to focus and how. For example, if a student is interested in media, which is not under the GCSE topic, teachers do not support that.” (S, 15)

4. Topics needing support

Under this global theme, one category and two subthemes emerged, namely ‘topics for exams, not for life’, and ‘challenging subjects’. Regarding the former, some students highlighted that exams are not part of real life. *“I don’t like the idea that I have to learn for the exams, not for life.”* (S, 14)

“Most stuff I learn in the school is just useless.” (S, 15)

Challenging subjects were acknowledged. Students highlighted that most of them do not know what to do or which subject to focus on until the year of 10 or 11. Thus, guidance until these levels is found to be crucial unless they have strong ideas about

what topic to focus on. *“The process is a lot harder for Year 9, as you get all foundational information for the GCSE which effect your next two/three years massively.”* (S, 15).

5. Mentor or teacher

This global theme produced one category and two sub-themes, namely ‘technical skills’, and ‘increasing awareness’. All students declared that technology use is the key for their learning as an alternative to teacher instruction. *“For most tasks, we need internet or technical skills.”* (S, 14)

Younger students seem to think that they have the skills. Online learning does not require skills, but it requires device and memberships. They appear to be more open for receiving instructions to increase their awareness. *“To search from the internet, you need to have the device first.”* (S, 13)

6. Motivation for sustained learning

This theme produced three categories and three sub-themes underneath, namely ‘exams and responsibilities’, ‘lack of space to explore interests’, and ‘learning environment’. Students' thoughts were quite diverse. Some of them focused on exams and job opportunities as motivators; some of them had to think about the sources of their motivation. But all agreed that even if they didn't go to school, they would continue to learn something new. Regarding the ‘pressure’ sub-theme, they seem to accept a certain level of pressure as helpful in motivating them to engage with schoolwork. *“If we don't have the pressure of exams, teachers etc., this may change my learning.”* (S, 13)

“If you let us be, we may lose the motivation to learn school topics, but do other works that we like.” (S.16)

Some of them emphasized individual differences. *“It comes down to the personality. Some people like pressure or being scared. Some people like to be independent and relax. I prefer a balance, half and half.”* (14)

On the other hand, 7 out of 8 students think that they don't have a space to think about their interests. *“Self-motivation is a skill that everyone needs to develop. If I get pressed by the teachers, I get stressed, cannot work properly. Probably I have that skill and need more useful information to build my future.”* (S, 14).

Regarding the school effect, most young children underlined the positive impact of the school on their learning motivation. *“I prefer to learn in the school. It motivates me better.”* (S, 12)

Teacher data

From the analysis of the interviews and hand notes, 4 global themes, and 5 categories produced 10 sub-themes for the teacher data. Figure 1 provides a list of teachers' themes and categories obtained from the thematic analyses. In the analysis below, each participant was coded by using their profession (T= Teacher) and school level

they work (P=Primary; S=Secondary).

1. Knowledge and experience

This global theme produced one category and two sub-themes underneath, namely 'curriculum' and 'time constraints'. Regarding the former, teachers expressed that the national curriculum is a reliable guidance for knowledge and experience development. *"Of course, we have a national curriculum to set educational attainments in a more standardized manner throughout the years of schooling. It encourages us to quantify the outcomes that can be used in internal and external evaluations at the school and regional levels."* (T, P)

Time restrictions in achieving the targets was seen as a challenge. Some teachers seem to be more critical about the overcrowding in the program. *"We face many challenges to deliver effective, solid, and in-depth teaching. Sometimes, it feels like it is a frantic gallop."* (T, S)

2. Identification of learning target

Under this global theme, one category and three sub-themes emerged. Teachers mostly emphasized the aspects of planning in supporting students' development. Three sub-themes revolved around 'accessing appropriate resources', 'sustained development', and 'national and international benchmarks'. Regarding the first, all teachers showed confidence in the content they have been delivering and how. *"Students can easily get lost if you don't guide them. Particularly, on secondary school level what would be needed is putting together the tasks for each subject and linking those to other resources, including online."* (T, S)

Within the scope of the second subtheme, sustained development was the focus. Despite centralized curriculum guidance, teachers stressed the role of school-, pupil-level, and self-evaluations for sustained development. *"Yes, national curriculum guides us, but it requires us to set our own targets for each subject as part of our school development plan."* (T, P)

"Target setting is at the heart of our job. We offer individualised learning plans depending on learners' unique nature (hobbies, interests etc.), a route through the programme. This is a job for professionals that requires training and practices, in which students have very limited capacities." (T, S)

The third sub-theme, national and international benchmarks, was highlighted by all teachers. Most teachers found exams to be a useful way to benchmark their and their students' performances within and between the schools. *"Results are generally reassuring. Exams are also useful to modify the teaching methods and re-evaluate the targets."* (T, P)

"We are also under the pressure of national and international benchmarks; exams are not just for students." (T, S)

3. Dealing with the variance in the classroom

This global theme produced one category and three sub-themes underneath, namely 'setting', 'individual differences', and 'socioeconomic background'. All teachers mentioned the complex nature of classroom and individual differences. *"Classroom is a heterogeneous environment that each student is initially randomly allocated."* (T, S)

"We make effort to reduce the disadvantages and equalize the start conditions for everyone." (T, S)

Teachers stated that the variance in students' abilities can be large in the same class. Setting (subject grouping) is one way to orchestrate the mixed ability groups. *"Although it is common to group children based on their interests in art, sport, or music, it is hard to extend it to the core topics, such as mathematics. Yes, there are a number of flexible forms of grouping in this context, but it is still challenging to address the targets at class level."* (T, S)

One of the teachers drew attention to the impact of children's socioeconomic background. *"Students' home environment varies largely. You can easily observe the impacts of their home environment on their interests and attainments."* (S, P)

4. Motivation for sustained learning

The last global theme produced two categories (guidance, school effect) and two subthemes underneath, namely 'importance of guidance' and 'learning environment'. Regarding the first, teachers seem to believe that they have a major role in maintaining students' motivation. *"I am sure that students can maintain their motivation for learning, but only a few ones keep up with the core topics, such as maths"* (T, P)

"We use many strategies to create and maintain students' motivation in classroom. Yes, some students can be highly motivated, but my effect is highly remarkable too in keeping them on track." (T, S)

School effect was another category, stressing the impact of the learning environment. *"I agree that we need to give students much control over their own learning. But, I know even from my own child that she needs the school atmosphere to maintain her focus on cognitive tasks"* (T, S)

Discussion

From a developmental viewpoint, it is worth knowing from what age children can steer their learning journey and anchor in the characteristics of adult learners. The present study aimed to explore this query and capture these characteristics by asking teachers and students; and showed that different parties' views on the same questions can differ largely. Looking at the first global theme, teachers seem to perceive themselves as the main source of knowledge development, while students acknowledge the role of different types of resources in knowledge construction. Within the second global theme, unlike students, teachers did not mention the future

aspects of students' learning. National and international exams drew the teachers' attention, while students questioned the usefulness of the content they are exposed to. The issue of dealing with mixed abilities (by teachers) sits in contrast with concerns over learning preferences in students. The parties' understanding of life skills seems to differ too. However, the theme of motivation for sustained learning produced one similar category, namely school effect and both parties provided similar opinions about it. Overall, differences between the two groups can be pinpointed as follows:

- Both teachers and students rarely talked about interests in school subjects, but they mostly talked about exams and responsibilities.
- While younger students declared that teachers set them to work, older students analysed the value of the work itself in the context of life and future targets. Substantially so, teachers were viewing the school subjects as a measure of success.
- Teacher guidance was welcome for all ages (e.g. *teachers as pinpointers*). However, students expect not only instruction, but an array of opportunities and support for their learning.
- Most students declared/agreed that they are trained to motivate externally. All participants agreed that motivation requires some support, but older students showed desire to nurture their own interests and had strong criticisms of school-type restricted subjects.
- Students, particularly older ones (15/+), seem to be more critical about pedagogical implementations, particularly when the content is embodied with teacher directed learning.
- The learner's lack of responsibility for making decisions about what will be learned, how it will be achieved, and when, were all under the scrutiny of secondary school students, in a more critical manner than at primary age.

Older students' criticisms were largely in accord with the physicists' views elaborated on the previous study (Dündar-Coecke, submitted), where negative effects of intensive teaching and easily available ready-made information (e.g. introducing content via schoolbooks) on students' knowledge construction were discussed. A suggested alternative framework was *inferential comprehension*, which focuses on developing learners' ability to question existing models, encouraging learners to test them, fostering a habit of researching from a variety of resources, and ultimately, refining ideas and constructing the digested knowledge. Inferential comprehension takes a stance against conventional approaches where learners are perceived as novices. In this present study, although none of the participants mentioned this concept explicitly, students' criticisms were highly similar to those of physicists, particularly when it comes to the function and methodology of teaching: specifically, if the content is seen as being traditionally translated from teachers to immature students. As opposed to the teachers, from the students' point of views intellectual mirroring may not be the consequence of domain specific knowledge, expertise, or age.

These results provide a basis for a large-scale investigation rather than being conclusive. Although particularly older students seemed more capable to take the lead of their learning or explore the alternative forms of developing learning styles independently, further studies are needed to investigate the generalizability of the outcomes.

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