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**An Analysis of Students' Spontaneous Computer-Mediated Help Seeking:  
A Step Toward the Design of Ecologically Valid Supporting Tools**

Minna Puustinen<sup>ab</sup>, Olga Volckaert-Legrier<sup>a</sup>, Danièle Coquin<sup>a</sup>, and Josie Bernicot<sup>a</sup>

<sup>a</sup>University of Poitiers & CNRS (UMR 6234 CeRCA), France

<sup>b</sup>IUFM Nord-Pas de Calais, France

Corresponding author:

Minna Puustinen

Université de Poitiers & CNRS

Centre de Recherches sur la Cognition et l'Apprentissage (UMR 6234 CeRCA)

MSHS

99 avenue du Recteur Pineau

86000 Poitiers

France

Telephone: +33-1-60.71.82.61

Fax: +33-5-49.45.46.16

Email: minna.puustinen@univ-poitiers.fr

Email addresses of the other authors:

o.volckaert@gmail.com

daniele.coquin@mshs.univ-poitiers.fr

josie.bernicot@univ-poitiers.fr

### Abstract

This study analyzes middle school students' spontaneous mathematics-related help-seeking behavior, in view of making ecologically valid recommendations for the design of supporting tools or "help systems". Our aim was to investigate the content of students' help-seeking messages – Are there different forms of help-seeking messages and do they evolve with age? We used the archives of a French forum that provides students with free individualized help in mathematics. The data consisted of 206 messages sent by French middle school students over a period of 42 months. The constituent categories of the messages were identified. The results showed that not all middle school students use the same help-seeking "format". Compared to sixth graders, ninth graders wrote messages containing more constituent categories, i.e., they provided the online expert with more kinds of information. A detailed analysis of the categories further showed that older students' messages more often contained explicit help requests and contextual information than did younger students' messages. Thus, the messages of the oldest students' (age 15) were both cognitively more understandable and socially more acceptable than those of the youngest students (age 11). The interpretation of these findings and their implications for designing help systems are discussed.

### Keywords

computer-mediated communication; distance education and telelearning; media in education; pedagogical issues; secondary education

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## 1. Introduction

Since the beginning of the 1980's (Nelson-Le Gall, 1981, 1985), instrumental help seeking (i.e., asking for a hint or an explanation in an attempt to understand a problem-solving principle) is described by educational psychologists as an adaptive learning strategy, and at present, this kind of selective help seeking is regarded as a strategy for self-regulated learning (Karabenick & Newman, 2006; Puustinen et al., 2008). Learners who decide to ask a more competent person for an instrumental type of assistance when faced with a task that is too difficult for them thus demonstrate their desire to take charge of their own learning (Karabenick, 2006; Puustinen, 1998). In Vygotskian terms, they are situated within the zone of proximal development: thanks to help provided by an expert (for a definition of the term "expert", see for example Bromme, Rambow, & Nückles, 2001), they will be able to perform a task they were not yet capable of performing by themselves (Puustinen, 1998).

From the very beginning of educational applications in information and communications technology (ICT), computerized learning environments have proven difficult to use without help or assistance (Keefer & Karabenick, 1998). Since the 1970's, two principal types of computerized learning environments have emerged, namely intelligent tutoring systems and discovery (or inquiry) learning environments. More recently, the Internet and remote communication devices have led to the development of a third broad category of computerized learning environments, namely computer-supported collaborative learning environments (Bruillard, 1997). These various types of environments are generally based on the idea that users are self-regulating, that is, that they autonomously take charge of their own learning. At the same time, however, the notion of help is omnipresent in educational ICT;

only discovery learning environments were initially designed without a "help function"<sup>1</sup>. It turns out that having such an autonomous and self-regulated attitude towards learning is not easy, and in reality, it is necessary to provide users with guidance or assistance that enables them to learn on their own (Baker, Puustinen, & Lund, 2002).

If learning outcomes at least partly depend on available support, then the quality of the help provided becomes an important issue in the field of educational ICT. Several characteristics (e.g., accessibility, user friendliness) can be listed, and one of the main qualities of "good" help is certainly its relevance, that is, *the degree to which it corresponds to the learner's real needs*. Designers have various solutions at their disposal for enhancing relevance. For example, they can decide what information is necessary or relevant for a given task on the basis of a teacher's analysis of frequently made errors. This approach is reminiscent of classical work on tutoring (e.g., Wood, Bruner, & Ross, 1976) in which *tutors* use various cues (e.g., the learner is stuck on some difficulty) to decide when and how they will start helping the tutee.

An analysis of students' spontaneous or naturally occurring instrumental help seeking — which reliably reflects their needs — constitutes a complementary approach to the problem. Instrumental help seeking can in fact be seen as a kind of tutoring, but in the case of help seeking, the *tutees* are the ones to decide when and how they want to be helped. In other words, the interaction is initiated by the tutee, not by the tutor (Puustinen, 1998).

This being the case, an analysis of students' spontaneous computer-mediated help seeking might contribute to improving the quality of online help. Such an analysis would

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<sup>1</sup> The learner was supposed to act as a scientist who discovers the laws and the rules of a domain (de Vries, 2003). However, the "scientific" learning method turned out to be difficult, and its designers soon agreed on the necessity of providing learners with some kind of instructional support (for more details, see e.g. Veermans, de Jong, & van Joolingen, 2000).

show what, when, and how students ask for help if they have the opportunity to formulate their requests freely. However, there are few (if any) analyses of students' computer-mediated help seeking in the literature. Most studies in this field (e.g., Alevan, McLaren, & Koedinger, 2006; Bartholomé, Stahl, Pieschl, & Bromme, 2006; Luckin & Hammerton, 2002; Wood & Wood, 1999) analyze human-machine interaction rather than computer-mediated human-human interaction. In other words, help is not provided by a human tutor but by the computer, and the "request for help" often amounts to the learner's decision to click (or not click) on an icon located on the screen. The objective of the present study was to fill this knowledge gap by analyzing students' spontaneous computer-mediated help seeking addressed to a human tutor. We decided to focus our analyses on middle school students' help-seeking behavior because few studies have specifically analyzed that age group, despite the fact that it constitutes one of the most active populations with respect to the use of new technologies.

This approach has a major advantage: it allows us to bypass problems traditionally related to the ecological validity of help-seeking results. A number of researchers (e.g., Newman, 2002; Puustinen et al., 2004) have raised the question of the ecological validity of the results of help-seeking experiments. For example, several studies have used questionnaires to investigate students' *intentions* to seek help, even though it has been demonstrated that such measures do not necessarily correspond to a learner's actual behavior in learning situations (e.g., Winne & Jamieson-Noel, 2002). Natural data, that is, students' spontaneous help seeking, is better at reflecting students' actual needs and behaviors than any other type of data. In order to further support the ecological validity of our results, our analyses focus solely on mathematics, shown to be among the disciplines that trigger the most help seeking at school (Nelson-Le Gall & Glor-Scheib, 1985).

Because of the originality of our approach and the lack of existing references and results on this topic, our study was aimed at answering the following two questions:

(1) *Are there different forms of help-seeking messages, or do all middle school students spontaneously use the same "format" to ask for help?* For example, do all students simply send their mathematics homework to the tutor along with a request for help detailing their questions or difficulties? This form of help-seeking message can be qualified as cognitively understandable (see Bernicot, 1991; Goffman, 1967), i.e., only the "head act" (Blum-Kulka, House, & Kasper, 1989) of the help-seeking message or the "core" elements needed by the tutor are included. Or do some students also make their messages socially acceptable (see Bernicot, 1991; Goffman, 1967), i.e. polite and contextualized, by adding some "non-essential parts" to the core elements (see Blum-Kulka et al., 1989)? In a related domain, previous research on oral and written interactions (e.g., Laver, 1981; Sacks, Schegloff, & Jefferson, 1974; Volckaert-Legrier, Bernicot, & Bert-Erboul, in press) has shown that a standard format exists for social interactions (e.g., one typically begins by initiating the interaction and finishes by closing it in one way or another). Will this rule apply to our real-world data?

(2) *If different forms of help-seeking messages exist, do they evolve with age (here, during the middle school years)?* Our previous studies (Puustinen, 1998) have shown how student help-seeking behavior develops during the elementary school years. In particular, we found that fourth graders — especially high achievers — were capable of using help seeking as a self-regulated learning strategy in a problem-solving situation. It seems plausible that the use of a help-seeking strategy might continue to develop after the elementary school years too. First of all, computer-mediated help seeking has some features that distinguish it from "traditional" help seeking (see Alevan, McLaren, Roll, & Koedinger, 2004). For instance, instead of asking for help orally from someone who is physically present, students seeking computer-mediated help most often send a written message to an (unfamiliar) "expert" who is not present. In an online help-seeking situation, then, we need to consider not only the impact

of age, but also the role of computer-mediated communication (CMC) skills, which are acquired through practice on new media. Although school provides all adolescents with equal access to instruction and experience with the conventional written language, this is not true for CMC skills, which are learned via a more personal route. Beach and Lundell (1998) showed how CMC experience among 12- and 13-year-old middle school students actively engaged them in reading and writing, considered as social communication strategies, and that CMC skills had an impact on reading and writing. Volckaert-Legrier, Bernicot, and Bert-Erboul (in press) obtained similar results in the domain of email use. Moreover, research on both oral (e.g., Bernicot, Laval, & Chaminaud, 2007) and written language (Berman, 2005) has recently shown that (pre)adolescence is an important period from the developmental point of view. Finally, Demetriou (2000) showed in a related domain that planfulness, which reflects long-term or strategic self-regulation, continues to develop during the middle school years.

## **2. Method**

### **2.1. Participants**

We used natural data, that is, the archives<sup>2</sup> of SoS-Math, a French forum offering students individualized help in mathematics, free of charge. Our data consisted of middle school students' messages ( $n = 206$ ) from the SoS-Math archives sent between January 2002 and November 2006. Only those messages in which the students explicitly stated they were attending one of the four grades of French middle school<sup>3</sup> (corresponding approximately to

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<sup>2</sup> With the permission of the Director of the Regional Board of Education of Poitiers, France.

<sup>3</sup> In France, compulsory education begins at the age of 6 and comprises 5 years of elementary school (called CP, CE1, CE2, CM1, and CM2) and 4 years of middle school (called 6ème, 5ème, 4ème, and 3ème).

ages 11 to 15) were included in the analyses. There were a total of 21 sixth graders, 25 seventh graders, 71 eighth graders, and 89 ninth graders in the study.

## **2.2. Procedure**

Students are free to go to the forum (<http://sgbd.ac-poitiers.fr/sosmath/index.php>) whenever they feel the need (i.e., at school during a break, at home, etc.), and they type their messages online (Roser, 2003). Voluntary middle school mathematics teachers take turns replying to the students' messages seven days a week (except during summer vacation). The teachers also act as forum moderators (e.g., they may decide not to display an undesirable message; Coquin, 2006). According to the rules of the forum, the teachers' role is to help the students do their homework (i.e., provide instrumental help), not to do the problems for them.

## **2.3. Coding**

Because of the absence of available results on the form of students' spontaneous written computer-mediated help-seeking messages addressed to a human tutor, we began by operationalizing the concept of "form". This required several phases. First we chose a unit of analysis. We considered "the proposition" to be a more suitable unit for our data than "the utterance" (see for example Graesser, Person, & Huber, 1992) because of the characteristics of natural data (e.g., heterogeneous use of traditional phrase structures or grammar rules). Then we conducted a propositional analysis in order to cut the data into segments (i.e., propositions). Next, we conducted a content analysis aimed at distinguishing the different parts – which we called constituents – of the messages. Last, we assigned each proposition to one of the constituent categories.

In the propositional analysis (for examples of messages and how they were coded, see Tables 1 and 2, respectively), each proposition was defined by a verb and its arguments, and corresponded to a single event (Reilly et al., 2004). In other words, a long and/or complex sentence (e.g., "I know it seems easy to you but for me it's catastrophic.") was considered to

represent several events, so it was counted as several propositions (I know// it seems easy to you// but for me it's catastrophic). Proposition-coding reliability was estimated by having two coders independently assess the same, randomly selected cases (10% of the data). The inter-rater reliability rate was 92%.

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 Insert Tables 1 and 2 about here  
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In the analysis aimed at identifying the *constituents* of the messages (for coding examples, see Table 2), a total of eight constituent categories were identified. They included three "core" elements that made the message cognitively understandable (Bernicot, 1991; Goffman, 1967):

- the *problem* the student was having trouble solving (e.g. "Simplify  $B=5b+(2-3b)-(b-3)$ ", "A mother age 37 has 3 children ages 8, 10, and 13. In how many years will the mother's age equal the sum of her children's ages?", "Given segment [AB], use a compass and a non-graduated ruler to divide the segment into seven segments of equal length", or "A bookseller decides to raise all his prices by 15%. What will be the new price of a book that used to cost (a) 16 euros? (b) 20 euros? (c) 22 euros?");
- an *explicit request for help* (e.g. "SOS", "How should I do this problem?", "How do you add and subtract fractions?", "I hope you'll be able to enlighten me on this question", "What is central symmetry?", or "Should I answer -3600 or 3600 m?");
- some signs of preliminary *personal work* on the task, such as comments on methods already tested or answers already found (e.g. "I got  $-900+3*(-900)=-3600$ ", "I think there are an infinite number of values", "I suggest  $A = \text{square root of } 9 \times 20 + \text{square root of } 45$ .  $A = \text{square root of } 180 + \text{square root of } 45$ .", "I found 180 m for the length of the parcel", or "I got  $\frac{2}{3}$  of three quarters =  $\frac{9}{8}$ . That makes  $\frac{99}{56}$ ").

We also identified five "non-essential" categories which made the help-seeking messages socially more acceptable and thus contributed to "engaging" the tutor or tempting him/her to help the student (see Bernicot, 1991; Goffman, 1967):

- *openings* (e.g. "Hello" or "Hi");
- *closings* (e.g. "Bye" or "Bye for now");
- information about the *student's identity* (e.g. "My name is Marie" or "I'm in sixth grade");
- information about the *context* in which the student's message was sent (e.g. "I have a some homework I can't do", "I haven't learned this yet", "I have trouble understanding algebra", "This is my homework for tomorrow", "I'm stuck", or "It's very urgent");
- *politeness markers* (e.g. "Thank you" or "Thank you in advance for your help").

Each proposition was then assigned to one of the constituent categories. A given help-seeking message sent by a student could contain several propositions belonging to the same category (for example, several propositions about the problem). Constituent-coding reliability was estimated by having two coders independently assess the same, randomly selected cases (10% of the data). Ninety-three percent of their codings were identical.

#### **2.4. Data Analysis**

We first tested our hypothesis using an ANOVA, with the total number of constituent categories as the dependent variable and the school grade as the independent variable. Then a more detailed analysis on each of the eight constituent categories was conducted. Because our research questions concerned the form of help-seeking messages (i.e., how many constituent categories were included in a message) rather than the number of propositions attributed to each category, we dichotomized the categories (i.e., either a category was observed or it was not; see the right side of Table 3 for the proportions of the observed categories) before conducting chi-square analyses. All analyses were run under SPSS software (version 15.0).

### 3. Results

#### 3.1. Descriptive Statistics

Table 3 (left side) provides descriptive statistics for the variables analyzed and for the total number of propositions. The average number of propositions per message was 10.2 (*S.D.* = 9.3). This mean did not vary significantly with age;  $F(3, 202) = 2.46, p = .064$ .

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Insert Table 3 about here

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The observed number of constituent categories<sup>4</sup> in a given message varied between 1 and 7. In other words, there were no messages with all eight constituent types. In 24.3% of the cases ( $n = 50$ ), the students' messages contained a single category. The next most frequently observed cases were messages containing three ( $n = 37$  or 18%) or four ( $n = 38$  or 18.4%) constituent categories. In 9.7% of the cases ( $n = 20$ ), the students' messages contained two constituent categories, in 14% ( $n = 29$ ) they contained five, in 10.2% ( $n = 21$ ) they contained six, and in 5.3% ( $n = 11$ ) they contained seven.

Figure 1 presents the distribution of the number of constituent categories in each age group. It shows that the proportion of messages containing only one constituent category decreased with age (52% in 6th grade, 32% in 7th grade, 25% in 8th grade, and 15% in 9th grade), and that the proportion of messages containing three to six constituent categories increased with age (38% in 6th grade, 52% in 7th grade, 58% in 8th grade, and 71% in 9th grade). Messages containing two or seven constituent categories were equally infrequent in all age groups.

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<sup>4</sup> A constituent category was considered to be present if the message contained at least one proposition that fell into that category.

Insert Figure 1 about here

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When the students' messages contained a single constituent category, that category was "problem" in 74% of the cases and "explicit request for help" in 24% of the cases. In other words, when the students' messages contained only one constituent category, it was virtually always one of the "core" elements needed to make the message understandable (see Bernicot, 1991; Goffman, 1967). In the other cases (i.e., when the message contained two to seven constituent categories), a variety of combinations of categories were observed.

### **3.2. Analysis of Variance**

The results revealed that older students' messages contained more constituent categories than younger students' messages,  $F(3,202) = 3.90, p = .01$ . Pairwise post-hoc comparisons (Bonferroni) yielded one significant result: ninth graders' messages contained more categories than sixth graders' messages ( $p < .05$ ).

### **3.3. Chi-Square Analysis**

The  $\chi^2$ -test revealed that context-related information and explicit requests for help were more frequent in older students' messages than in younger students' messages;  $\chi^2(3) = 10.08, p = .018$ , and  $\chi^2(3) = 18.27, p < .001$ , respectively. An analysis of the adjusted standardized residuals showed that in both cases (i.e., context-related constituents and explicit requests for help), the ninth graders' messages contained more, and the sixth graders' messages contained fewer, of these two types of constituents. The results of the  $\chi^2$ -test were nonsignificant for the other categories.

## **4. Discussion**

The aim of the present study was to analyze middle school students' spontaneous computer-mediated help seeking addressed to a human tutor. We reasoned that because

natural data perfectly reflects students' real needs in terms of help or guidance, using this real-world situation might contribute to improving the quality of online help.

Our research questions concerned both the existence (or non-existence) of different forms of help-seeking messages in middle school students, and the development of those forms with age. The results clearly showed that not all middle school students use the same "format" to seek help. Compared to sixth graders, ninth graders provided the online expert with more kinds of information. While more than half of the sixth graders' messages contained only one constituent category, 70% of the ninth graders' messages contained three to six categories.

A more detailed analysis of the messages further showed that the older students' messages contained context-related information and explicit requests for help more often than the younger students' messages did. This is an interesting finding, because it reveals that in an asynchronous, written-communication situation, only the 15-year-olds were capable of producing help-seeking messages that were both fully understandable and socially acceptable. In synchronous, oral communication situations this ability develops between the ages of five and seven years (e.g., Bernicot, 1991; Bernicot, Laval, & Chaminaud, 2007; Bernicot & Legros, 1987; Bernicot & Mahrokhian, 1989).

Another of our findings differs from results obtained in oral-interaction situations: 98% of the help-seeking messages composed of a single constituent category – quite frequent in the youngest middle school student group – contained what might be called a "cognitive" constituent (i.e., information about the difficult problem or an explicit request for help). In oral interactions, requests are typically context-dependent in the younger age groups (Bernicot, 1991; Bernicot et al., 2007; Bernicot & Legros, 1987; Bernicot & Mahrokhian, 1989). This finding could mean that the characteristics of online help seeking (i.e., the

absence of a physically present interlocutor and the asynchronous nature of the interaction) "hide" the social aspects of the situation from the youngest middle school students.

As far as explicit requests for help are concerned, our results are particularly alarming – a description of the problem and an explicit request for help constitute the "cognitive core" of a help-seeking message, because the message cannot be understood without them. The younger students, who failed to type an explicit request for help in their messages more frequently than the older students did, were thus at a high risk of being misunderstood by the tutor.

There are of course various possible reasons for this behavior. It could be that younger students (as compared to older ones) have more experience with online help systems and therefore "know" that adding context-related information and explicit requests for help to their messages is not a prerequisite of successful help seeking. In other words, they may have developed metacognitive knowledge about the functioning of online help services as a result of their repeated metacognitive experiences. However, the fact that there were far fewer sixth graders than ninth graders in the forum archives (21 and 89, respectively) seems to refute, or at least render less probable, such an interpretation.

Another interpretation of this tendency would be that it reflects the development of age-related metacognitive capacities between the first and last grades of middle school. In line with this idea, older students would better understand that to provide effective help, online experts need to be given both information about the message context and well-formulated help requests. This interpretation seems to corroborate earlier findings on tutoring, which have indicated that young tutors, as compared to older ones, have more difficulty considering the tutoring situation in all its complexity (e.g., Ellis & Rogoff, 1982). From the designer's perspective, this interpretation could mean that students starting middle school are not yet

capable of grasping what information a tutor (or a supporting tool) needs in order to help them in a useful way.

Another possibility is that younger middle school students experience more difficulty in expressing their thoughts and needs than do older ones. Still another interpretation would consist of suggesting that sixth graders, as compared to ninth graders, more frequently "skip" the forum user instructions, which explicitly urge students to state their questions in detail and to give the SoS-Math teacher other kinds of information such as what math lesson their homework is about.

Whatever the interpretation, one recommendation for the design of supporting tools seems obvious: middle school students should not be seen as a homogeneous group. Instead, help systems or other supporting tools designed for that age group should take into consideration the fact that younger middle school students behave differently than older ones when faced with help systems. Older students seem to have a more varied or rich range of constituent categories at their disposal. More specifically, what appears to distinguish the youngest middle school students (11-year-olds) from the oldest ones (15-year-olds) is that the absence of a physically present interlocutor and the asynchronous nature of the interaction seem to cause young students to disregard the interactive nature of online help seeking; consequently, they produce either "minimal" messages containing a single constituent category primarily describing the math problem to be solved, or messages omitting one of the two facets of requests (i.e., cognitive understandability and social acceptability). Thus, it is necessary for designers of such online help systems to incorporate ways of making young middle school students aware of the fact that an online help-seeking forum is a social-interaction situation that shares several characteristics with the kind of oral interactions they learned to master during the elementary school years. More attention should also be paid to explicit requests for help, which contribute to rendering a help-seeking message cognitively

comprehensible by the tutor. An explicit help request should be a mandatory part of every message (e.g., it should be impossible to send a message without a specific request typed into the appropriate area). In addition, the importance of context-related information in a help-seeking message should be brought to the attention of younger students. Even though such information can be qualified as "non-essential" (see Blum-Kulka et al., 1989), its role should not be underestimated for it contributes to "attracting" the online expert and enhancing his/her desire to help the student.

In conclusion, it is important not to lose sight of the fact that these are our very first results that obviously need to be replicated. For example, our data contained many more messages sent by ninth graders than by sixth graders. In future studies, a more homogeneous distribution of the number of participants in the different age groups would be desirable, although the fact that there were fewer sixth graders than ninth graders in the forum archives is an interesting finding in itself: it reflects the fact that in reality, older middle school students more frequently use — and perhaps need — online help services in mathematics than do younger ones.

As stated above, the major advantage of using natural data is that it allows one to avoid problems related to ecological validity. In this respect, our results make a real contribution, as compared to studies using questionnaires for example. At the same time, however, the use of natural data has its limitations. In particular, it was not possible for us to obtain any further information concerning the students' backgrounds, even though it seems crucial to know things like a student's past math achievement and computer-mediated technology skills (e.g., keyboard use, forum participation). Puustinen (1998), for example, showed that academic achievement, even more than school grade, was related to the development of students' help-seeking behavior.

An optimal solution might therefore consist of alternating studies using natural data with those opting for an experimental approach. Results obtained using ecologically valid data could serve as a basis for new experimental studies. In our case, the hypothesis to be tested in an experimental setting might concern the development of metacognitive skills between the first and last grades of middle school. In particular, it would be worthwhile to look into whether a student's past academic achievement or prior knowledge and experience in computer use affects the results. This kind of information is necessary if we hope to contribute to improving the relevance of online help.

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## Figure Caption

*Figure 1.* Distribution (in %) of the number of constituent categories in each age group.

Table 1

*The Data. Examples of Messages Sent by Sixth Graders and Ninth Graders*

Original message <sup>a</sup>	Rough translation
<i>Sixth graders</i>	
<p>Un épicier achète 150 bouteilles de vin à 4.90 euros l'une et 130 bouteilles de Champagne à 15.30 l'une. Son bénéfice sur une bouteille de Champagne est le double de celui sur une bouteille de vin. Le prix total de vente des bouteilles est de 4200 euros. Quel est le bénéfice réalisé sur une bouteille de vin ? Quel est le prix de vente d'une bouteille de vin et d'une bouteille de Champagne ?</p> <p>Arnaud part 10 minutes avant cédric et il arrive 4 minutes avant lui. qui a mis le moins de temps? combien de temps en moins?</p> <p>dire si l'affirmation est vraie ou fausse et expliquer la réponse la somme des arêtes d'un parallélépipède rectangle est égales à la somme des perimetres de ses faces merci</p> <p>Martin achète un magazine à 4 euros et un ballon à 6 euros. Il donne 50 euros à la caisse. Donne 3 exemples d'opérations. Merci pour votre aide.</p> <p>tracer une droite (d) placer deux points A et B qui appartiennent à la droite (d) 2/ placer un point M qui appartient au segment [AB] 3/N est un point qui appartient à la droite (d) mais qui n'appartient pas au segment [AB] placer tel point N 4/ placer un point Q qui n'appartient pas à la droite (d) 5/ tracer en vert la (MQ) tracer en bleul le segment [AQ]</p>	<p>A grocer buys 150 bottles of wine at 4.90 euros each and 130 bottles of Champagne at 15.30 each. He makes twice as much profit on a bottle of Champagne as on a bottle of wine. The total selling price for the bottles is 4200 euros. How much profit does he make on one bottle of wine? What is the selling price of a bottle of wine and of a bottle of Champagne?</p> <p>Arnaud leaves 10 minutes before cédric and arrives 4 minutes before him. who took less time? how much less?</p> <p>state whether the statement is true or false and explain the answer the sum of a rectangular parallelepiped's sides are equal to the sum of the perimeters of its faces thank you</p> <p>Martin buys a magazine that costs 4 euros and a ball that costs 6 euros. He gives 50 euros to the cashier. Give 3 examples of operations. Thank you for your help.</p> <p>draw a straight line (d) draw two points A and B that are on the straight line (d) 2/ draw a point M on segment [AB] 3/N is a point that is on the straight line (d) but is not on segment [AB] draw such a point N 4/ draw a point Q that is not on the straight line (d) 5/ draw in green (MQ) draw segment [AQ] in blue</p>
<i>Ninth graders</i>	
<p>bonjour je m'appelle Matthieu, je suis en 3° et j'ai un problème : je doit</p>	<p>hello my name is Matthieu, I am in the 9th grade and I have a problem:</p>

démontrer que  $x$  est solution de l'équation  $2x^2-26x+72=0$  et  $x$  doit être compris entre 0 et 13. comment dois-je faire s'il vous plaît merci d'avance au revoir

bonjour, voici l'énoncé qui me pose problème, pouvez-vous m'aider, d'avance merci: un terrain rectangulaire est bordé d'une allée de 2 m de large, la superficie de cette allée est de 368 m<sup>2</sup>, on me demande la longueur et la largeur du terrain. j'ai trouvé la longueur du terrain : 180m ensuite je bloque

bonjour, je n'arrive pas à résoudre cette équation  $x(x-3)/2=2[(x-3)(x-7)]X2/2$  et moi j'ai commencé à faire  $x^2-3x/2=(x^2-7x-3x+21)X2/2$ ,  $x^2-3x/2=2x^2-14x-6x+42/2$ ,  $x^2-3x=2x^2-20x+42$ ,  $17x=x^2+42$  et là je ne sais plus comment il faut faire merci de m'aider

Bonjour, on sait que SCB est un triangle isocèle en S tel que  $SC=SB=5BC=6$  tracer la hauteur issue de S et qui coupe BC en I Démontrer que  $SI=4$  j'ai prouvé que SI est la médiatrice de BC et j'ai appliqué le théorème de pythagore et SI n'est pas égale à 4 mais environ à 6 est ce que mon résultat est correcte au revoir et merci d'avance

Bonjour, je suis d'habitude bon en maths mais pour cet exercice j'y arrive pas. C'est le n°34p155 et le livre s'appelle dimathème. On a un triangle ABC, on a tracé les bissectrices et le cercle inscrit de centre O. On a l'angle  $AOB = 130^\circ$ . Je dois calculer l'angle ACB. En cherchant, j'ai juste trouvé un angle de  $50^\circ$  dans le cercle. Avant j'ai fait le cours sur le calcul. Merci de m'aider. Clément.

I have to demonstrate that  $x$  is the solution to the equation  $2x^2-26x+72=0$  and  $x$  has to be between 0 and 13. how should I do it please thank you in advance good bye

hello, here is the exercise that's difficult for me, can you help me, thank you in advance: a rectangular lot is bordered by a 2 m wide path, the area of the path is 368 m<sup>2</sup>, they ask me the length and the width of the lot. I found the length of the lot: 180 m then I get stuck

hello, I can't solve this equation  $x(x-3)/2=2[(x-3)(x-7)]X2/2$  and I started to do  $x^2-3x/2=(x^2-7x-3x+21)X2/2$ ,  $x^2-3x/2=2x^2-14x-6x+42/2$ ,  $x^2-3x=2x^2-20x+42$ ,  $17x=x^2+42$  and now I don't know what to do thank you for helping me

Hello, we know that SCB is a isosceles triangle at S such that  $SC=SB=5BC=6$  draw the height coming from S that cuts BC at I Demonstrate that  $SI=4$  I proved that SI is the median of BC and I applied pythagorean theorem and SI is not equal to 4 but about 6 is my result correct good bye and thank you in advance

Hello, I am usually good at math but I can't figure this exercise out. It is No.34p155 and the book is entitled dimathème. We have triangle ABC, we drew the bisectors and the inscribed circle with center O. We have angle  $AOB = 130^\circ$ . I have to calculate angle ACB. While searching, I just found an angle of  $50^\circ$  in the circle. Before I had a lesson on calculation. Thank you for helping me. Clément.

Note. The original French messages are presented as such, that is, the spelling mistakes, capitalization, typing errors, etc. are not corrected.

Table 2

*Coding: Examples of the Propositional Analysis<sup>a</sup> and Constituent Categories*

Proposition	Constituent categories							
	Problem	Explicit requests for help	Personal work	Openings	Closings	Student's identity	Context	Politeness markers
	<i>Message no. 1<sup>b</sup></i>							
<i>Un épicier achète 150 bouteilles de vin à 4.90 euros l'une</i> (A grocer buys 150 bottles of wine for 4.90 euros each)	x							
<i>et 130 bouteilles de Champagne à 15.30 l'une</i> (and 130 bottles of Champagne for 15.30 each)	x							
<i>Son bénéfice sur une bouteille de Champagne est le double de celui sur une bouteille de vin</i> (He makes twice as much profit on a bottle of Champagne as on a bottle of wine)	x							
<i>Le prix total de vente des bouteilles est de 4200 euros</i> (The total selling price for the bottles is 4200 euros)	x							
<i>Quel est le bénéfice réalisé sur une bouteille de vin ?</i> (How much profit does he make on one bottle of wine?)	x							
<i>Quel est le prix de vente d'une bouteille de vin</i> (What is the selling price of a bottle of wine)	x							
<i>et d'une bouteille de Champagne ?</i> (and of a bottle of Champagne?)	x							



Table 3

*Study Variables<sup>a</sup>: Descriptive Statistics for the Observed Data and Proportions for the Dichotomized Constituent Categories*

Variable	<i>M (S.D.)</i>				Percentage of observed category <sup>b</sup>			
	6 <sup>th</sup> ( <i>n</i> = 21)	7 <sup>th</sup> ( <i>n</i> = 25)	8 <sup>th</sup> ( <i>n</i> = 71)	9 <sup>th</sup> ( <i>n</i> = 89)	6 <sup>th</sup> ( <i>n</i> = 21)	7 <sup>th</sup> ( <i>n</i> = 25)	8 <sup>th</sup> ( <i>n</i> = 71)	9 <sup>th</sup> ( <i>n</i> = 89)
Number of constituent categories	<b>2.3 (1.7)</b>	<b>3.2 (1.9)</b>	<b>3.4 (1.9)</b>	<b>3.8 (1.8)</b>	-	-	-	-
Total number of propositions	8.0 (9.2)	6.8 (4.3)	9.3 (6.1)	12.3 (11.7)	-	-	-	-
<i>Number of propositions per constituent category</i>								
Problem	5.2 (8.2)	3.1 (3.1)	5.1 (4.2)	6.9 (9.6)	90.5	76.0	85.9	78.7
Explicit requests for help	0.7 (1.3)	1.1 (1.0)	0.8 (0.9)	1.2 (1.1)	<b>28.6</b>	<b>72.0</b>	<b>57.7</b>	<b>75.3</b>
Personal work	0.2 (1.1)	0.3 (1.0)	0.6 (2.4)	0.7 (2.5)	4.8	8.0	15.5	12.4
Openings	0.2 (0.4)	0.4 (0.5)	0.4 (0.5)	0.4 (0.5)	19.0	36.0	35.2	41.6
Closings	0.0 (0.0)	0.1 (0.3)	0.1 (0.2)	0.1 (0.2)	0.0	8.0	5.6	5.6
Student's identity	0.2 (0.8)	0.1 (0.3)	0.4 (0.8)	0.4 (0.7)	9.5	12.0	25.4	25.8
Context	0.8 (1.6)	0.8 (1.1)	1.3 (1.7)	1.6 (1.8)	<b>28.6</b>	<b>44.0</b>	<b>54.9</b>	<b>64.0</b>
Politeness markers	0.6 (0.8)	1.0 (1.0)	0.7 (0.8)	1.0 (0.9)	47.6	60.0	57.7	71.9

Note. <sup>a</sup> The most significant results (see ANOVA and chi-square analysis) are in bold. <sup>b</sup> The constituent categories were dichotomized (i.e., either the category was present or not) before the  $\chi^2$  analyses were conducted. The column labelled "Percentage of observed category" refers to the cases (%) in which at least one proposition belonging to that constituent category was observed.

