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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte RANDALL BARNHART

Appeal 2017-004776
Application 14/499,659
Technology Center 3700

Before LINDA E. HORNER, LISA M. GUIJT, and LEE L. STEPINA, *Administrative Patent Judges*.

GUIJT, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant[1] appeals under 35 U.S.C. § 134(a) from the Examiner's rejection of claims 1–4, 7–11, 14–18, 22, and 24–28 under 35 U.S.C. § 101.[2] An oral hearing was conducted on February 28, 2019, and a transcript of the

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[1] Pearson Education, Inc. ("Appellant"), the applicant as provided for under 37 C.F.R. § 1.46, is also identified as the real party in interest. Br. 3.

[2] Appeal is taken from the Final Office Action dated June 3, 2016. Claims 5, 6, 12, 13, 19, and 20 were cancelled pursuant to a Response after Final Amendment dated August 26, 2015 (entered by the Advisory Action dated September 9, 2015), and claims 21 and 23 were cancelled pursuant to a Response after Final Amendment dated August 1, 2016 (apparently entered in view of the Notice of Decision from Post-Prosecution Pilot Program (P3) Conference dated August 17, 2016, which lists claims 1–4, 7–11, 14–18, 22, and 24–28 as the rejected claims).

hearing is available in the record (the "Transcript"). We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

STATEMENT OF THE CASE

Claims 1, 8, and 15 are the independent claims on appeal. Claim 1, reproduced below, is exemplary of the subject matter on appeal.

> 1. A method for determining sequences for electronic presentation of electronic educational content objects, the method comprising:
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> receiving, at a server and via one or more uploads from one or more content-provider devices, a set of electronic educational content objects, each electronic educational content object in the set of electronic educational content objects, the server being connected to each of the one more content provider devices via a network;
>
> automatically generating, for each electronic educational content object in the set of electronic educational content objects, metadata for the electronic educational content object that identifies a type of file, from amongst a set of educational-object file types, of the electronic educational content object;
>
> identifying a target proportion of representation of an educational-item file type in the set of educational-item file types;
>
> accessing a past sequence of educational-item file types, the past sequence of educational-item file types including a series of identifiers of educational-item file types in the set of educational-item file types;
>
> for each educational-item file type in the set of educational-item file types:
>
> appending an identifier of the educational-item file type to the past sequence of educational-item file types to produce a potential sequence;
>
> determining an entropy of the potential sequence;

> determining a proportion of the identifiers in the past sequence or potential sequence that identify the educational-item file type; and
>
> determining a score based on the entropy, the proportion and the target proportion for the educational-item file type;
>
> selecting an educational-item file type from amongst the set of educational-item file types based on the determined scores;
>
> appending the past sequence with the selected educational-item file type, such that the selected educational-item file type is associated with a sequence position in the appended sequence;
>
> identifying a plurality of electronic educational content objects from amongst the set of electronic educational content objects, each of the plurality of electronic educational content objects being associated with metadata that identifies the electronic educational content object as being of the selected educational-item file type;
>
> using a pseudo-random selection technique to select an electronic educational content object from amongst the plurality of electronic educational content objects; and
>
> transmitting the electronic educational content object from the server, over the network and to a learner electronic device so as to facilitate an electronic presentation of the electronic educational content object at the learner device after a presentation of one or more other electronic content objects associated with sequence positions before the sequence position in the appended sequence.

ANALYSIS

Appellant argues claims 1–4, 7–11, 14–18, 22, and 24–28 as a group. Br. 14–19. We select claim 1 as representative, with claims 2–4, 7–11, 14–

18, 22, and 24–28 standing or falling with claim 1. *See* 37 C.F.R. § 41.37(c)(1)(iv).

An invention is patent-eligible if it claims a "new and useful process, machine, manufacture, or composition of matter." 35 U.S.C. § 101. However, the Supreme Court has long interpreted 35 U.S.C. § 101 to include implicit exceptions: "[l]aws of nature, natural phenomena, and abstract ideas" are not patentable. *E.g., Alice Corp. v. CLS Bank Int'l*, 573 U.S. 208, 216 (2014).

In determining whether a claim falls within an excluded category, we are guided by the Supreme Court's two-step framework, described in *Mayo* and *Alice*. *Id.* at 217–18 (citing *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 75–77 (2012)). In accordance with that framework, we first determine what concept the claim is "directed to." *See Alice*, 573 U.S. at 219 ("On their face, the claims before us are drawn to the concept of intermediated settlement, *i.e.,* the use of a third party to mitigate settlement risk."); *see also Bilski v. Kappos*, 561 U.S. 593, 611 (2010) ("Claims 1 and 4 in petitioners' application explain the basic concept of hedging, or protecting against risk.").

Concepts determined to be abstract ideas, and thus patent ineligible, include certain methods of organizing human activity, such as fundamental economic practices (*Alice*, 573 U.S. at 219-20; *Bilski*, 561 U.S. at 611); mathematical formulas (*Parker v. Flook*, 437 U.S. 584, 594-95 (1978)); and mental processes (*Gottschalk v. Benson*, 409 U.S. 63, 69 (1972)). Concepts determined to be patent eligible include physical and chemical processes, such as "molding rubber products" (*Diamond v. Diehr*, 450 U.S. 175, 192 (1981)); "tanning, dyeing, making waterproof cloth, vulcanizing India

rubber, smelting ores" (*id.* at 184 n.7 (quoting *Corning v. Burden*, 56 U.S. 252, 267-68 (1854))); and manufacturing flour (*Benson*, 409 U.S. at 69 (citing *Cochrane v. Deener*, 94 U.S. 780, 785 (1876))).

In *Diehr*, the claim at issue recited a mathematical formula, but the Supreme Court held that "[a] claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula." *Diehr*, 450 U.S. at 176; *see also id.* at 192 ("We view respondents' claims as nothing more than a process for molding rubber products and not as an attempt to patent a mathematical formula."). Having said that, the Supreme Court also indicated that a claim "seeking patent protection for that formula in the abstract . . . is not accorded the protection of our patent laws, . . . and this principle cannot be circumvented by attempting to limit the use of the formula to a particular technological environment." *Id.* (citing *Benson and Flook*); *see, e.g., id.* at 187 ("It is now commonplace that an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection.").

If the claim is "directed to" an abstract idea, we turn to the second step of the *Alice* and *Mayo* framework, where "we must examine the elements of the claim to determine whether it contains an 'inventive concept' sufficient to 'transform' the claimed abstract idea into a patent-eligible application." *Alice*, 573 U.S. at 221 (quotation marks omitted). "A claim that recites an abstract idea must include 'additional features' to ensure 'that the [claim] is more than a drafting effort designed to monopolize the [abstract idea].'" *Id.* (quoting *Mayo*, 566 U.S. at 77). "[M]erely requir[ing]

generic computer implementation[] fail[s] to transform that abstract idea into a patent-eligible invention." *Id.*

The PTO recently published revised guidance on the application of § 101. *2019 Revised Patent Subject Matter Eligibility Guidance*, 84 Fed. Reg. 50 (Jan. 7, 2019) ("Memorandum"). Under that guidance, we first look to whether the claim recites: (1) any judicial exceptions, including certain groupings of abstract ideas (i.e., mathematical concepts, certain methods of organizing human interactions such as a fundamental economic practice, or mental processes); and (2) additional elements that integrate the judicial exception into a practical application (*see* MPEP § 2106.05(a)-(c), (e)-(h)). Only if a claim (1) recites a judicial exception and (2) does not integrate that exception into a practical application, do we then look to whether the claim: (3) adds a specific limitation beyond the judicial exception that is not "well-understood, routine, conventional" in the field (*see* MPEP § 2106.05(d)); or (4) simply appends well-understood, routine, conventional activities previously known to the industry, specified at a high level of generality, to the judicial exception. *See* Memorandum.

Step 2A, Prong 1, of the Memorandum: Whether the claim recites a judicial exception

Regarding independent claim 1, the Examiner determines that although the claims recite a method (which is undisputedly within a statutory category), the claims are directed to a judicial exception: an abstract idea.[3] Final Act. 3–4. The Examiner notes that "[t]he majority of the claim

[3] The Examiner provides no further analysis for claims 2–4, 7–11, 14–18, 22, and 24–28. *See* Final Act. 2–5; Ans. 3–8.

limitation[s] seem[] to be directed to a method that calculates and decides the type of educational content object that can be appended . . . in the field of computer . . . training," wherein "the process is computer implemented." *Id.* at 4. The Examiner also determines that claim 1 is directed to "a series of instruction[s] or algorithm[s]" that represent "a type [of] organization and comparison of data *which can be performed mentally*." *Id.* (emphasis added) (citing *Cyberfone Sys., LLC v. CNN Interactive Group, Inc.*, 558 F. App'x 988, 992 (Fed. Cir. 2014) (nonprecedential); *SmartGene, Inc. v. Adv. Bio. Labs. SA*, 555 F. App'x 950 (Fed. Cir. 2014) (nonprecedential)). Thus, we understand that the Examiner rejects independent claim 1 as patent-ineligible because claim 1 is directed to the judicial exception of an abstract idea within the subject matter grouping of mental processes, and more specifically, that claim 1 is directed to a mental process involving a set of instructions for manipulating data to determine a sequence of presenting educational content to a learner in the same way a teacher may mentally classify and select the sequence of educational content for presentation to a student, wherein the set of instructions are simply applied on a computer.[4]

Appellant argues that the claims are "subject matter eligible and do not fall into any exception," in that "none of the claims are directed to an abstract idea." Br. 14; *see also* Transcript 6 ("the two independent claims include a method claim and a system claim, which we believe overcomes

[4] Because the Examiner's rejection places the claims in the judicial exception grouping of mental processes, and not mathematical concepts or certain methods of organizing human activity, Appellant's argument that the claims do not fall into the judicial exceptions groupings of mathematical concepts and/or certain methods of organizing human activity are not persuasive. *See* Transcript 7.

Step 1"). In support, Appellant submits that the Examiner "inaccurately characterizes the claims as 'directed [to] a method that calculates and decides the type of content objects that can be appended'" and "ignores the many other innovative[5] elements of the claims directed to determining exactly why and how the content objects are selected to append." Br. 14. In other words, Appellant submits that the Examiner has "oversimplified" the claims. *Id.* (citing *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327 (Fed. Cir. 2016) (for warning against the oversimplification of claims); *see also id.* at 15 (arguing that the Examiner's determination that "the claims are directed to calculating and deciding the type of content objects that can be appended is greatly over-simplifying the claims"). In particular, Appellant contends that

> claim 1 includes a detailed combination of actions for selecting a file type including determining an entropy, proportion, and score for each of multiple file types to potentially be appended to a sequence. Other claim 1 elements include selecting particular electronic content objects based on: metadata of each of a plurality of content items, the sequence, and a pseudo-random selection technique, and finally, after all of this, sending the selected content object to a learner device. These technical features extend well beyond merely calculating and deciding the type of content objects that can be appended.

Id. Appellant concludes that, similar to *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245 (Fed. Cir. 2014), "the claims set forth a sophisticated

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[5] Notably, "[e]ligibility and novelty are separate inquiries." *Two-Way Media Ltd. v. Comcast Cable Comm'ns, LLC*, 874 F.3d 1329, 1339–40 (Fed. Cir. 2017); *see also Affinity Labs of Texas, LLC v. DIRECTTV, LLC*, 838 F.3d 1253, 1263 (Fed. Cir. 2016) (holding that "[e]ven assuming" that a particular claimed feature was novel does not "avoid the problem of abstractness").

ordered combination of steps that rely on computer functions to overcome a technical problem of selecting a file type and electronic content object." *Id.* at 15–16.

We are not persuaded by Appellant's argument that the technical features recited in claim 1 extend beyond a mental process involving a set of instructions for manipulating data to determine a sequence of presenting educational content to a learner, which set of instructions are applied on a computer.[6] *See, e.g.*, Memorandum, fn 14 ("[i]f a claim, under its broadest reasonable interpretation, covers performance in the mind but for the recitation of generic computer components, then it is still in the mental processes category unless the claim cannot practically be performed in the mind") (citations omitted). The Memorandum defines "mental processes" as "concepts performed in the human mind (including an observation, evaluation, judgment, opinion)." Memorandum, 84 Fed. Reg. at 52–53 (footnote omitted)).

We analyze certain limitations of claim 1, individually and as set forth *supra*, in support of our determination that such limitations may be performed in the human mind or with pen and paper. First, the claim limitation, "automatically generating, for each electronic educational content object in the set of electronic educational content objects, metadata for the electronic educational content object that identifies a type of file, from amongst a set of educational-object file types, of the electronic educational

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[6] *See, e.g.*, Transcript 5 (characterizing the claimed invention as "deliver[ing] optimized content to a user device"); *id.* 8–9 (wherein Appellant agrees that the claimed method steps are analogous to a teacher assembling a list of test questions by determining which types of question to include, "in the non-computerized world").

content object," requires classifying data (or content objects[7]) by generating metadata[8] according to file type[9], which may be performed mentally by a content provider[10] (i.e., teacher) using observation, evaluation, judgment, and/or opinion, for example, with the aid of pen and paper. In support, the Specification specifically discloses that metadata "*can be provided by a content provider 105* and/or automatically generated based on provided content objects" Spec. ¶ 16 (emphasis added).

The claim limitation "identifying a target proportion of representation of an educational-item file type in the set of educational-item file types," as set forth *supra*, can be performed in the human mind or with pen and paper,

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[7] Appellant submits that "questions in [a] math test" are examples of objects. Transcript 3; *see also* Spec. ¶ 17 (disclosing that "[c]ontent objects can include documents (e.g., articles, worksheets, or tutorials), presentations webpages and/or media files (e.g., videos, graphics, or audio files)").

[8] An ordinary meaning of the claim term "metadata," consistent with the Specification is "data that provides information about other data." http//www.merriam-webster.com/dictionary/metadata (last visited Mar. 14, 2019); *see also* Spec. ¶ 16 ("each metadata element characteriz[es] an associated content object"); *id.* ¶ 17 ("metadata includes characteristics of an associated content object and can include, e.g., one or more topics (e.g., keywords), a brief summary, a title, a type of object, and/or a skill level"). Appellant submits that the metadata for identifying a type of file may be, for example, "addition, subtraction, multiplication, division," for a math test question object. Transcript 3.

[9] Absent a specific definition for the claim terms "type of file" or "file type" in the Specification, we determine that the file type is the characterization provided by the metadata, for example, a topic, such as mathematics. *See, e.g.*, Spec. ¶ 17.

[10] The Specification discloses that content provider 105 is a person. Spec. ¶ 15 ("a party 105"); thus, we understand that an example of content provider 105 is a teacher.

because a teacher, for example, may mathematically[11] determine the amount (or proportion) of a certain educational-item file type (i.e., content objects with metadata characterizing the content objects as a mathematics file type), in comparison to content objects identified by the metadata as being within file types representative of other subjects (i.e., literature) in the curriculum. *See, e.g.*, Spec. ¶ 35 ("[b]ased on the learner-specific topic availabilities and weights, a target-proportion definer 245 can identify a set of target or desired proportions, where each proportion identifies a target fraction of a sequence devoted to a particular topic," wherein "target sequence proportions can be set by normalizing the weights of those topics relative to the weights' sum").

The claim limitation, "accessing a past sequence of educational-item file types, the past sequence of educational-item file types including a series of identifiers of educational-item file types in the set of educational-item file types," as set forth *supra*, can be performed in the human mind or with a pen and paper, because a teacher may access and mentally review past curriculums (for example, embodied on paper) to determine the representation and presentation sequence of subjects within the past curriculum, including giving consideration to identifiers[12] (or metadata for the file type, which identifies the content object).

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[11] Although claim 1 does not recite an algorithm, it is well established that algorithms are abstract ideas. *See, e.g., Alice*, 134 S. Ct at 2355.

[12] The Specification does not provide a definition for "identifier," and thus, we understand an "identifier" to mean "one that identifies." https://www.merriam-webster,com/dictionary/identifer (last visited Mar. 14, 2009); *see* Spec. ¶ 6 ("[t]he past sequence of topics includes a series of identifiers for topics in the set of educational topics," wherein "an identifier for the educational topic is appended to the past sequence of topics to produce a potential sequence"). Thus, we understand the claimed "series of

The next claim limitation requires performing *a series of steps* "for each educational-item file type in the set of educational-item file types." First in this series of steps, claim 1 requires, as set forth *supra*, "appending an identifier of the educational-item file type to the past sequence of educational-item file types to produce a potential sequence," which step can be performed in the mind or with pen and paper, because a teacher may add or supplement identifiers to subjects presented in a past sequence to create a potential sequence. *See, e.g.*, Spec. ¶ 38 ("[p]otential sequence builder 305 can then construct a set of potential sequences – each including an available topic (or set of available topics) appended to the past sequence," wherein "[i]n some instances, a potential sequence is generated for each available topic").

Next, the series of steps for each educational-item file type, requires, as set forth in claim 1 *supra*, "determining an entropy of the potential sequence," "determining a proportion of the identifiers in the past sequence or potential sequence that identify the educational-item file type," and "determining a score based on the entropy, the proportion and the target proportion for the educational-item file type," each of which are steps that can be performed in the human mind or with pen and paper, because a teacher may mathematically make such determinations without the use of a computer. Determining a proportion, is addressed *supra*. *See also* Spec. ¶ 59 ("proportion-delta engine 310 determines a proportion for the potential topic"). Regarding determining entropy, the Specification discloses using an "algorithm to assess variation in a sequence" (*id.* ¶ 41 ("[t]he entropy can

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identifiers" or "an identifier" to be distinct from metadata identifying the type of file, which provides an additional level of identification.

include a Shannon entropy, which can include a cumulative sum . . . of a product of a probability of a topic occurring in part or all of a sequence and a base-2 log of the probability")). Scoring is disclosed as using "combiner 320 [to] combine the proportion metric and the entropy metric to generate a score," for example, wherein each metric may be normalized and/or weighted. *See, e.g.*, *id.* ¶¶ 44–45.

Regarding the claim step of determining entropy, Appellant relies on *Veracode* for contending that the claims are eligible because it would be extremely difficult or impossible to perform the steps of the method manually.[13] Br. 18 (citing *Veracode, Inc. v. Appthority, Inc.*, 137 F.Supp.3d 17 (D. Mass. 2015)). Appellant argues that "determining an entropy for each of multiple potential sequences and using a pseudo-random selection technique to select an educational content object," when "such actions [arise] in the context of other claim features are – at worst – not possible, and – at best – painful." *Id.* However, unlike *Veracode*, Appellant has not provided persuasive evidence that the process of claim 1 is so complex that performing the steps of the method mentally cannot be done. *See Bancorp Servs., L.L.C. v. Sun Life Assurance Co.*, 687 F.3d 1266, 1278 (Fed. Cir. 2012) ("the fact that the required calculations could be performed more efficiently via a computer does not materially alter the patent eligibility of the claimed subject matter").

[13] *See* Transcript 8 (arguing that, in the claimed method, "there are steps that are specific to a computer, . . . for example assigning metadata and storing it appropriately is not something I could do in my head . . . [o]r delivering content").

Continuing our analysis of whether the claims are directed to a judicial exception, we determine that the claim limitation, "selecting an educational-item file type from amongst the set of educational-item file types based on the determined scores," as set forth *supra*, is a step that can be performed in the human mind or with pen and paper, because a teacher may mentally (and manually) analyze the scores to select the file type, rather than using "topic selection engine 320" as disclosed in the Specification. *See, e.g.*, Spec. ¶ 46.

The claim limitation, "appending the past sequence with the selected educational-item file type, such that the selected educational-item file type is associated with a sequence position in the appended sequence," as set forth *supra*, is a step that can be performed in the human mind or with pen and paper, because a teacher may append the selected file type into the past sequence, for example, by adding the file type into the past curriculum and associating a position within the sequence of file types presented in the curriculum to the selected file type. *See, e.g.*, Spec. ¶ 58 ("[t]he potential sequence can be generated by appending the potential topic to the past sequence").

The claim limitation, "identifying a plurality of electronic educational content objects from amongst the set of electronic educational content objects, each of the plurality of electronic educational content objects being associated with metadata that identifies the electronic educational content object as being of the selected educational-item file type," as set forth *supra*, is a step that can be performed in the human mind or with pen and paper, because a teacher can make such a selection based on the classification of the data (or content objects), as discussed *supra*.

Finally, the claim limitation "using a pseudo-random selection technique to select an electronic educational content object from amongst the plurality of electronic educational content objects," as set forth *supra*, is a step that can be performed in the human mind or with pen and paper, because a teacher may use such a mathematical pseudo-random selection technique, using pen and paper, to select the content objects. *See, e.g.*, Spec. ¶ 63 ("[f]or example, content manager 205 may identify all content objects with a topic weight above a threshold for the selected topic and may then randomly select a content object").

In sum, the Specification supports the Examiner's determination that the above-identified claimed method steps can be accomplished in the human mind or with pen and paper, for example, by a teacher using observation, evaluation, judgment, and/or opinion. Such a determination is not altered by implicitly claiming algorithms and/or by applying the mental process by claiming generic computing components.[14]

Notably, the present claims are similar to the claims analyzed in *CyberSource Corp. v. Retail Decisions Inc.*, 654 F.3d 1366 (Fed. Cir. 2011); *see also Synopsys, Inc. v. Mentor Graphics Corp.*, 839 F.3d 1138, 1146–47

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[14] Notably, independent claim 1, as originally filed, did not require computing components; rather, the following claim terms were added by amendments: "electronic educational content objects," "electronic presentation," "electronic educational questions" and "electronic presentation" (Amendment dated July 23, 2015); "file," as in ""educational-item file type" (Amendment dated August 26, 2015 (with a statement that "[n]o new matter is added by these amendments" on page 11)); and the recitation of "a server" and the steps of "automatically generating . . . metadata," "transmitting the electronic educational content objects from the server, over the network and to an electronic device" (Amendment dated January 5, 2016).

(Fed. Cir. 2016) ("While the Supreme Court has altered the § 101 analysis since *CyberSource* in cases like *Mayo* and *Alice*, we continue to 'treat [ ] analyzing information by steps people go through in their minds, or by mathematical algorithms, without more, as essentially mental processes within the abstract-idea category.'" (quoting *Elec. Power Grp. v. Alstom S.A.*, 830 F.3d 1350, 1354 (Fed. Cir. 2016)). In *CyberSource*, claim 3, for example, of the patent at issue, involved a method for verifying the validity of a credit card transaction over the Internet, comprising the steps of (a) obtaining information about other transactions that have utilized an Internet address that is identified with the credit card transaction, (b) constructing a map of credit card numbers based upon the other transactions; and (c) utilizing the map of credit card numbers to determine if the credit card transaction is valid. *See CyberSource* at 1370.

The Court in *CyberSource* determined, with respect to step (a), that "[t]he Internet is merely described as the source of the data" and also that mere data-gathering steps cannot make an otherwise nonstatutory claim statutory. *Id.* (citing *In re Grams*, 888 F.2d 835, 840 (Fed. Cir. 1989); *see also id.* at 1371 ("even if some physical steps are required to obtain information from the database (e.g., entering a query via a keyboard, clicking a mouse), such data-gathering steps cannot alone confer patentability" (citation omitted)). Regarding step (b), the Court determined that "a person may 'construct[] a map of credit card numbers' . . . by writing down a list of credit card transactions made form a particular IP address." *Id.* at 1372 (citation omitted). The Court concluded that "[a]ll of claim 3's steps can all be performed in the human mind," and that "such a method that can

be performed by human thought alone is merely an abstract idea and is not patent-eligible under § 101." *Id.* The Court explained that

> [m]ethods which can be performed entirely in the human mind are unpatentable not because there is anything wrong with claiming mental method steps as part of a process containing non-mental steps, but rather because computational methods which can be performed *entirely* in the human mind are the types of methods that embody the "basic tools of scientific and technological work" that are free to all men and reserved exclusively to none.

Id.

Similar to step (a) of claim 3 in *Cybersource*, the step of claim 1 *supra* requires automatically generating metadata for each electronic educational content object involves gathering and classifying data, notwithstanding recitation of a network, the *automatic* generation of data, electronic content, metadata, files, and identifiers. Similar to step (b) of claim 3 in *Cybersource*, the steps of claim 1 *supra* that require (paraphrased) identifying a target proportion, accessing a past sequence, and for each educational-item file type: appending an identifier to produce a potential sequence, and determining an entropy for the potential sequence, a proportion of the identifiers for the past or potential sequences, and a score; and further, selecting an educational-item file type based on the score, appending the past sequence with the selected educational-item file type, identifying content objects of the selected educational-item file type, and using a pseudo-random selection technique to select an electronic educational content object—similar to the construction of the map in *Cybersource*—may be performed by a teacher, as discussed *supra*.
In other words, as in *Cybersource*, claim 1 as set forth *supra*, is a method that can be performed by human thought alone (albeit applied on a

computer), and therefore, recites an abstract idea, not patent-eligible under § 101.

Thus, claim 1 recites an abstract idea, within the subject matter grouping of mental process, because claim 1 involves a set of instructions for manipulating data to determine a sequence of presenting educational content to a learner, which may be performed in the mind and/or with pen and paper.

Step 2A, Prong 2, of the Memorandum: Do additional elements integrate the exception into a practical application of the exception?

Next, in accordance with the Memorandum, we evaluate whether the claim as a whole integrates the mental process into a practical application of the mental process by identifying whether there are any additional elements recited in the claim beyond the judicial exception, and evaluating those additional elements individually and in combination to determine whether they integrate the exception into a practical application. Memorandum, 84 Fed. Reg. at 54–55.

Two *additional* claim elements, reproduced below, are omitted from our analysis under Step 2A, Prong 1, because the elements are *not* steps in a mental process (i.e., cannot be performed mentally).

> receiving, at a server and via one or more uploads from one or more content-provider devices, a set of electronic educational content objects, each electronic educational content object in the set of electronic educational content objects, the server being connected to each of the one more content provider devices via a network;
>
> . . .
>
> transmitting the electronic educational content object from the server, over the network and to a learner electronic device so

> as to facilitate an electronic presentation of the electronic educational content object at the learner device after a presentation of one or more other electronic content objects associated with sequence positions before the sequence position in the appended sequence.

Appeal Br. 20–21 (Claims App.). We determine that these limitations simply use a computer (i.e., server, network, learner electronic device, computing components for the electronic presentation and manipulation of electronic files, and electronic data) as a tool to apply the mental process, and further, represent insignificant extra-solution activity. In other words, the claimed mental process is "for determining sequences for electronic presentation of electronic educational content objects," and the steps of receiving at a server uploads of the content objects to begin the claimed process and transmitting content to a learner electronic device to end the claimed method is insufficient to confer patent eligibility. *See, e.g.*, *Parker v. Flook*, 437 U.S. 584, 590 (step of adjusting an alarm limit based on the output of a mathematical formula was 'post-solution activity' and did not render method patent eligible).

Appellant argues that "[s]imilar to the claims at issue in *Enfish*, the pending claims provide a specific improvement in the way computers operate as an improvement in an existing technological process." Br. 15. More particularly, Appellant submits that

> [t]he present claims address a problem specifically arising in computer technology, which is to identify a file type of an electronic educational content object to be presented. The claims then set forth a detailed ordered combination of actions through which this problem is addressed, which involves detections and processing based on file-type metadata. Further yet, a part of this processing involves a determination of entropy of multiple

> potential sequences (which is, in practice, a very complex calculation) and using a pseudo-random selection technique.

Id. at 16; *see also* Transcript 10 (arguing that "it's in the intake of the content being received from a computer device," "classification," and "delivery of that content that provides that practical application").

As stated in the Memorandum, whether an additional element reflects an improvement in the functioning of a computer is a consideration indicative that the additional element may have integrated the exception into a practical application. Memorandum, 84 Fed. Reg. at 55. However, the Memorandum also recognizes that "[t]he courts have also identified examples in which a judicial exception has not been integrated into a practical application," for example, when "[a]n additional element merely recites the words 'apply it' (or equivalent) with the judicial exception, or merely includes instructions to implement an abstract idea on a computer, or merely uses a computer as a tool to perform an abstract idea." *Id.* (citations omitted). In other words, claim 1 addresses interleaving teaching topics to provide variation to a learner, but does not solve a problem arising in computer technology. *See, e.g.*, Spec. ¶ 3; *see Intellectual Ventures I LLC v. Symantec Corp.*, 838 F.3d 1307, 1318 (Fed. Cir. 2016) ("with the exception of generic computer-implemented steps, there is nothing in the claims themselves that foreclose them from being performed by a human, mentally or with pen and paper").

Appellant also appears to argue that the claims integrate the mental process into a practical application as an improvement to a technology or technological field *other than the functioning of a computer* (*see, e.g.*, Memorandum 55), for example, improving "the technological process of

providing ongoing educational content electronically to a learner in a proportion and variety necessary to keep the learner engaged while encouraging mastery of the necessary subject matter." Br. 16. However, aside from the computing components—and considering claim 1 as a whole, there is no integration of the abstract idea, only the mental process itself (i.e., a set of instructions that can performed mentally).

Appellant further argues that the claims, "similar to the claims found to be patent-eligible in *Bascom*, 'do not preempt the use of the abstract idea' . . . , but rather recite 'a specific, discrete implementation of the abstract idea." Br. 19 (citation omitted). However, we determine that specifically claiming a unique process without foreclosing other methods to solve the problem is necessary but not sufficient for patent-eligibility. *See, e.g.*, *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371, 1379 (Fed. Cir. 2015 (holding that "[w]hile preemption may signal patent ineligible subject matter, the absence of complete preemption does not demonstrate patent eligibility" and that "[w]here a patent's claims are deemed only to disclose patent ineligible subject matter under the *Mayo* framework, . . . preemption concerns are fully addressed and made moot").

In sum, we determine that the additional limitations analyzed *supra* fail to integrate the mental process (i.e., abstract idea) into a practical application of the judicial exception.

Step 2B of the Memorandum: If the claim is directed to a judicial exception, evaluate whether the claim provides an inventive concept

The Memorandum explains that "[i]t is possible that a claim that does not 'integrate' a recited judicial exception is nonetheless patent eligible," for

example, because "the claim may recite additional elements that render the claim patent eligible even though a judicial exception is recited in a separate claim element." Memorandum, 84 Fed. Reg. at 56. In other words, "the additional elements recited in the claims provided 'significantly more' than the recited judicial exception (*e.g.*, because the additional elements were unconventional in combination)." *Id.*

Appellant argues that "the combination of elements in the claims amount to an inventive step." Br. 16 (citing *Bascom Global Internet v. AT&T Mobility LLC*, 827 F.3d 1341 (Fed. Cir. 2016)); *see also* Transcript 7 (arguing that that, similar to examples 38 and 39 accompanying the Memorandum, the claimed combination of steps that involve the gathering of data include an inventive concept, because the steps are performed in an unconventional way). In particular, Appellant submits that "the present claims provide an individualized solution to each learner just as the filtering was individualized in *Bascom*," and that "[t]he electronic educational content provided to the learner in the present claims provide a highly specific solution tailored to particular file-type data and target proportion, such that variability and proportionality can be promoted in a variety of particular learning contexts." *Id.* at 17. Appellant submits that the Examiner has not rejected the claims pursuant to 35 U.S.C. §§ 102, 103, which is evident the claims amount to significantly more than the judicial exception. *Id.* at 18–19.

The features that Appellant identifies as "significantly more," i.e., determining entropy, proportion, and a score for selecting educational content and presenting the content to a learner, are, however, part of the abstract idea itself, i.e., mental processes. As such, these claim limitations

cannot constitute the "inventive concept." *Berkheimer v. HP, Inc.*, 890 F.3d 1369, 1374 (Fed. Cir. 2018) (Moore, J., concurring) ("It is clear from *Mayo* that the 'inventive concept' cannot be the abstract idea itself, and *Berkheimer* . . . leave[s] untouched the numerous cases from this court which have held claims ineligible because the only alleged 'inventive concept' is the abstract idea."); *see also BSG Tech. LLC v. BuySeasons, Inc.*, 899 F.3d 1281, 1290 (Fed. Cir. 2018) ("Our precedent has consistently employed this same approach. If a claim's only 'inventive concept' is the application of an abstract idea using conventional and well-understood techniques, the claim has not been transformed into a patent-eligible application of an abstract idea.").

Accordingly, we sustain the Examiner's rejection of independent claim 1, and claims 2–4, 7–11, 14–18, 22, and 24–28 fall therewith.

DECISION

The Examiner's rejection of claims 1–4, 7–11, 14–18, 22, and 24–28 under 35 U.S.C. § 101 is AFFIRMED.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED